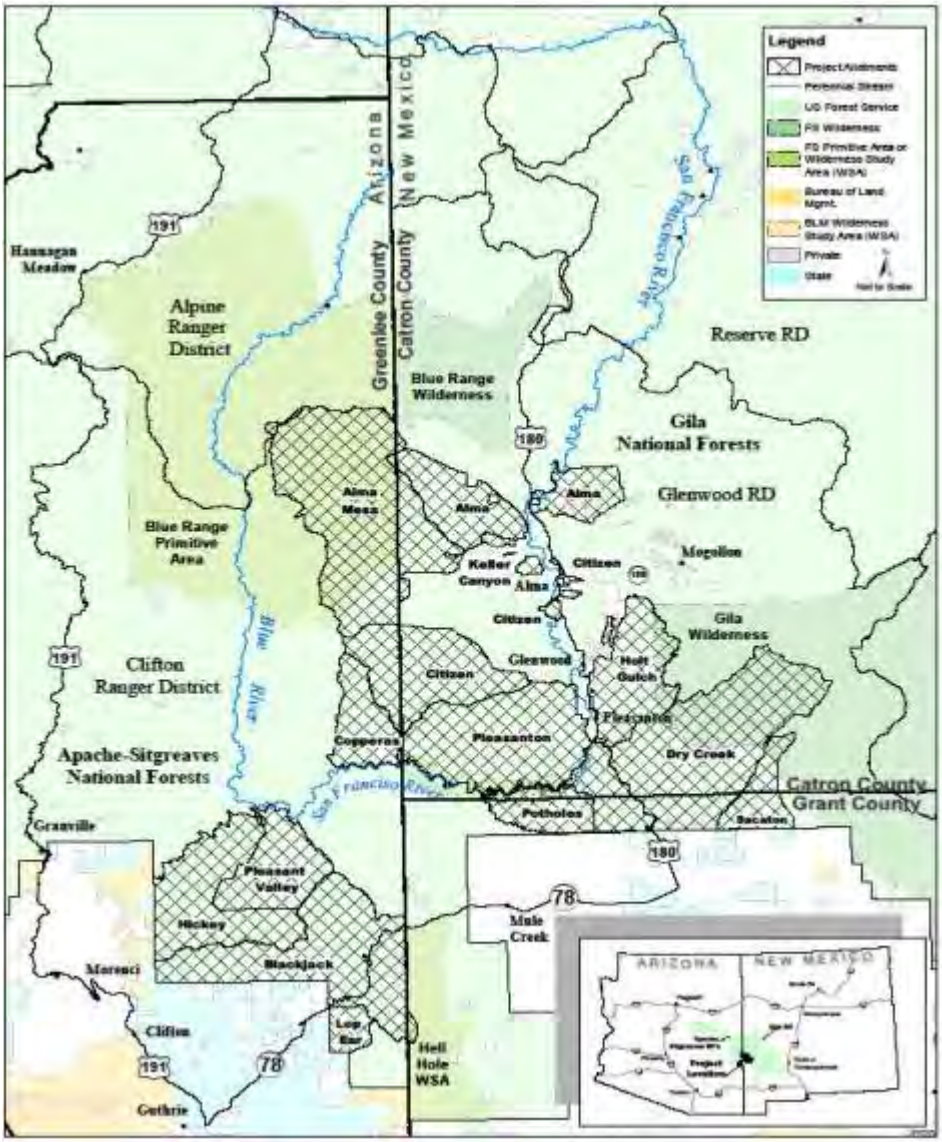
United States Department of Agriculture

Stateline Range NEPA

Environmental Assessment



Forest Service

Apache-Sitgreaves and Gila National Forests

June 2019

Clifton and Glenwood Ranger Districts

For More Information Contact:

Kent Ellett
Clifton Ranger District,
Apache-Sitgreaves National Forest
397240 AZ Hwy 75
Duncan, AZ 85534
Phone: 928-687-8612
Email: kent.ellett@usda.gov

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident. Persons with disabilities who require alternative means of communication for program information (for example, Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at http://www.ascr.usda.gov/complaint_filing_cust.html and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.

We make every effort to create documents that are accessible to individuals of all abilities; however, limitations with our word processing programs may prevent some parts of this document from being readable by computer-assisted reading devices. If you need assistance with this document, please contact the Clifton Ranger District, Apache-Sitgreaves National Forest at 928-965-4150.

Contents

List of Tables

List of Figures

Introduction

The Clifton Ranger District of the Apache-Sitgreaves National Forests and the Glenwood Ranger District of the Gila National Forest are proposing to authorize ongoing grazing on the following 14 allotments:

- Apache-Sitgreaves National Forests: Alma Mesa, Blackjack, Copperas, Hickey, Keller Canyon, Lop Ear, and Pleasant Valley.
- Gila National Forest: Alma, Citizen, Dry Creek, Holt Gulch, Pleasanton, Potholes, and Sacaton.

This environmental assessment has been prepared to determine whether implementation of authorizing the grazing activities may significantly affect the quality of the human environment and thereby require the preparation of an environmental impact statement. This environmental assessment is prepared in compliance with the National Environmental Policy Act. It discloses the direct, indirect, and cumulative impacts that would result from the proposed action and one other alternative – the no-action alternative. Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record.

Proposed Project Area Location and Description

The project area covers allotments located along or near the state line between Arizona and New Mexico, on the Apache-Sitgreaves and Gila National Forests (figure 1). The project area covers approximately 271,665 acres with 126,243 acres in Arizona and 145,422 acres in New Mexico.

Six allotments occur primarily in Arizona and eight occur primarily in New Mexico, with portions of six allotments extending across the state line. Elevations range from 4,400 feet near Clifton, Arizona to approximately 10,491 feet in the Gila Mountains in New Mexico.

Permitted numbers vary from 3,791 to 4,022 head of cattle and horses, depending on the time of year, for a total of 45,462 animal unit months[1] currently permitted through term grazing permits or authorized per decision notices on these allotments. Two of the allotments are used seasonally during parts of the year while twelve are permitted for year-round use, rotating use through pastures at various lengths of time and time of year and with varying numbers.

The dominate vegetation types for these allotments are juniper and pinyon woodlands and grasslands. Some allotments, such as Alma Mesa, Dry Creek, and Holt Gulch, have stringers or areas dominated by ponderosa pine and Douglas fir.

The San Francisco River runs through, or adjacent to, 10 of the 14 allotments.

[1] An animal unit month is a measure of the amount of forage required by a 1,000-pound cow or its equivalent for one month based on a daily allowance of 26 pounds dry forage per day. It is not synonymous with animal month or head-month, which is an expression of one month's occupancy of the range by an animal. For calculating animal unit months and for conversion factors, a dry cow or a cow-calf pair is considered 1.0 animal unit months, a yearling is 0.7 animal unit months, a bull is 1.5 animal unit months, and a horse is 1.2 animal unit months.

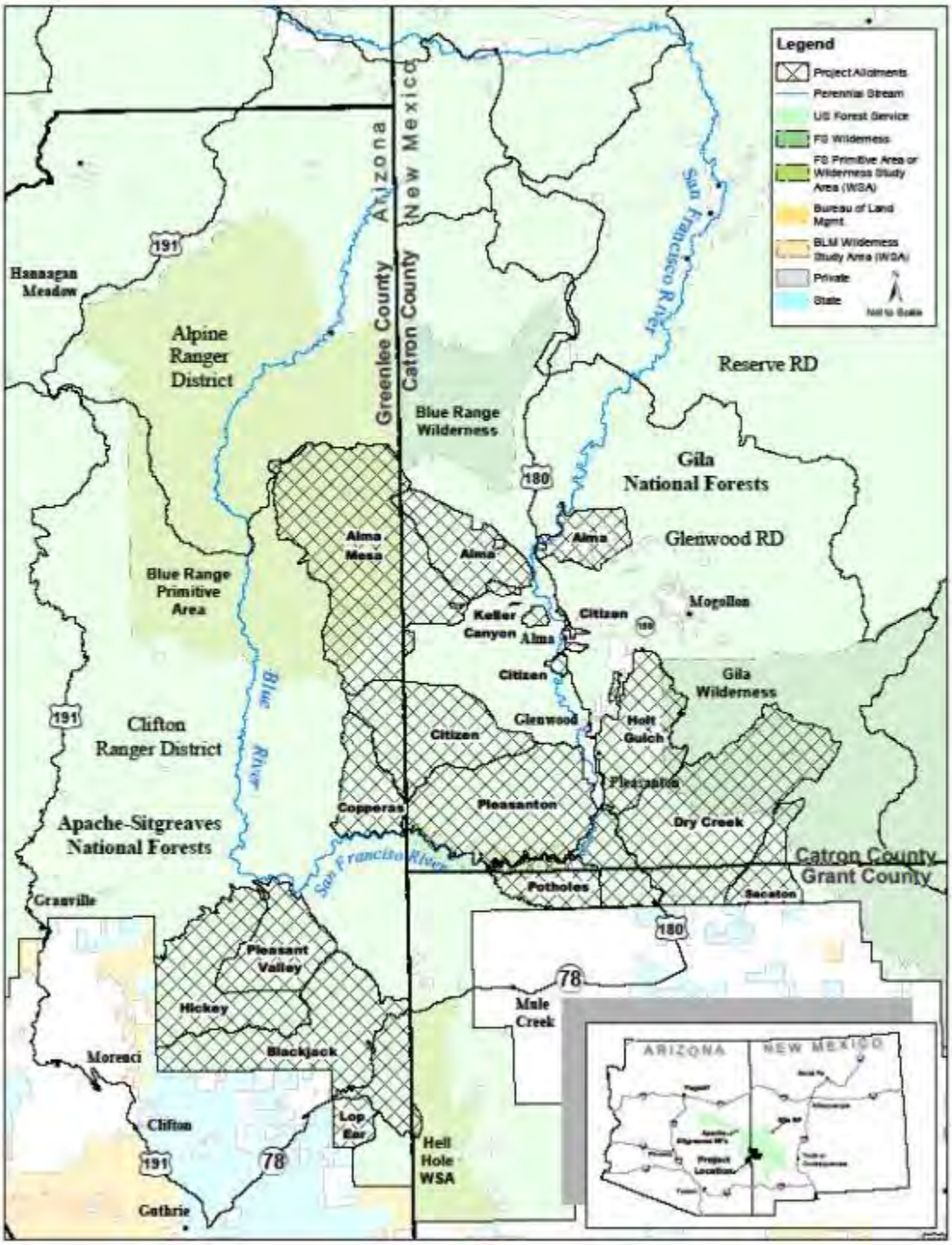


Figure 1. Vicinity map

The project area includes portions of the Blue Range Primitive Area and portions of the Gila Wilderness and the Blue Range Wilderness. There are approximately 79,990 acres of inventoried roadless area within the project area, including the Hell Hole, Lower San Francisco, Mitchell Peak, and Sunset Inventoried Roadless Areas.

Developed recreation facilities occur on 5 of the allotments, including 2 developed campgrounds and kiosks or information boards at 5 of the 12 trailheads. There are approximately 121 miles of National Forest System trails within the project area: approximately 65 miles on the Apache-Sitgreaves National Forests and 56 miles on the Gila National Forest.

Within the project area, there are 90 recorded cultural resource sites in Arizona and 261 in New Mexico.

Five endangered and 6 threatened species occur or are expected to occur within or adjacent to the project area. Another 26 sensitive species either occur or their habitat is present within the project area and therefore there is the potential for them to occur.

Management Direction

Where consistent with other multiple use goals and objectives, there is congressional intent to authorize livestock grazing in a sustainable manner while managing for other resource benefits as discussed in multiple acts such as, but not limited to, the Organic Administration Act of 1897 (16 U.S.C. 473-475), Bankhead-Jones Act of 1937, Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Endangered Species Act of 1973, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, and National Forest Management Act of 1976, and the 1972 Federal Clean Water Act as amended in 1977 and 1987.

Forest Service Manual 2201 summarizes laws and regulations governing range management and forest planning. Forest Service Manual 2600 provides direction for federally listed species and for wildlife, fish, and sensitive plant habitat management.

Public Law 104-19, section 504 from the 1995 Rescissions bill directs the Forest Service to complete site-specific environmental analyses and decisions on allotments on a scheduled basis.

36 CFR 222.3(a) states that unless otherwise specified by the Chief of the Forest Service, all grazing and livestock use on National Forest System lands must be authorized by a grazing or livestock use permit

By federal regulation, forage-producing lands will be managed for livestock grazing consistent with land management plans (36 CFR 222.2 (c)), the Clean Water Act, and the Endangered Species Act, as amended.

The 1918 Migratory Bird Treaty Act established an international framework for the protection and conservation of migratory birds. The Bald Eagle Protection Act of 1940, amended in 1972, provides for the protection of the bald eagle and the golden eagle.

The National Historic Preservation Act of 1966, section 106 in particular, governs how agencies consider the effects of their undertakings to properties included in, or eligible for inclusion in, the National Register of Historic Places.

The Wilderness Act of 1964 (Public Law 88-577) governs the management of wilderness areas, whereas the congressional grazing guidelines (excerpt from Public Law 101-628 section 101(f)) provides congressional guidelines and intent related to livestock grazing in wilderness areas.

Federal Noxious Weed Act of January 3, 1975 authorizes the Secretary of Agriculture to (1) designate plants as noxious weeds by regulation; (2) prohibit the movement of such weeds in interstate or foreign commerce except under permit; (3) inspect, seize and destroy products, and quarantine areas if necessary to prevent the spread of such weeds; and (4) cooperate with other Federal, State and local agencies, farmers associations, and private individuals in measures to control, eradicate, prevent, or retard the spread of such weeds.

The Southwestern Region supplement to Forest Service Handbook 2209.13[2] provides clarification and direction for administering grazing permits and decision making through the environmental analysis process.

Further guidance and direction is provided at the Forest level through land and resource management plans (forest plans). The Apache-Sitgreaves forest plan was approved in August 2015 and revised in October 2016. It provides management direction for the project area in Arizona. The 1986 Gila forest plan, as amended, provides direction for the project area in New Mexico.

Purpose and Need for the Proposal

Where consistent with the goals, objectives, standards, and guidelines of the Apache-Sitgreaves and Gila forest plans, Forest Service personnel may make forage from lands suitable for grazing available to qualified livestock operators. This is also in accordance with the Multiple Use and Sustained Yield Act of 1960 and the Forest and Rangeland Renewable Resources Planning Act of 1974.

Recent monitoring indicates vegetation, soil, and riparian resource conditions within the project area are largely meeting or moving toward forest plan goals, objectives, standards, and guidelines. However, some areas are not currently meeting forest plan direction. Also, some changes to current management practices could improve resource conditions or better ensure current conditions and trends are maintained.

The purpose for this project is to:

- authorize livestock grazing on the Apache-Sitgreaves and Gila National Forests in a manner that maintains or improves project area resource conditions and achieves the objectives and desired conditions described in the forest plans; and
- provide long-term management direction on grazing through allotment management plans, including the permitted numbers and class of livestock, season of use, facilities associated with livestock grazing, allowable forage utilization levels, and associated permit clauses.

The need for this project is to:

- meet the requirements of the Rescissions Act of 1995 (Public Law 104-19), section 504, which requires that all range allotments undergo National Environmental Policy Act analysis;

[2] Grazing Permit Administration Handbook, Chapter 90 Rangeland Management Decision making - Supplement Number 2209.13-2016-1,

- maintain or improve current satisfactory resource conditions and to improve those areas in unsatisfactory conditions to move toward desired conditions; and
- incorporate management flexibility through an adaptive management strategy consistent with Forest Service policy (Forest Service Handbook 2209.13, chapter 90) to adapt management to changing resource conditions or management objectives.

Existing Conditions

For rangeland vegetation, monitoring data (for example, ground cover, amount of litter, and amount and composition of plants) indicates most of the project area is in satisfactory condition, with upward or stable trends. Of the 69 range transects surveyed, one indicates a static to slightly downward trend, 28 (41 percent) indicate a static trend, and 40 (58 percent) indicate an upward trend (table 3 and table 4).

The ground cover indicators reflect an improvement in site protection since the 1950s and 1960s with an overall decrease in bare soil. For ground cover, one transect indicates a static to slightly downward trend, 13 (19 percent) indicate a static trend, and 55 (80 percent) indicate an upward trend. (table 6 and table 7).

For riparian areas, of the 51 reaches surveyed, 43 were determined to be properly functioning, in satisfactory condition and meeting forest plan standards and guidelines. Two reaches were functioning at risk with an upward trend. While these two reaches are not in satisfactory condition at this time, they are moving toward forest plan standards and guidelines. Six reaches were determined to be functioning at risk with no apparent trend, in unsatisfactory condition and are not meeting or moving towards forest plan standards and guidelines.

Desired Conditions

Management direction from the two forest plans are incorporated by reference. Desired conditions are aspirational. They are descriptions of goals to be achieved at some time in the future. They are normally expressed in general terms and are timeless in that they do not have a specific date to be completed. They are not synonymous with potential conditions which is the lands ability to produce certain resources, goods, and services.

The desired conditions for the allotments in this project area are to move towards and eventually achieve the following:

- Watershed and soil conditions are either being maintained at or are improving towards a satisfactory rating where the potential exists. A satisfactory condition rating denotes soils and watershed attributes are functioning properly and normally. Resource values that depend on soil and watershed functionality are being adequately maintained and desired vegetative outputs are being produced within the natural range of variability for the potential vegetation type.
- Rangeland and watershed conditions that are stable or improving. Rangeland conditions are considered stable or improving when species composition and site protection indicators (such as ground cover) are similar to what is expected for the site based on the current understanding of plant community dynamics, or are trending upward.
- Habitat conditions contribute to the recovery of federally listed species.

- Riparian zones are maintained at or improving to properly functioning condition.
- Cultural resources are not negatively impacted by livestock grazing and associated activities.
- Livestock grazing activities contribute to the social, economic, and cultural diversity and stability of rural communities.

Public Involvement and Tribal Consultation

The project was first published on the schedule of proposed actions in 2016 with periodic updates published quarterly.

On December 15, 2017, a scoping notice was mailed to 277 contacts, including 181 individuals, groups, and organizations; 22 elected officials; 39 tribal members; and 35 agency and government entities. A total of twenty comments were received in response to the scoping notice. As a follow-up, Clifton Ranger District personnel met with the Arizona Game and Fish Department personnel and as requested, the project team leader met with the Sierra Club members and an interested individual.

Personnel on the Apache-Sitgreaves and Gila National Forests coordinated with the permittees that run livestock on the allotments regarding existing and desired conditions, possible practices, and design features that could improve management. At their request, two on-the-ground sites visits were conducted: one with an adjacent landowner to the Dry Creek allotment and one with a member of the Sierra Club on the Blackjack, Hickey, and Pleasant Valley allotments.

A 30-day opportunity to review and comment about the preliminary environmental assessment was provided on October 3, 2018 and again on October 31, 2018. In response, the two forests received responses from over 12,000 commenters. The majority of the comments were form letters or form letters with additional comments added. There were 1,448 duplicate letters and 74 letters not associated with form letters.

Tribal

On December 12, 2017, a letter and scoping notice was sent to the following tribes: Alamo Navajo Chapter, Mescalero Apache Tribe, Pueblo of Acoma, The Hopi Tribe, Hualapai, White Mountain Apache Tribe, Fort Sill Apache Tribe, Pueblo of Laguna, Ramah Navajo Chapter, The Navajo Nation, San Carlos Apache Tribe, Tonto Apache Tribe, Yavapai-Apache Nation, Yavapai Nation, Yavapai-Prescott Tribe, Ysleta Del Sur Pueblo and Pueblo of Zuni. Responses were received from the Hopi, Ysleta del Sur Pueblo, and White Mountain Apache Tribes.

On October 1, 2018 and again on October 31, 2018, a letter was sent to these same tribes notifying them of the opportunity to review and comment about the preliminary environmental assessment.

As a result of these coordination efforts, several issues and topics of concern were identified as follows:

- Soil and watershed: There is concern for sections of riparian areas not in proper functioning condition and what measures will be taken to help them achieve proper functioning condition. There is concern about ensuring the continued exclusion of livestock grazing from excluded areas, such as the San Francisco River corridor, and considering if other riparian areas should be excluded from livestock use.

- Range resources: Managing grazing levels in balance with available forage, providing for satisfactory conditions, and providing the flexibility for management to respond to changing conditions.
- Wildlife, predominantly threatened and endangered species: Managing livestock grazing activities so they do not adversely affect wildlife, particularly federally listed species and other riparian-dependent species.
- Cultural: Protecting archaeological properties with historical or cultural importance.
- Recreation: Addressing possible effects to dispersed and developed camp sites and general recreational activities.
- Special management areas: For grazing management to maintain wilderness and primitive area values and consider their unique and special characteristics.
- Socioeconomic resources. The suitable amount, locations, and kinds of structural improvements necessary to properly manage livestock grazing while considering costs, cost apportionment, and maintenance needs. Several commenters on the preliminary environmental assessment also identified potential social and economic impacts as an issue. In response, a summary of socioeconomic consequences is included in this final environmental assessment.

As a result of the public involvement and coordination efforts, the proposed action was modified or in some instances, greater clarification has been added. The comments received did not result in the need to create additional alternatives to the no-action alternative and the proposed action.

Proposed Action and Alternatives

Alternative 1 – No Action, No Grazing

Instead of a no-action alternative that would be the continuance of current management practices, Forest Service policy (USDA Forest Service 2016) requires no grazing as the no-action alternative. Therefore, the no-action alternative would be a change from the existing environmental setting which currently includes livestock grazing on each allotment.

This alternative would eliminate livestock grazing on the National Forest System lands within the project area; no new term grazing permits for livestock grazing would be issued, resulting in a 100 percent reduction in the existing permitted livestock use. Grazing permits on lands that are to be devoted to another public purpose may be canceled following 2-year prior notification (36 CFR 222.4(a)(1)).

Range improvements such as interior fences, corrals, water lots, pipelines, and troughs would be removed as time and funding permits. Water developments beneficial to wildlife and recreational stock may be retained if funding is secured for maintenance by benefiting program areas or through cooperative volunteer programs. Where necessary, maintenance of allotment boundary fences would be reassigned to adjacent permittees.

Alternative 2 – Proposed Action

The proposed action is to authorize continued livestock grazing on the allotments listed above, with modifications to address identified management issues. The overall permitted number would be for 3,808 to 3,838 head of cattle and horses (depending on the season) for 44,186 animal unit months which would be a decrease of 1,276 from current permitted numbers.

The proposed action consists of management practices, authorizations, improvements, design features, and monitoring. The proposed action incorporates an adaptive management strategy and sets sideboards for managing livestock use including maximum permitted numbers and class of livestock, timing, intensity, duration, and frequency of grazing along with associated structural improvement needs in accordance with Forest Service handbook direction. Existing range improvements would continue to be assigned improvement numbers and they would be maintained and used except for those identified below for proposed removal.

Management Practices and Design Features

The proposed action incorporates an adaptive management strategy that provides flexibility to adapt management to changing circumstances. Adaptive management stems from the recognition that knowledge about natural resource systems is sometimes uncertain.

Adaptive management is a structured, cyclical process for planning and decision making in the face of uncertainty and changing conditions, including climate change, with feedback from monitoring. The adaptive management strategy would give the responsible official flexibility for unplanned events. It uses the documented results (monitoring) and provides flexibility to make adjustments. Some adaptive management options include, but is not be limited to, administratively adjusting the annual stocking rates, the specific dates for grazing, class of animals, constructing or removing cross fences, developing water and modifying pasture rotations.

Adaptive management includes monitoring to determine whether structural improvements are necessary, need to be modified, or installed. The alternative includes a number or new improvements. Minor changes may be implemented as needed, such as a short fence or pipeline extension or the addition of a tough or storage tank to an existing water system. Any new structural improvements would have heritage and biological clearances completed prior to implementation and all forest plan standards and guidelines would be followed.

Actual use typically varies from permitted numbers. However, except on a trial basis, actual numbers, timing, intensity, duration, and frequency of use would stay within the permitted sideboards and not exceed the limits authorized in this environmental analysis and decision (USDA Forest Service 2015). Administrative changes may be documented and implemented in the annual operating instructions, allotment management plan, term grazing permit, memorandum of understanding, memo to file or some combination of these documents.

Timing, Duration, and Season of Use

The permitted grazing season for each allotment would be yearlong with the following exceptions:

- Sacaton allotment – The grazing season for this allotment would be from December 1 through June 30.
- Alma Mesa allotment – The Alma Mesa allotment would have a yearlong grazing season, but the Bear Valley pasture within the allotment would be restricted to dormant season use between October 1 and April 30.
- Blackjack allotment – The Blackjack allotment would have a yearlong grazing season, but the two Coal Creek pastures would be restricted to dormant season use between November 1 and March 1. The Mesquite Flat pasture (currently in the Pleasant Valley allotment) would typically be used in the fall.

The duration and season of grazing use for individual pastures would vary annually to provide periodic growing season rest or deferment. Typically pastures would be used for a few months at a time, followed by longer rest periods with livestock not reentering a pasture until after the grass has time to set seed or adequately recover.

The timing of grazing may also vary to provide sufficient rest, particularly following drought or fire events. Sufficient rest is typically the amount of time needed for grasses to fully grow and set seed following a grazing or fire event. However, under some circumstances, longer rest periods may be needed depending on the weather, level of use, fire severity, or other disturbance event.

Timing and frequency of pasture use would be determined by, but not limited to, utilization levels, forage conditions, water availability, herd management, previous season of use, expected future use and management objectives specified in the allotment management plan. Pasture moves would be planned with the permittee's input each year through the development of annual operating instructions. Annual operating instructions may be modified as needed during the year to address changing conditions.

Intensity of Grazing

Under the proposed action, the utilization standards would be consistent for each allotment within the project area (table 1). Currently the utilization standards differ between allotments (table 2).

Table 1. Proposed utilization standards for the allotments within the project area

Allotment	Proposed Utilization Standards (Grazing Intensity)
Alma Mesa, Blackjack, Copperas, Hickey, Keller Canyon and Lop Ear Pleasant Valley Alma, Pleasanton and Potholes Citizen Dry Creek and Holt Gulch Sacaton	Conservative use (31 to 40%) on upland and riparian herbaceous and browse species. Conservative use (31 to 40%) on riparian woody species in areas that are properly functioning. Light to non-use (0 to 30%) on riparian woody species in areas that are not functioning properly. Within southwestern willow flycatcher and western yellow-billed cuckoo suitable habitat, average utilization would not exceed 35 percent of palatable, perennial grasses and grass-like plants in uplands and riparian habitats. Woody utilization would not exceed 40 percent on average.

Table 2. Current utilization standards for the allotments within the project area

Allotment	Current Utilization Standards
Alma Mesa, Blackjack, Copperas, Hickey, Keller Canyon and Lop Ear	35 to 45% use of key species
Pleasant Valley	35 to 40% during the growing season, 40 to 45% during the dormant season
Alma, Pleasanton and Potholes	Conservative use (31 to 40%)
Citizen	Conservative (31 to 40%) for upland forage species and limit use of riparian woody species to conservative use or no more than 25% of current year's growth
Dry Creek and Holt Gulch	Conservative (31 to 40%) and not more than 25% of riparian woody sprouts, seedlings, and saplings in a riparian reach heavily hedged
Sacaton	35% on upland herbaceous forage species[3]

Grazing intensity is measured by the utilization of palatable herbaceous forage plants. Grazing intensity on woody browse is typically measured by percent leaders browsed below 6 feet on trees and shrubs.

In the uplands, forage utilization guidelines for both herbaceous and browse species would be managed at a level corresponding to conservative intensity levels[4] within a range of 31 to 40 percent use by weight. In riparian areas, forage utilization guidelines for both herbaceous and browse species would also be managed at conservative intensities, ranging from 31 to 40 percent in those reaches that are in proper functioning condition. For reaches not functioning properly, utilization would be limited to a light to non-use level of 0 to 30 percent until proper functioning condition is obtained.

Within southwestern willow flycatcher and yellow-billed cuckoo suitable habitat, average utilization would not exceed 35 percent of palatable, perennial grasses and grass-like plants in uplands and riparian habitats and woody utilization would not exceed 40 percent on average. Utilization is expressed in terms of the current year's production removed and therefore is measured at the end of the growing season. Utilization of key forage species may be monitored through a pasture-wide reconnaissance or measured in key areas or critical areas.[5] Upland key areas are to represent management effectiveness over the entire pasture and are generally not located near water, roads, or bed grounds but should be in areas that receive substantial use. Upland key areas are usually at least ¼ mile from water and located on productive soils where grazing use would occur.

[3] Note: Per annual operating instructions for the Sacaton allotment, utilization levels for riparian woody species on Sacaton Creek have been to not exceed 25 percent heavily hedged through 2015 followed by not to exceed 25 percent use of woody riparian shoots and sprouts beginning in 2016.

[4] Guidelines for grazing intensity incorporates R3 Supplement Forest Service Handbook 2209.13-2016, Principles of Obtaining and Interpreting Utilization Data on Rangelands, and Interagency Technical Reference 1734-3 Utilization Studies and Residual Measurements and associated references.

[5] Key area - A relatively small portion of a range selected because of its location, use, or grazing value as a monitoring point for grazing use. It is assumed properly selected key areas will reflect the overall acceptability of current grazing management over the range (Society for Range Management 1998).

Critical area - An area treated with special consideration because of inherent site factors, size, location, condition, values, or significant potential conflicts among uses (Society for Range Management 1998).

Seasonal utilization is the amount of use that occurs before the end of the growing season. Seasonal utilization measurements are not used for compliance monitoring with meeting utilization guidelines but may be useful when combined with other information to determine the appropriate times to move livestock to another pasture while evaluating other resource needs. Consistent patterns of utilization in excess of utilization standards would be used as a basis to modify management practices or take administrative actions necessary to reduce utilization in subsequent grazing seasons.

Stubble height standards may be used in lieu of utilization measurements. Targeted stubble heights would correspond to the light and conservative intensity levels described above.

Livestock Management

Consistent with Forest Service Handbook 2209.13, chapter 90 (USDA Forest Service 2016), new allotment management plans would be developed for each allotment and would be incorporated into the term grazing permits. The allotment management plans would specify the goals and objectives of management, management strategies, range improvements, and monitoring requirements and would incorporate an adaptive management strategy.

Feeding of hay or other feed would be limited to feeding livestock temporarily confined to corrals and holding facilities or in emergency situations as approved by the line officer. Forage certified to be weed free or commercially processed should be used.

Salt or supplement should be placed at least ¼ mile from all water sources and riparian areas, away from roads, high-use recreation areas, or other known livestock concentration areas except for land and resource treatment purposes. Salt or supplement should be placed and moved to less utilized areas. No salting would occur within or adjacent to identified heritage resources.

Annual Operating Instructions

On an annual basis, the Forest Service personnel and permittees would jointly prepare annual operating instructions prior to each grazing year. Annual operating instructions authorize the actual season of use and number of livestock that would use the allotment for that given year, up to the permitted numbers. Actual use may vary each year depending on monitoring, past use, resource conditions, and management objectives. Since livestock numbers are anticipated to fluctuate on a year-to-year basis from an adaptive management perspective a reduced level of grazing for resource protection would be within permitted numbers and non-use agreements would not be necessary (Forest Service Handbook 2209.13_10).

Annual operating instructions typically include such things as:

- the authorized use on the allotment for the current grazing season and the numbers, class, type of livestock, and timing and duration of use;
- the planned sequence of grazing in pastures on the allotment and the management prescriptions and monitoring that would be used to make changes;
- improvements to be constructed, reconstructed, or maintained and who is responsible for these activities; and
- utilization levels or other guidelines to be applied and followed by the permittee to properly manage livestock.

Proposed Authorizations and Improvements

Term grazing permits would be issued for each allotment for the numbers and terms described below. Permits identify the number, kind, and class of livestock; maximum animal unit months; and the season of use permitted on the allotment. The kind of livestock permitted would be cattle and horses, up to an animal unit month level. However, classes of animals such as cow/calf pairs, yearlings, or bulls, or some combination thereof, may be authorized annually up to the animal unit month level. Term grazing permits also include terms and conditions for maintenance responsibilities of range improvements.

Table 3. Existing term grazing permits with the proposed permitted numbers and season of use that would be included in the new term grazing permits

Allotment	Existing Term Grazing Permit	Proposed permitted numbers and season of use
Alma Mesa	682 cow/calf pairs and 18 horses, yearlong (8,443 AUMs)	682 cattle and 18 horses, yearlong, up to 8,443 AUMs
Blackjack	325 cow/calf pairs and 15 horses, yearlong (4,116 AUMs)	400 cattle and 15 horses, yearlong, up to 5,016 AUMs
Copperas	135 cow/calf pairs, yearlong, 40 yearlings January through October, 46 yearlings January through May and 4 horses, yearlong, (2,117 AUMs)	171 cattle and 4 horses, yearlong, up to 2,117 AUMs
Hickey	405 cow/calf pairs and 8 horses, yearlong (4,975 animal unit months)	405 cattle and 8 horses, yearlong, up to 4,975 AUMs
Keller Canyon	70 cow/calf pairs, September 1 - March 1. (599 AUMs). 419 AUMs or 70% for the National Forest System portion and 180 AUMs or 30% for the waived private lands portion	70 cattle, yearlong. (600 animal unit months). 420 AUMs or 70% for the National Forest System portion and 180 AUMs or 30% for the waived private lands portion
Lop Ear	60 cow/calf pairs from November 1 through April 30, and 30 cow/calf pairs from May 1 through October 31, (539 AUMs)	60 cattle from November 1 through April 30, and 30 cattle from May 1 through October 31, up to 539 AUMs
Pleasant Valley	Vacant. The permit for 2,177 AUMs was cancelled in 2004	900 animal unit months assigned to the Blackjack allotment and 1,277 AUMs cancelled
Alma	300 cattle yearlong, (3,600 AUMs)	300 cattle, yearlong, up to 3,600 AUMs
Citizen	424 cattle, and 10 horses yearlong (5,232 AUMs)	424 cattle, and 10 horses yearlong, up to 5,232 AUMs
Dry Creek	275 cattle, 5 horses, yearlong (3,372 AUMs)	275 cattle and 5 horses, yearlong, up to 3,372 AUMs
Holt Gulch	150 cattle, yearlong; 3 horses, March 1 to October 31 (1,843 AUMs)	150 cattle and 3 horses, yearlong, up to 1,843 AUMs
Pleasanton	499 cattle, 13 horses, yearlong (6,173 AUMs	500 cattle and 12 horses, yearlong, up to 6,173 AUMs
Potholes	195 cow/calf pairs November 16 to April 15 and 80 cow/calf pairs June 16 to November 15 (1,370 AUMs)	114 cattle, yearlong, up to 1,370 AUMs
Sacaton	FS permit - 120 cow/calf pairs, December 1 - June 30 (836 animal unit months) Private land permit - 10 cattle, December 1 - June 30 (70 AUMs). Total 906 AUMS	FS permit - 120 cattle, December 1 - June 30 (836 AUMs) Private land permit - 10 cattle, December 1 - June 30 (70 AUMs). Total 906 AUMS

AUMs = animal unit months

Several new structural improvements are proposed. Management of the allotments is not dependent upon the proposed range improvements except for the areas specified below. The proposed improvements are not for increasing numbers of permitted livestock but could assist with more effective management of the resource (distribution, pasture rotation, etc.).

In the description of actions by allotment, the proposed improvements are listed in priority order. Maps of proposed improvements may be found in appendices A through N on the project webpage at https://www.fs.usda.gov/project/?project=22466.

Specific locations have been identified where improvements are needed to address specific resource or management issues explained in more detail below for each allotment, along with mitigation measures or design features to address them. Until the associated improvements are implemented, livestock use in the following areas would be limited or excluded:

1. A portion of the Pleasant Valley allotment is proposed to be closed to livestock grazing with the remainder divided between the Blackjack and Hickey allotments. Improvements would need to be installed to facilitate this.
    a. Blackjack allotment: Prior to using the Lightning Mesa and Mesquite Flat pastures, fencing is needed to exclude livestock use from Dix Creek, the lower half-mile section of Right Prong Dix Creek, a 4-mile portion of Left Prong Dix Creek, and assist with excluding livestock from the San Francisco River (map 3.2, appendix C).
    b. Both Hickey and Blackjack allotments: Prior to using the Hamilton Mesa pasture, the Lightning Mesa pasture, or both, a fence is needed to control livestock distribution (map 3.2, appendix C). The fence would be approximately 0.8 miles long and would run along Red Tank Canyon between the Hamilton Mesa and Lightning Mesa pastures of the current Pleasant Valley allotment.
2. Two exclusionary fences to avoid potential trampling of cultural resources: one on the Lop Ear allotment and the other on the Sacaton allotment.
3. Webster Spring: Additional water location and possible fencing as described under the Citizen allotment (map 9.1, appendix I).

Table 4 and table 5 summarize the number of proposed improvements by allotment. No improvements are proposed for the Holt Gulch or Potholes allotments. Total new improvements for allotments on both national forests are approximately 16.7 miles of fence, 27 storage tanks, 51 troughs, 46.5 miles of pipeline, 5 wells, 3 cattleguards, 3 solar panels, 1 trick tank, and 4 corrals.

Table 4. Summary of proposed new improvements on the Apache-Sitgreaves allotments

Allotment	Miles of Fence	Storage Tanks	Troughs	Miles of Pipeline	Wells	Cattleguards	Solar Panels	Trick Tank	Corrals
Alma Mesa	5	5	6	5.5	0	0	1	0	1
Blackjack	3.3	6	14	13.7	3	3	0	0	3
Copperas	2.5	2	5	0.8	0	0	1	0	0
Hickey	1.4	2	8	6.5	0	0	1	0	0
Keller Canyon	0	1	1	0.7	0	0	0	0	0
Lop Ear	0.1	2	2	1.4	0	0	0	1	0

Table 5. Summary of proposed new improvements on the Gila allotments

Allotment	Miles of Fence	Storage Tanks	Troughs	Miles of Pipeline	Wells	Cattleguards	Solar Panels	Trick Tank	Corrals
Alma	4.2	0	0	1.6	0	0	0	0	0
Citizen	0.1	3	7	7.6	0	0	0	0	0
Dry Creek	0	2	2	0.5	1	0	0	0	0
Pleasanton	0	2	6	8.2	1	0	0	0	0
Sacaton	0.1	0	0	0	0	0	0	0	0

Per forest plan direction, constructed features (improvements) should be maintained to support the purpose(s) for which they were built. Existing improvements would continue to be assigned an improvement number with maintenance responsibilities assigned to the permittee with reconstruction occurring as needed.

When improvements are no longer needed for the purpose(s) for which they were built, they should be removed. On the Blackjack and Pleasant Valley allotments, approximately 8 miles of fence, 2 dirt stock tanks, and 2 corrals are no longer needed. The 2 dirt stock tanks are silted in and would left as is. One corral would be left on site while the other corral and 8 miles of fence would be removed as time and funding permits.

Proposed improvements that result in ground disturbance require heritage surveys and consultation with the respective State Historical Preservation Office and tribes prior to construction. Improvements would be located to avoid impacts to heritage resources. If unrecorded sites are discovered during the course of project implementation, activities would cease and the forest archeologist would be notified.

Reliable water is often the limiting factor in properly utilizing and managing grazing allotments. This fact is evident in the number of proposed water improvements. Conversely, this may cause higher grazing intensities and a downward trend in resource conditions in localized areas adjacent to the new watering points. Prior to installing water improvements, necessary applications or permits and approvals would be processed with the appropriate State agency, such as the Arizona Department of Water Resources or the New Mexico Office of the State Engineer.

Water troughs and open storage tanks would include effective wildlife escape ramps such as those designed by Bat Conservation International which extend into the water and all the way to the edge of the trough.

Fences, including those for water lots, would typically consist of a 4-strand barbed wire fence using 12-gauge barbed wire. Only the top 3 wires would be barbed wire. To facilitate wildlife passage, the top wire would not exceed 42 inches above ground and the bottom wire would be smooth barbless wire 18 inches above ground. As needed other types of fencing, such as, but not limited to, pole or rail fencing may be used.

Except for a proposed single water point on the Alma allotment, the San Francisco River is excluded from grazing. Upper Sacaton Creek and the lower sections of Big Dry and Little Dry Creeks as well as the spring source at Webster Spring are excluded from livestock grazing. It is proposed to also exclude Dix Creek and the lower portions of Right Prong Dix Creek and Left Prong Dix Creek from grazing.

Although these areas would be excluded from grazing, no exclosure or fence is 100 percent effective. Therefore, they will be monitored as needed for the presence of livestock. If livestock are observed in these areas, Forest Service personnel will take action to address excess use (if the owner of the livestock is a national forest permit holder) or unauthorized use (if the owner of the livestock in not a national forest permit holder) in accordance with Code of Federal Regulations (CFR), Forest Service handbook direction, or both.

On both national forests, additional fencing of these areas may be added in the future as necessary to continue excluding livestock use. Should additional fencing be needed, both biological and cultural clearances would be completed prior to implementation.

Fences are be kept in good condition to control livestock distribution. If livestock are observed in unauthorized areas, action would be taken to remove the livestock following Forest Service procedures and fences would be repaired or extended as needed.

Most of the allotments contain small pastures that would be used at various times during the year as holding pastures to aid in livestock management.

Specific proposed authorizations for allotments on the Apache-Sitgreaves National Forests are described below.

Alma Mesa Allotment (46,216 acres) (Map 1, Appendix A)

Permitted use would remain at 682 cattle and 18 horses or equivalent, up to 8,443 animal unit months. Use on the Alma Mesa allotment would continue to be permitted for yearlong grazing using rotational grazing systems.

The 2017 proper functioning condition surveys indicate Dutch Blue Creek is functioning at risk due to limited recruitment of seedlings and saplings, with no apparent trend. Dutch Blue Creek occurs within the Bear Valley pasture of the Alma Mesa allotment and is identified as potential suitable habitat for the southwestern willow flycatcher and yellow-billed cuckoo. Since this creek is functioning at risk grazing intensity levels would be limited to light to non-use (0 to 30 percent) until it is again functioning properly. At that time the grazing intensity would be up to 35 percent per general guidelines in appendix G of the southwestern willow flycatcher recovery plan. Utilization levels for the rest of the allotment would be managed at levels described above in the "Intensity of Grazing" section.

Livestock grazing in the Bear Valley pasture would occur primarily during the dormant season between October 1 and April 30, allowing for summer growing season rest each year. The remaining pastures and traps would be managed under a deferred-rotation schedule to provide periodic growing season rest or deferment for plant recovery

Special Authorizations: As approved by the Associate Chief of the Forest Service (May 19, 1975), the permittee would be authorized, within the Blue Range Primitive Area, to continue operating motor-driven pumps for the Stateline Cabin well (improvement #3723), to use motorized vehicles to service the well, and to use mechanical equipment to use and maintain the service road (National Forest System Road 711) with proper erosion control features. This authorization would be included in the term grazing permit.

Proposed improvements are listed in priority order. The proposed improvements are to help with the more effective management of the resource with no proposed increase in permitted livestock numbers. Stateline Camp, Alma Mesa pasture, and West Trap are located within the Blue Range Primitive Area. Transporting materials for proposed improvements may include pack animals, motorized vehicles, or helicopters (Congressional Guidelines 1990). Potential effects to the Blue Range Primitive Area are addressed in the "Special Management Areas Environmental Consequences" section below, in the "Recreation and Special Management Areas" report and the January 28, 2019 minimum requirements analysis in the project record.

Alma Mesa Pasture (within the Blue Range Primitive Area)

- For better livestock distribution resulting in the more effective management of the resource, install approximately 2.1 miles of pipeline to 2 storage tanks and 2 troughs. One storage tank would be located in Township 1 North, Range 32 East, Section 6 Northeast (T1N, R32E, Section 6 NE) and the other in T1N, R32E, Section 8 NW, splitting the fence with the North Stateline pasture.[6] Water would be supplied from the Stateline Cabin well (map 1.1, appendix A).
- The area near the confluence of Little Blue Creek and Yam Canyon includes Mexican spotted owl habitat and an occupied Protected Activity Center. Recent surveys indicate these two streams are in proper functioning condition. To help maintain satisfactory conditions, it is proposed to install a fence approximately 0.8 miles in length in the northwest corner of the Alma Mesa pasture in T2N, R32E, Section 30 SW and Section 31 NW to restrict livestock access to these streams when the Alma Mesa pasture is used. This new fence would also allow the removal of approximately 1.3 miles of existing fence. Livestock access and use at the confluence of these streams would occur when livestock trail between the Alma Mesa and Bear Valley pastures. This would shorten the season of use to (October 1 to April 30) and extend the rest period in this area (map 1.2, appendix A).
- Construct approximately 0.75 miles of fence on the south end of the pasture from West Trap fence to the edge of the Little Blue Creek drainage in T1N, R32E, Section 7 SW to create a small trap pasture to aid in working and moving cattle through the allotment (map 1.1, appendix A).

Maple/Charlie Moore Pasture 12,543 acres (7,262 acres in Primitive Area) (Map 1.3, Appendix A)

- Construct or reconstruct a pasture division fence approximately 3 miles long on the ridgeline outside of, but adjacent to, the Blue Range Primitive Area boundary in T1N, R31E, Section 36 and T1N, R32E, Sections 29, 30, and 31 to separate the southern portion of the Maple/Charlie Moore pasture from the Six Shooter area.
- Outside the primitive area, extend a pipeline approximately 1 mile from Charlie Moore Spring, west to a storage tank and trough in T1N, R32E, on the section line of Sections 31 and 32 to improve water availability and distribution in Maple pasture. This would improve the adaptive management capabilities of the pasture and better ensure it could be utilized when needed in the rotation schedule followed by appropriate rest.

[6] This need for additional water in the Alma Mesa pasture was also recognized in 1981. To improve livestock distribution, the 1981 allotment management plan approved similar improvements.

West Trap (within the Blue Range Primitive Area)

- Extend a pipeline approximately 0.8 miles from Stateline Cabin to the west side of West Trap and install a storage tank and trough with a water lot fence around the trough in T1N, R32E, Section 18 N1/2. This water would be accessible from three pastures, improving distribution and reducing the livestock impacts to the Stateline Cabin area (map 1.1, appendix A).

NM South and Beaver Trap

- Extend the waterline approximately 0.8 miles from the Charlie Moore storage tank in T10S, R21W, S31, along County Road C034, to the pasture division fence between NM South and Beaver Trap pastures in T10S, R21W, Section 33 SE and install a new storage tank and a trough(s) that would supply water to both pastures. This would improve the management in both pastures and better ensure use could occur with the rotation schedule followed by appropriate rest (map 1.4, appendix A).
- Construct a water lot fence around the storage tank and trough next to the state line fence in T10S, R21W, Section 31 SW. The storage tank and trough are approximately 60 feet east of the fence line. A water lot would make the water accessible from three pastures (proposed new Six Shooter, Maple/Charlie Moore, and New Mexico South) and improve distribution (map 1.5, appendix A).
- Extend the Charlie Moore corrals on the New Mexico side of the fence to include a pen and loading shoot directly east of Charlie Moore Cabin at T10S, R21W, Section 31 (map 1.5, appendix A).

NM North/NM South Pastures

- Extend an existing pipeline in T10S, R21W, Section 19, approximately 0.8 miles east to a trough(s) that would supply water to both pastures in T10S, R21W, Section 20 SW to improve distribution in both of these pastures (map 1.6, appendix A).

Stateline Camp in T1N, R32E, Section 17, NW (within the Blue Range Primitive Area)

- Add solar panels to the Stateline Cabin well and storage tank pump. The existing motorized diesel generator may remain on site for a backup as needed (map 1.7, appendix A).

Pleasant Valley Allotment (13,171 Acres) (Map 2, Appendix B)

The December, 2001 Pleasant Valley allotment decision notice reduced the permitted numbers on the Pleasant Valley allotment 32 percent from 3,202 animal unit months to 2,177 animal unit months and excluded livestock grazing from the San Francisco River corridor.

The Pleasant Valley allotment was vacant from 2006 through 2015. From 2016 to present, livestock grazing has been authorized in conjunction with the Blackjack and Hickey allotments, on a trial basis, in keeping with Forest Service policy.

The Pleasant Valley allotment is proposed to be divided with approximately 43 percent of the area incorporated in the Blackjack allotment and 38 percent in the Hickey allotment as described below. The remaining 19 percent along the San Francisco River, Dix Creek, a 4-mile portion of Left Prong Dix Creek, and the lower half-mile reach of Right Prong Dix Creek would remain with the Pleasant Valley Allotment. No term grazing permit would be issued for the Pleasant Valley allotment and it would be closed to livestock grazing. The permittee would not have maintenance responsibility of the corral or Split Ridge Tank in the excluded area (map 2.1, appendix B).

As described above in the "Intensity of Grazing" section, forage utilization levels would be 31 to 40 percent. For riparian reaches not functioning properly, utilization would be limited to a light use level of 0 to 30 percent until proper functioning condition is obtained. The current utilization standard for the Pleasant Valley allotment is 35 to 40 percent during the growing season and 40 to 45 percent during the dormant season.

Of the 2,177 animal unit months currently associated with the Pleasant Valley allotment, 900 would be assigned to the Blackjack allotment and the remaining 1,277 would be retired.

No new term grazing permit would be issued for the Pleasant Valley allotment and the allotment would be removed from the Forest Service database of record.

Proposed improvements for those pastures currently on the Pleasant Valley allotment are described below under the Blackjack and Hickey allotments according to the pastures that are proposed to be added to those allotments.

Blackjack Allotment (31,833 acres) (Map 3, Appendix C)

The allotment boundary would be modified to incorporate the Dix Mesa, Dix Saddle, Lightning Mesa, most of the Mesquite Flat pasture, and a portion of the Left Prong pasture from the Pleasant Valley allotment into the Blackjack allotment. The 60-acre Red Tank Trap would be shared between the Blackjack and Hickey allotments.

These pastures cover approximately 5,630 acres or 43 percent of the Pleasant Valley allotment and would increase the size of the Blackjack allotment to 37,463 acres. The permit would change from 325 cow-calf pairs and 15 horses for 4,116 animal unit months to 400 cattle and 15 horses for up to 5,016 animal unit months. However, authorized use would not exceed the current permitted use of 4,116 animal unit months until such time as the proposed Maverick tank and Brushy Canyon water developments and the Dix Creek fence are installed and based upon monitoring results.

Some of the design features from the Pleasant Valley allotment 2001 environmental assessment and decision notice (USDA Forest Service 2001) are incorporated into this alternative for the Pleasant Valley pastures that would be managed as part of the Blackjack allotment:

- Livestock grazing would continue to be excluded from the San Francisco River
- Although Dix Mesa may be used during any month, it is expected it would be used primarily in conjunction with spring or fall shipping periods
- The pastures would be managed under a rotation schedule with more months of rest than months of use

Season of use would continue to be yearlong, using a deferred-rest-rotation schedule with the following exceptions:

- The two Coal Creek pastures would be permitted for winter dormant season use sometime between November 1 and March 1. Mesquite Flat pasture would typically be used in the fall.
- Livestock grazing would continue to be excluded from the San Francisco River and the allotment boundary would be modified to show the San Francisco pasture, Dix Creek, the lower half-mile section of Right Prong Dix Creek, and the lower 4-mile portion of Left Prong Dix Creek being outside of the allotment and closed to grazing.

Motorized Access: It is proposed to add the following existing routes as newly constructed maintenance level 2 National Forest System roads, open to the public and to be included on the motor vehicle use map. These roads are not being analyzed in the current travel management assessment and are therefore considered a connected action. The roads exist in a "General Forest Management Area" described in the Apache-Sitgreaves forest plan and have existed for a number of years (map 3.1, appendix C). The roads would be added in the Coal Creek 6th-level watershed. The road density for the Coal Creek 6th-level watershed would increase from a ratio of 0.8 to 1.0 miles of road per square mile of land.

- The existing two-track road along Coal Creek, north of Highway 78, in T4S, R32E, Sections 5, 8, and 9 and the connecting two-track road approximately 0.8 miles in length to Line Tank #7035 in T4S, R32E, Section 4.
- The two-track road to The Junipers Mesa, which is approximately 3.4 miles in length, starts at the junction of Martinez Ranch Road 212 and Highway 78 in T4S, R32E, Section 17 NW and continues north to The Junipers Mesa in T3S, R32E, Section 31. This road goes to Juniper Corral which was once a Forest Service administrative site.

Proposed improvements at Brushy and Rattlesnake Canyons are to provide reliable water and better distribution in the Rattlesnake pasture. The intent is to lessen the pressure and dependence of water in Rattlesnake Canyon where the soils were reported to be in static trend and the riparian was rated as functioning at risk with a recommendation to better disburse cattle in the uplands. The proposed improvements in the Rattlesnake pasture would also assist with an improved rotation system and better ensure adequate rest periods in other areas of the allotment.

The Beefeater pasture is a large 9,966-acre pasture and central to the management of the allotment. The proposed water improvements at Maverick Tank/Big Lue would aid in livestock distribution and provide for greater control of the timing, intensity, and duration of use.

Dix Creek (Pleasant Valley Allotment) (Map 3.2, Appendix C)

- Dix Creek is an important riparian area and wildlife corridor with habitat for threatened and endangered species. It is proposed to install a fence and cattleguard on the south side of Left Prong Dix Creek in T3S, R31E, Sections 9 and 10 to change the allotment boundary and exclude livestock use from Dix Creek, the lower half-mile perennial portion of Right Prong Dix Creek, approximately 4 miles of lower Left Prong Dix Creek, and the San Francisco River.
- Install a ¼ mile fence in Left Prong Dix Creek in T3S, R31E, Section 23 to exclude livestock grazing from the lower section of Left Prong Dix Creek

Rattlesnake Canyon (Map 3.3, Appendix C)

- Install a well near Rattlesnake Spring and National Forest System Road 215 in T4S, R31E, Section 20 NE and extend a pipeline approximately 0.5 miles northwest to a storage tank and trough on the fence line in Section 17 SW, then continue west approximately 0.5 miles to a trough in Section 18 SE. Extend a second line approximately 1.2 miles east along a fence line to a trough in Section 21 NE.

Brushy Canyon (Map 3.3, Appendix C)

- Install a well and corral east of Chalk Peak where National Forest System Road 8365 crosses the canyon in T4S, R31E, Section 19 NW, and extend a pipeline southwest approximately 0.5 miles to a storage tank and trough in T4S, R30E, Section 24 SW.

Maverick Tank/Big Lue (Map 3.1, Appendix C)

- Install a well near Maverick Tank in T4S, R32E, Section 7 to supply water to two pipelines:
    - One pipeline would extend northwest approximately 3.1 miles, predominately following a four-wheel-drive, two-track road between Six Shooter and Beef Eater Canyons ending at the existing Middle Tank in T3S, R31E, Section 35 NW. This pipeline would include a storage tank and approximately three troughs. A portion of Middle Tank may be fenced to provide water and habitat for frogs and other wildlife. Also, two lateral lines would extend to existing wildlife guzzlers in T4S, R31E, Section 1 and T3, R31E, Section 35. Maintenance would be the responsibility of the permittee. Livestock use would be seasonal while wildlife would continue to have year-round access.
    - The second pipeline would extend southeast crossing Big Lue Canyon and continue north across The Junipers Mesa to two storage tanks and approximately three troughs in T4S, R32E, Sections 5 and 8, and T3S, R32E, Section 31.

Rattlesnake West (Map 3.4, Appendix C)

- East of Mulligan Peak is an existing trick tank in T4S, R30E, Section 21 SE and an existing wildlife guzzler in T4S, R30E, Section 23 which would be repaired and modified to create wildlife troughs and separate livestock troughs instead of installing a new well east of Mulligan Peak. Livestock use would be seasonal while wildlife would continue to have year-round access.
- Install a small corral in T4S, R30E, Section 22 SW to facilitate handling livestock in the southwest portion of the allotment.

Maggett Spring (Map 3.3, Appendix C)

- Extend a pipeline east approximately 0.4 miles from a well on the permittee's private land in T4S, R31E, Section 26 NE to a storage tank and trough on National Forest System lands in T4S, R31E, Section 25 NW.

Mesquite Pasture (Pleasant Valley Allotment) (Map 3.2, Appendix C)

- From the existing Red Tank Well, extend a pipeline to the north ¼ mile and add a storage tank and trough in T3S, R31E, Section 20 and continue north approximately 1 mile to a second trough with a lateral line extending to Mesquite Flat Tank in T3S, R31E, Section 16.
- Construct a water lot fence around Mesquite Tank to control access to water and control timing and duration of use in this pasture.

Dix Mesa (Pleasant Valley Allotment) (Map 3.2, Appendix C)

- The two gates on either end of Dix Mesa along Martinez Ranch Road #212 are often left open. It is proposed to install two cattleguards in T3S, R31E, Section10 SE, Section 23 N 1/2.
- Install a water lot fence around Dix Mesa Tank in T3S, R31E, Section 10 SE and move the pasture boundary fence approximately ¼ mile to the west end of the mesa.

The Junipers (Map 3.1, Appendix C)

- Install a corral and wing fences on The Junipers Mesa in T4S, R32E, Section 8 NW to work and ship livestock and aid with the pasture rotations.

White Peaks (Map 3.3, Appendix C)

- Install a 0.75-mile fence in T4S, R31E, Section 22 E 1/2 from White Peaks northeast to the existing pasture division fence. The existing fence location tends to confine or trap livestock in the Rustler Canyon area and contributes to Rustler Canyon being functioning at risk with no apparent trend.

Improvements to Remove

In response to the scoping notice and in keeping with forest plan direction, the following improvements of approximately 8 miles of fence, 1 corral, and 1 stock tank are no longer needed and would be removed unless otherwise noted.

- A portion of the 1.5-mile Coal Creek/Beefeater Fence #3076, starting at Big Lue Ranch in T4S, R32E, Section 18 and continuing northeast to Section 8 NW (map 3.1, appendix C).
- A portion of the 3.5-mile Coal Creek/Maverick Fence #3077 starting at T4S, R32E, Section 20 NW by Old Collett Tank and continuing north to Section 8 SE. The steep natural terrain creates a sufficient holding feature for this pasture (map 3.1, appendix C).
- The 2.6-mile interior boundary fence #3082 on the west side of The Junipers Mesa along Big Lue Canyon from T4S, R32E, Section 5 SW and continuing northwest to T3S, R32E, Section 30 SW.
- Juniper Corrals #3088 in T4S, R32E, Section 5 SW would be removed from the term grazing permit. The permittee would no longer be responsible to maintain it, but it would not be physically removed (map 3.1, appendix C).
- White Peaks pasture fence #3081 located in T4S, R31E, Sections 21 and 22. Fence #3083 from White Peaks south to the Forest boundary would be removed. This would turn White Peaks 1 and White Peaks 2 pastures into one pasture (map 3.3, appendix C).
- Blackjack Tank in T4S, R32E, Section 32 SE, NW would be removed from the term grazing permit. The permittee would no longer be responsible to maintain it. It has filled in with sediment and would be allowed to remain without being cleaned out (map 3.5, appendix C).

Hickey Allotment (24,172 acres) (Map 4, Appendix D)

The allotment boundary would be changed to add the Hamilton Mesa, Pleasant Valley, and Johnnie pastures from the Pleasant Valley allotment to the Hickey allotment. The 60-acre Red Tank Trap would be shared between the Blackjack and Hickey allotments. These pastures cover approximately 5,023 acres, or 38 percent, of the Pleasant Valley allotment.

Livestock grazing has been excluded from the San Francisco pasture and Bird Trap due to riparian concerns. The allotment boundary would be changed to remove these two pastures from the Hickey allotment, decreasing the allotment by 2,740 acres.

There would be a 9 percent (2,283 acres) net increase in the size of the allotment for a total of 26,455 acres. The permitted numbers would remain the same at 405 cattle and 8 horses for up to 4,975 animal unit months. Permitted season of use would continue to be yearlong utilizing a deferred-rest-rotation system among the various pastures and traps.

Motorized Access: It is proposed to add the following existing route, in a General Forest Management Area, as a newly constructed maintenance level 2 National Forest System road, open to the public, and to be included on the motor vehicle use map as a connected action similar to that described above for the Blackjack allotment. This would occur in the Dix Creek 6th-level watershed. The road density for the 6th-level watershed would not change (currently 0.9 miles of road per square mile of National Forest System land).

- The existing two-track road from National Forest System Road 215 near Red Tank Well in T3S, R31E, Section 20 SW and continuing southwest approximately 0.7 miles to Johnnie Tank[7] (map 3.2, appendix C).

Proposed Improvements: The primary focus is to improve water availability and control when water is available for livestock use.

Sunset Pasture Water Lots - (Map 4.1, Appendix D)

- In the Sunset pasture, construct a water lot fence around Cave Spring (#3246) in T4S, R 30 E., Section 11 NE, between the Sunset and Silver Basin pastures and another around Silver Basin Tank (#3241) in T4S, R 30 E., Section 12 SE to better control livestock use and distribution. Controlling livestock access to these two waters would help improve upland conditions near monitoring site C4 which currently shows a slight downward trend.

New Allotment Boundary Fence (Pleasant Valley Allotment) (Map 3.2, Appendix C)

- Construct a fence approximately 0.8 miles in length along Red Tank Canyon between the Hamilton Mesa and Lightning Mesa pastures of the current Pleasant Valley allotment that would be an allotment boundary fence between the Blackjack and Hickey allotments in T3N, R31E, Sections 21 and 28.

[7] The preliminary environmental assessment proposed extending this road another 0.6 miles to Curly Tank in T3S, R31E, Section 20 NW. However, a short section would extend into the Sunset Inventoried Roadless Area so it is now proposed to end at Johnnie Tank.

Red Tank Well Pipeline Extensions (Pleasant Valley Allotment) (Map 3.2, Appendix C)

- An existing pipeline extends from Red Tank Well (#3457) in T3S, R31E, Section 20, south following a two-track road to Hamilton corrals (#3453). The proposal is to add a trough at the corrals and extend the pipeline 0.25 miles to Hamilton Tank (#3438) in Section 28 SW and continue south approximately 1.25 miles and add a storage tank and trough at the pasture division fence in T3S, R31 East, Section 32 SE.
- Extend a pipeline west approximately 2 miles, following the two-track road to Johnnie Tank (#3456) and Curly Tank (#3440) and continuing to the ridge top in T3S, R31E., Section 19 NE with solar panels, and pumps as needed to accommodate the elevation change. From Section 19, extend two lateral lines: one to the northwest approximately 0.75 miles to a trough at Snake Ridge Tank and corrals in the adjacent Section 18 and one north approximately 1.7 miles to a trough at Piñon Tank #1 and corrals in Section 8 SE. There would be an estimated 2 storage tanks and 5 troughs on this system.
- Extend a pipeline from the existing storage tank along National Forest System Road 215 in T3S, R31E, Section 29 NW, approximately 1.2 miles southwest to an open ridge in Section 30 SW to a storage tank and trough in the Pleasant Valley pasture.

Hickey Allotment Water Lots

- Install 3 more water lot fences to improve livestock use and distribution: (appendix D)
  - Limestone Gulch Spring (#3103) in the southwest corner of the allotment in T4S, R30E, Section 16 SW (map 4.1, appendix D).
  - Sunset Spring (#3713) in the Sunset pasture in T3S, R30E, Section 35. This fence may cross Trail #311 (map 4.2, appendix D).
  - Hickey Spring (#3245) in T3S, R30E, Section 26 NW, between Sunset and Little Hickey pastures and Hickey Trap. This fence may cross Trail #311 (map 4.2, appendix D).
  - A portion of Rattlesnake Tank #1 (#3254) may be partially fenced or otherwise modified , including, but not limited to, completely fencing it and installing a stand pipe and pipeline to a nearby trough to provide water and habitat for frogs and other wildlife

Copperas Allotment (9,201 Acres) (Map 5, Appendix E)

The current permit is for 135 cattle and 4 horses yearlong and 86 yearlings seasonally for 2,117 animal unit months. The permit would remain at 2,117 animal unit months but the number and kind of livestock would be 171 cattle[8] and 4 horses yearlong to provide greater flexibility in adjusting numbers annually to respond to changing needs.

Proposed Improvements: As with each allotment, resource conditions are satisfactory overall, but a change in some management practices with the aid of additional improvements could improve management of the allotment and improve conditions in some areas.

[8] Corrected from 163 cow-calf pairs in the scoping notice.

Coalson Canyon (Map 5.1, Appendix E)

- Coalson Canyon near Coalson Ranch has seasonal water similar to Bullard Canyon, although the 2013 flood was not as impactful. In 2006, surveys reported the reach above the cabin to be nonfunctional and the reach below the cabin to be functioning at risk. In 2018, surveys reported some improvement with the reach above the cabin as functioning at risk and below the cabin as functioning at risk with an upward trend. To assist with and expedite improving conditions in Coalson Canyon it is proposed to do the following:
  - Use the existing spring development just south of Coalson Cabin (#3769) in T2S, R32E, Section 8, SW, to supply water with a pipeline to approximately 5 troughs; 1 near the spring, 1 at the corrals, 1 in the low saddle directly east of Coalson Cabin to service Copperas Trap and Breeding Pasture, and 2 troughs on the west side of Coalson Canyon to service Coalson Pasture.
  - Install a short fence adjacent to Coalson Cabin (#3769) to create a small water gap in Coalson Canyon for Coalson Pasture.

    These would greatly reduce the need for livestock to access the drainage bottom for water. With the water improvements above, Copperas Trap would be used intermittently as a trap with longer rest periods between times of use to facilitate continued improvement of the lower reach. Also, livestock access in the small traps near the line shack would be limited most of the time, providing extended periods of rest.
  - Relocate the outhouse near the drainage bottom to an upland site east of the stone cabin.
  - If needed, based on riparian monitoring, fence the upper Coalson Canyon reach to be used intermittently with longer periods of rest than is occurring currently.

Bullard Canyon (Map 9.1, Appendix I)

- Bullard Canyon, in the northern portion of the allotment, has a dry canyon bottom with short sections where water trickles seasonally or where potholes remain with water part of the year. Surveys in 2006 and 2018 report the upper reach near Stacey Spring to be in proper functioning condition, but the lower section in Bullard Trap is reported to be functioning at risk in T1S, R32E, Section 32. A major flood in 2013 transported enough rock and debris to debark the trees, killing the majority of the trees in the lower section. The surviving trees are debarked from 2 to 5 feet up on the upstream side of the trees. This created much large woody debris in the channel but also caused a need for recruitment of seedlings and saplings which can be a limiting factor for proper functioning condition and may be affected by grazing. To address this, the following are proposed:
  - In Bullard Trap, the lower fence (#3125) would be moved approximately 200 feet upstream to create a narrow water lane outside of the trap.
  - Only use Bullard Trap (#3125) for short durations when needing to hold and sort cattle and predominately during the dormant season to provide for extended growing season rest.
  - Based on monitoring, a fence may be installed to create a lane in the uplands on the east side of Bullard Trap (#3125) to allow livestock to access to the upper portion of Bullard Canyon without having to trail through the trap along the drainage bottom.

Water Lots (Map 5.1, Appendix E)

- To assist with livestock distribution and control of timing, intensity, and duration of use, it is proposed to install water lot fences around Coalson Tank (#3129) in T2S, R32E, Section 18 and around Sluefoot Blue Tank (#3132) in Section 17. A few respondents to the scoping notice commented about relying more on herding than fencing or minimizing fencing. Controlling access to these dirt tanks with the proposed water lots in lieu of longer interior pasture fencing should be effective for proper distribution while minimizing fencing.
- Based on monitoring, a 1.25-mile fence may be installed to divide Breeding pasture. It would start in T2N, R32E, Section 17 and proceed northeast to the allotment boundary in Bullard Canyon in Section 9.

Keller Canyon Allotment (1,533 Acres) (Map 6, Appendix F)

Currently, the allotment is a seasonal allotment from September 1 to March 1. The season of use would change to year-round to provide more flexibility of times to graze. A term grazing permit with on-and-off provisions would be issued for 70 cattle, yearlong for up to 420 animal unit months for the National Forest System portion (70 percent) of the allotment, plus 180 animal unit months for the private lands portion (30 percent) of the allotment, for a total of up to 600 animal unit months.

Grazing could occur any time during the year. However, if the allotment were fully stocked with 70 cow-calf pairs, the upper limit of 600 animal unit months would be reached in just over 8 months and the livestock would be removed from the allotment for the remainder of the year.

The Keller Canyon allotment is currently managed by the Clifton Ranger District, Apache-Sitgreaves National Forests. Due to its location, the allotment would be administered by the Glenwood Ranger District, Gila National Forest in the future.

Proposed Improvements (Map 6.1, Appendix F)

- Hollimon Pasture: A pipeline from the existing Hollimon Well in T10S, R20W. Section 32 SE would extend west along National Forest System Road 4054U approximately 0.3 miles, then north along National Forest System Road 4054T approximately 0.4 miles to a storage tank and trough near the existing Hollimon stock tank in T10S, R20W. Section 32 NW.

Lop Ear Allotment (3,268 Acres) (Map 7, Appendix G).

Permitted numbers would remain at 60 cattle during the winter dormant season from November 1 through April 30 and 30 cattle through the growing season from May 1 through October 31 for up to 539 animal unit months. Livestock grazing would be managed using an adaptive management strategy that is sustainable or regenerative in concept and would provide flexibility to adapt management to changing circumstances

Proposed Improvements

- Install a short exclusionary fence to protect a cultural resource site.
- Proposed water improvements (map 7.1, appendix G): Reliable water is often the limiting factor for when the Lop Ear allotment can be utilized. To improve the situation, 4 water related improvements are proposed:
    - Install approximately 1 mile of pipeline from a well on the permittees adjacent private land to a new storage tank and trough in the southwest corner of the allotment in T5S, R31E, Section 12 SW.
    - Install a 0.25-mile pipeline, storage tank, and trough in the Badlands pasture in T5S, R31E, Section 1 NE and T4S, R32E Section 31 SW.
    - Install a trick tank near Park Tank in T5S, R32E, Section 6 SE.
    - Install a water lot fence around Park Tank in T5S, R32E, Section 6 SE.

Specific proposed authorizations for allotments on the Gila National Forest are described below:

Alma Allotment (18,549 Acres) (Map 8, Appendix H)

Permitted numbers would remain at 300 cattle for up to 3,600 animal unit months. Season of use would be yearlong using a four pasture split-herd deferred-rotation system to provide periodic spring and summer growing season rest.

Livestock grazing would continue to be excluded from the San Francisco River through natural barriers or fencing except for a watering point up to 100 feet wide which is estimated to be less than 0.1 percent of the total linear miles of riparian habitat on the allotment. Access would be controlled and it would only be used when absolutely needed.

Proposed Improvements: To aid in livestock distribution and improve flexibility in timing, season and duration of use, the proposal includes the following:

Twin Sisters Waterline (Map 8.1, Appendix H)

- Currently the permittee is hauling water to an existing storage tank and trough in Twin Sisters Corral (#026) in T10S, R21W, Section 10, 11 and 12. It is proposed to install approximately 1.6 miles of pipeline from the existing Burns Well (#4225) to Twin Sisters Corral.

Cradle Mesa Fence (Map 8.2, Appendix H)

- Construct approximately 2.5 miles of fence to split the Cradle Mesa pasture in T10S, R21W, Section 4, 8, 9 and in T9S, R21W, Section 33 to create a Cradle Mesa pasture (western portion) and a Twin Sisters pasture (eastern portion).

Alma Allotment Water Lots

- Construct four water-lot fences around existing earthen tanks (ponds) to control access by livestock:
    - Middle Tank (#025) in T10S, R21W, Section 8 NE (map 8.2, appendix H)
    - Hobble Steer Tank (#011) in T10S, R21W, Section 4 NW (map 8.2, appendix H)

- Little Round Mountain Tank (#008) in T10S, R21W, Section 14 SW (map 8.1, appendix H)
- Hell Acre Tank (#031) in T10S, R21 West, Section 26 NW (map 8.1, appendix H)

Citizen Allotment (21,145 Acres) (Map 9, Appendix I)

Permitted numbers would remain at 424 cattle and 10 horses for up to 5,232 animal unit months. Season of use would be yearlong using a deferred-rotation system to provide periodic spring and summer growing season rest. Livestock grazing would continue to be excluded from the San Francisco River.

Webster Spring (Arizona portion of the allotment) (Map 9.1, Appendix I)

- Webster Canyon, located in the west-central portion of the allotment, has a dry canyon bottom with short sections where water trickles seasonally or where potholes remain with water during wetter periods of the year. Surveys in 2007 and 2017 report Webster Spring, which is in the upper reach of the canyon, to be functioning at risk. The spring development which is the main source of water for the area, would continue to be fenced to exclude livestock access. Three additional improvements are proposed to be installed in phases, based on monitoring, i.e. if monitoring shows implementing phase 1 is sufficient, the improvements listed in phases 2 and 3 would not be installed.
    - Phase 1: To improve livestock distribution and lessen the impacts in the Webster Spring area (T1S, R32E, Section 21), install a pipeline from Webster Spring (#160) approximately one mile down-canyon to an upland bench site and install a new trough and storage tank at the section line of T1S, R32E, Section 27/28.
    - Phase 2: Adjacent to and downstream of the spring exclosure are two small fenced holding traps. The proposal for phase 2 is to replace the short pipeline and troughs at the fenceline between the traps to provide access to water away from the canyon bottom and install a fence from the existing spring exclosure, down-canyon to the trap fence to exclude livestock from the canyon bottom in the first trap.
    - Phase 3: Extend the exclosure fence into the second trap, further downstream, excluding cattle from the drainage bottom while providing a gap where the trail crosses the canyon.

Bullard Canyon (Map 9.1, Appendix I)

- To aid in livestock distribution and improve flexibility in timing, season and duration of use, install approximately 1 mile of pipeline from Section 29 Spring (#4035), in the Arizona portion of the allotment in North Arizona pasture, to an upland site located in T1S, R32E, Section 33, in South Arizona pasture.

Snare Canyon (Map 9.1, Appendix I)

- Bury the existing pipeline from Cement Dam #4080 down Snare Canyon approximately 1.5 miles. T1S, R32E, Section 20 and 21.

Smoothing Iron (Map 9.2, Appendix I)

- To further aid in livestock distribution and improve flexibility in timing, season and duration of use, install three pipeline extensions from the Smoothing Iron Rim Tank water system (#206):
  - Approximately 1 mile pipeline extension to the west to a new trough in T11S, R21W, on the section line between Sections 29 and 32.
  - Extend a pipeline approximately 1.5 miles to the southeast to a new storage tank and trough in T12S, R21W, Section 3 NE.
  - Extend a pipeline, approximately ½ mile to two troughs, one on each side of the pasture division fence (#163) in T12S, R21W, Section 32.

Dry Creek Allotment (44,467 Acres) (Map 10, Appendix J)

Permitted numbers would remain at 275 cattle and 5 horses for up to 3,372 animal unit months. Season of use would be yearlong using a deferred-rotation system using the larger pastures to provide periodic spring and summer growing season rest. The remaining small pastures would be used at various times during the year as holding pastures to aid in livestock management. Livestock grazing will continue to be excluded from the San Francisco River, and approximately 1.3 miles of the lower portion of Big Dry Creek.

Whiterock Canyon (Map 10.1, Appendix J)

- To aid in livestock distribution and improve flexibility in timing, season and duration of use, the proposal is to install a well that would supply dependable water through a pipeline to storage tanks and troughs in two locations.
  - A storage tank and trough approximately 1 mile north of County Road 2-1 in T13S, R19W; Section 2, SW.
  - Extend a pipeline to a storage tank and trough approximately ½ mile to the southwest near National Forest System Road 4091, along the section line common to T13S, R19W, Section 3 SE and Section 10 NE.

Holt Gulch Allotment (15,765 Acres) (Map 11, Appendix K)

Permitted numbers would remain at 150 cattle and 3 horses for up to 1,843 animal unit months. Season of use would be yearlong using a deferred-rotation system to provide periodic spring and summer growing season rest. No new range improvements are proposed.

Pleasanton Allotment (28,393 Acres) (Map 12, Appendix L)

Permitted numbers would change slightly from 499 cattle and 13 horses year-round to 500 cow-calf pairs and 12 horses for up to 6,173 animal unit months. Season of use would continue to be yearlong using a deferred-rotation system to provide periodic spring and summer growing season rest. Livestock grazing would continue to be excluded from the San Francisco River.

Lloyd and Powerline (Map 12.1, Appendix L)

- To improve management flexibility on the allotment and improve livestock distribution, particularly in the Pine, Lloyd, and Powerline pastures, install a new well in Pine pasture and extend pipelines and associated storage tanks and troughs to the Lloyd and Powerline pastures. Approximate location of the well would be T12S, R21W, Section 1 SE with approximately 8.2 miles of pipeline, 2 storage tanks and 6 troughs in T12S, R21W, Sections 1 2, 3, 9, 10, 11, 12, 15 and 16.

Potholes Allotment (7,432 Acres) (Map 13, Appendix M)

Current permitted numbers are 195 cow-calf pairs from November 16 to April 15 and 80 cow-calf pairs from June 16 to November 15. This would change to 114 cattle and horses with a year – round season of use using a deferred-rotation system to provide for periodic spring and summer growing season rest. The current permitted animal unit months would remain the same at 1,370 animal unit months.

The proposed change would provide more flexibility in responding to changing conditions, while providing plant rest and recovery. Livestock grazing would continue to be excluded from the San Francisco River through natural barriers or fencing.

No new range improvements are proposed.

Sacaton Allotment (6,632 Acres) (Map 14, Appendix N)

Permitted numbers would remain at 130 cattle for up to 906 animal unit months on the allotment with up to 836 animal unit months or 92 percent occurring on the National Forest System portion of the allotment and the remaining 70 animal unit months or 8 percent occurring on the waived private lands portion of the allotment. Season of use would be for up to 7 months each year from December 1 through June 30.

Approximately 1.8 miles of the upper section of Sacaton Creek would continue to be excluded from livestock grazing by natural barriers and fencing. One short exclusionary fence is proposed for protection of a cultural resource site.

Monitoring Requirements for all Allotments

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 identified for the project area. There are two types of monitoring: implementation and effectiveness.

Implementation Monitoring

Per handbook direction, implementation monitoring would occur on an ongoing yearly basis and may include, but not be limited to, such items as 1) actual use in each pasture; 2) condition of range improvements; 3) seasonal utilization, annual utilization, or stubble heights; or 4) other annual monitoring that may be important in site-specific situations (R3 supplement, Forest Service Handbook 2209.13, chapter 90, 2016).

Utilization measurements are made following procedures found in:

- the Rangeland Analysis And Management Training Guide (USDA Forest Service 2013);
- the Utilization Studies And Residual Measurements Technical Guide (Cooperative Extension Service and others 1996, revised 1999); and
- the Principles of Obtaining and Interpreting Utilization Data on Rangelands (Smith et al. 2007).

Utilization would be monitored on key forage species that are palatable to livestock and whose use serves as an indicator of the degree of use of associated species. They are species which, because of their importance, are considered in the management program. Utilization of key forage species may be monitored through a pasture-wide reconnaissance or measured in key areas. Utilization on nongrass species (forbs, shrubs, and trees) may also be measured if appropriate for the site, such as monitoring use on riparian browse.

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.

Effectiveness Monitoring

Long-term monitoring documents whether management actions are having the expected maintenance of, or progress towards, achieving resource management objectives and may be both qualitative and quantitative. Effectiveness monitoring would typically occur at 5-year to 10-year intervals but may occur more often as needed.

Examples of effectiveness monitoring include, but are not limited to, dry weight rank, pace transects, line intercept, pace quadrat frequency, cover frequency, terrestrial ecosystem surveys, riparian surveys, soil and watershed condition assessments and repeat photography. Monitoring typically occurs at established permanent monitoring points.

Monitoring may follow procedures described in, but not limited to, the following:

- the Interagency Technical Reference (Cooperative Extension Service et al. 1996, revised 1999)
- the Rangeland Analysis and Management Training Guide (USDA Forest Service 2013)
- the Region 3 Stream Inventory Handbook and the Riparian Area Survey and Evaluation System (RASES)
- Appendix H of the Region 3 cultural resources programmatic agreement (USDA Forest Service 2007)

Permittees would be encouraged to participate in implementation and effectiveness monitoring activities.

Affected Environment and Environmental Impacts

This section is organized according to the issues or topics of concern as identified in the “Public Involvement” section. It summarizes the affected environment or current condition of each issue or topic and discloses the potential impacts of the alternatives.

Current conditions are affected by multiple factors and uses such as travel management involving road and trail use and maintenance, fire management including wildfires and prescribed burning, flooding, livestock use, recreation, climate change and so forth.

Rangeland Resources

Rangeland resources involves all of the uplands to include the nonriparian areas. This section is divided into rangeland vegetation (upland vegetation) and livestock grazing management. The effects to the rangeland vegetation is disclosed as expected changes in the rangeland vegetation trend, ground cover trend and the potential for noxious weed spread. Livestock grazing management is being used here to include how livestock would graze the area, that is, expected changes in the number of cattle authorized, season of use and grazing systems.

Affected Environment

The project area is represented by various cover types with grasslands and juniper and pinyon woodlands being the most dominate. The "Range" report, available in the project record, details the general description.

For both national forests, the overarching desired condition is for rangeland conditions to be stable or improving. Rangeland conditions are considered stable or improving when species composition and site protection indicators (such as ground cover) are similar to what is expected for the site based on soil type and the current understanding of plant community dynamics, or exhibit an upward trend. As described in the existing condition report, desired conditions are being met relative to plant communities and ground cover with one exception (monitoring site C4[9] on the Hickey allotment).

Additionally, specific to the Apache-Sitgreaves National Forests, the standard is for the plant composition to exhibit a moderate to high plant community similarity as compared to site potential. The exception is sites with satisfactory ground and vegetation cover but have crossed a threshold to a stable state with low potential to move towards potential natural community. The areas include:

- Alma Mesa allotment – C1 and C4 monitoring sites.
- Blackjack allotment – C1 and C5 monitoring sites.
- Hickey allotment – C2 and C3 monitoring sites.

Rangeland vegetation trend and ground cover trend were used as indicators of meeting or progressing towards management objectives. Monitoring data collected at 69 long-term monitoring sites indicate that, for the most part, upland conditions on the allotments either meet or are moving towards achieving the objectives in the forest plans.

[9] Monitoring sites are composed of a cluster of multiple transects. Each cluster is referred to by its established number for each allotment (that is, cluster 1 or simply C1) and transects are referred to by its cluster number and transect number (that is, C1T1 is transect number 1 within cluster number 1). Because transects are permanently established, the attributes can be measured repeatedly over time.

Table 6 displays a summary of the existing conditions, by resource indicator and measure. Trend is one of the measures to compare existing vs. desired conditions and to determine environmental effects. There are three categories for trend. Toward desired is synonymous with upward or improving trend. Static is stationary or stable. Away from desired is synonymous with downward or declining trend.

Table 7 illustrates the number of monitoring sites and apparent vegetation and ground cover trend for each allotment.

Livestock Management and Associated Improvements

Current allotment management practices are summarized in table 8, by allotment. Utilization monitoring and production or utilization studies indicate that management of the allotments by adjusting authorized numbers annually based on monitoring, up to the current permitted numbers, is in balance with capacity, as detailed in the range specialist report. For some allotments, two periods are used to show the variation of average actual use.

Because of the size of the project area, there are multiple maps showing existing and proposed improvements. The maps are organized by allotment and are in appendices A through N. The appendices are not included in this document but are available on request or on the project webpage at https://www.fs.usda.gov/project/?project=22466.

Table 6. Resource indicators and measures for the existing condition

Resource Element	Resource Indicator	Measure	Existing Condition
Rangeland vegetation	Rangeland vegetation trend	Trend: toward desired plant community, away from desired plant community, or static	Rangeland vegetation trend determinations, project-wide, are either static or moving toward desired with 1 of the 69 transects indicating static to trending slightly away from desired. Twenty-eight monitoring sites (41 percent) indicate a static trend and 40 (58 percent) indicate an upward trend.
Rangeland vegetation	Ground cover trend	Trend: toward desired ground cover, away from desired ground cover, or static	Ground cover trend determinations, project-wide, are either static or moving toward desired with 1 of the 69 transects indicating static to trending slightly away from desired. Thirteen monitoring sites (19 percent) indicate a static trend and 55 (80 percent) indicate an upward trend for ground cover.
Rangeland vegetation	Noxious weed spread	Qualitative assessment of expected increase or decrease in weed infestations	Most of the known noxious weeds in or near the project area are along the San Francisco corridor; other than the river corridor there is a small occurrence known on the Citizen allotment and one near the Holt Gulch allotment.
Livestock grazing management	Authorized livestock use	Potential to affect livestock operations, including number of cattle authorized and grazing system	Permitted numbers for each allotment are listed in table 8 below. Most allotments are managed under a rotational grazing system to allow for periodic rest of each pasture. Two allotments are permitted during dormant season use only. Actual use has varied from non-use to full numbers with most averaging between 61 percent and 87 percent of permitted.

Table 7. Rangeland vegetation and ground cover trend determinations

Allotment	Number of Monitoring Sites	Rangeland Vegetation Trend	Ground Cover Trend
Alma Mesa	1	Static	Static, slightly toward desired
Alma Mesa	2	Static	Toward desired
Alma Mesa	4	Toward desired	Toward desired
Blackjack	1	Static, slightly toward desired	Static, slightly toward desired
Blackjack	2	Toward desired	Toward desired
Blackjack	1	Static	Toward desired
Copperas	1	Static	Toward desired
Copperas	1	Static, slightly toward desired	Static
Copperas	1	Toward desired	Static
Hickey	2	Static	Static
Hickey	1	Static, slightly away from desired	Static, slightly away from desired
Hickey	1	Toward desired	Toward desired
Keller Canyon	1	Static, slightly toward desired	Toward desired
Keller Canyon	1	Toward desired	Toward desired
Lop Ear	2	Static	Toward desired
Pleasant Valley	1	Toward desired	Toward desired
Pleasant Valley	3	Toward desired	Static
Pleasant Valley	1	Toward desired	Static, slightly toward desired
Alma	1	Static	Static
Alma	3	Static	Toward desired
Alma	3	Toward desired	Toward desired
Citizen	3	Toward desired	Toward desired
Citizen	2	Static	Toward desired
Citizen	2	Static, slightly toward desired	Toward desired
Dry Creek	2	Static	Toward desired
Dry Creek	5	Toward desired	Toward desired
Dry Creek	1	Static	Static
Holt Gulch	1	Static, slightly toward desired	Toward desired
Holt Gulch	3	Toward desired	Toward desired
Holt Gulch	2	Static	Toward desired
Holt Gulch	1	Static	Static
Pleasanton	1	Static	Toward desired
Pleasanton	6	Toward desired	Toward desired
Potholes	3	Toward desired	Toward desired
Sacaton	3	Toward desired	Toward desired

Table 8. Current livestock grazing management by allotment.

Allotment	Existing Term Grazing Permit	Current Grazing System	Average Actual Use
Alma Mesa	682 cow-calf pairs and 18 horses, yearlong (8,443 animal unit months)	The allotment is managed by rotating through pastures for periodic summer growing season rest (a minimum of once every 2 to 4 years). The smaller pastures are used for holding, doctoring, horses, or a combination of these things. The Bear Valley pasture is used primarily during the dormant season	2002 to 2016 – 2,680 animal unit months, 32% of permitted. 2015 and 2016 - 7,121 animal unit months, 84% of permitted.
Blackjack	325 cow-calf pairs and 15 horses, yearlong (4,116 animal unit months)	For the past several years, the Coal Creek, White Peaks, and Maverick pastures have been rested or stocked very lightly, with most use occurring in the large Beefeater pasture. In 2016 and 2017, the Lightning Mesa, Dix Mesa, and Dix Saddle pastures of the adjacent (vacant) Pleasant Valley allotment were incorporated into the grazing rotation on a trial basis.	2002 to 2010 – 1,159 animal unit months, 28% of permitted. 2011 to 2016 – 4,061 animal unit months, 99% of permitted.
Copperas	135 cow-calf pairs, yearlong, 40 yearlings January through October, 46 yearlings January through May and 4 horses, yearlong, (2,117 animal unit months)	There are three main pastures—Coalson, Bullard and Breeding—but for the recent past Coalson and Bullard have been combined into one unit. A deferred grazing system has been used since 2015, with the Coalson/Bullard pasture being used March through June and the Breeding pasture used July through February. The Bullard Trap and Copperas Trap pastures receive incidental use. In 2013 and 2014, both main pastures were grazed yearlong, by a reduced number of cattle. From 2006 through 2012, the Coalson/Bullard pasture was used predominantly from October through April and the Breeding pasture was used May through September.	2002 to 2016 - 1,295 animal unit months, 61% of permitted
Hickey	405 cow-calf pairs and 8 horses, yearlong (4,975 animal unit months)	In 2014 and 2015, small groups of cattle were scattered in each of the main pastures yearlong. In 2016, two pastures from the adjacent Pleasant Valley allotment were added to the rotation system (Pleasant Valley and Hamilton Mesa pastures), allowing some deferment during the growing season. In 2017, the Johnnie pasture of the Pleasant Valley allotment was added to the rotation, allowing an increase in cattle numbers to 269 head total (which is still below the permitted 405 cow-calf pairs).	From 2002 through 2011, the allotment was rested for 7 years and for 3 years, it was stocked at less than 653 animal unit months. From 2012 to 2017, actual use averaged 1,808 animal unit months or 36% of permitted.

Allotment	Existing Term Grazing Permit	Current Grazing System	Average Actual Use
Keller Canyon	70 cow-calf pairs, Sept. - March 1, (419 animal unit months) for the forest portion (70%) and 180 animal unit months for the private land (30%) portion for a total of 599 animal unit months.	Since 2006, the Keller Canyon allotment has been managed in conjunction with privately owned lands, with the grazing rotated through the pastures for deferment during a portion of the growing season. The permitted numbers have varied since 2006 as Apache-Sitgreaves personnel used a stock and monitor approach to establish an appropriate stocking level after splitting the allotment from the larger Alma Mesa allotment. Since 2012, the allotment has been used year-round on a temporary trial basis.	2006 to 2011 – 294 animal unit months, 62% of permitted. 2012 to 2016 –511 animal unit months, 85% of permitted.
Lop Ear	60 cow-calf pairs from Nov. 1 - April 30, and 30 cow-calf pairs from May 1 through Oct. 31, (539 animal unit months)	Currently grazed in conjunction with private, State and Bureau of Land Management lands. A rotation schedule is developed yearly during the annual operating instruction meeting. Grazing has not been authorized on a yearlong basis since 2004	2002 to 2016 – 367 animal unit months, 68% of permitted
Pleasant Valley	There is no term grazing permit on this allotment, the last grazing permit was cancelled in 2004.	The Pleasant Valley allotment was rested from 2006 through 2015. Since 2016, it has been used on a trial basis in conjunction with the Hickey and Blackjack allotments as part of their deferred rotation systems.	2002 to 2005 - 2,652 animal unit months. 2006 to 2015 – Rested. 2016 to present – used with Hickey and Blackjack Allotments.
Alma	300 cattle yearlong, (3,600 animal unit months)	The allotment is currently managed using a split-herd, deferred-rotation grazing system. The established rotation allows for two of the three main pastures to be deferred during the growing season. There are also five large (less than 700 acres) and four small (less than 150 acres) holding pastures used throughout the year for breeding, calving, hospital, shipping, weaning, etc.	2005 to 2016 - 3,046 animal unit months, 78% of permitted
Citizen	424 cattle, and 10 horses yearlong (5,232 animal unit months)	The allotment is currently managed by rotating the cattle through the six main pastures for periodic summer growing season rest (a minimum of once every 2 to 4 years). The smaller pastures are used for holding, doctoring, horses, or a combination of these things. Pasture use varies from year to year.	2005 to 2016 - 3,989 animal unit months, 76% of permitted
Dry Creek	275 cattle, 5 horses, both yearlong (3,372 animal unit months)	Currently managed using an eight-pasture, deferred-rotation grazing system, with cattle rotating through the pastures in response to forage availability. Pasture use varies from year to year.	Allotment was not stocked from 2005-2007. 2008 to 2016 – 2,805 animal unit months, 83% of permitted.

Allotment	Existing Term Grazing Permit	Current Grazing System	Average Actual Use
Holt Gulch	150 cattle, yearlong; 3 horses, March 1 to October 31 (1,843 animal unit months)	Currently, one of the two large pastures on the allotment is grazed during the winter, while the other large pasture and five smaller pastures are grazed during the summer with increments of rest. One of the five smaller pastures is used as a horse pasture periodically. Pasture use varies from year to year.	2005 to 2016 –913 animal unit months, 50% of permitted
Pleasanton	499 cattle and 13 horses, yearlong (6,173 animal unit months)	Currently managed under continuous, yearlong grazing due to nonfunctional improvements. 2013 memorandum of understanding says nonuse up to 100 percent per year may be authorized until the improvements have been returned to functional condition.	2005 to 2016 - 2,886 animal unit months, 47% of permitted
Potholes	195 cow-calf pairs November 16 to April 15 and 80 cow-calf pairs June 16 to November 15 (1,370 animal unit months)	2013 memorandum of understanding limits the authorized grazing use of the allotment to 80 cow-calf pairs from June 16 to April 15, until range improvements are functioning. The East and West pastures are utilized from June 16 to April 15, with cattle distributed throughout both pastures; grazing is authorized on the smaller holding pastures and traps yearlong until allowable use is reached.	2005 to 2016 - 920 animal unit months, 67% of permitted
Sacaton	Term permit - 120 cattle, December 1 - June 30 (836 animal unit months) Term private land permit - 10 cattle, December 1 - June 30 (70 animal unit months)	This is a single-pasture allotment; no cattle are grazed on the allotment from July 1 through November 30, allowing for summer and fall growing season deferment every year	2005 to 2016 - 723 animal unit months, 87% of permitted (both permits)

Environmental Consequences

Direct and Indirect Effects of Alternative 1 – No Grazing

Under this alternative, grazing would not be permitted and use of the allotments by domestic livestock would be discontinued.

By definition, direct and indirect effects (40 CFR 1508.8), and cumulative effects (40 CFR 1508.7) result from the proposed action, and thus are not germane to the no action alternative. However, removing livestock grazing from the project area would be a change from current management and result in effects to the range resource elements.

Under this alternative, there would be no permitted grazing on the National Forest System lands within the project area; no new term grazing permits for domestic livestock grazing would be issued, resulting in a 100 percent reduction in the existing permitted livestock use. Most range improvements currently in existence on the allotments would be abandoned.

Subsequent administrative decisions would need to be made regarding retention of any improvements, such as water developments for other resource needs. Periodic inspections of structural improvements would be used to determine whether maintenance or removal is needed.

Livestock grazing results in direct impacts of defoliation to individual plants and an alteration of canopy structure to the plant community. Plant reactions to those direct impacts depend on the ability of the plants to compensate for defoliation and the relative impact of the removal. In general, the replacement of tall grasses, midgrasses (such as sideoats grama), or both by shortgrasses (such as curly mesquite) is a common response to grazing pressure across plant communities worldwide (Michlunas and Lauenroth 1993). With the removal of grazing pressure, the initial response is expected to be the reverse: an increase in the amount of tall grasses, midgrasses, or both and a decrease in the amount of shortgrasses. However, as Ruyle and Dyess (2010) summarize, vegetation changes occur as a result of many factors other than grazing, and disturbance is a natural feature of plant communities. Thus, removing grazing does not automatically result in a return to previous conditions.

In some areas, the altered plant communities can no longer achieve what may have been historic conditions. As noted in the long-term trend data, many of the plant communities in the project area are in stable states with botanical compositions that have remained static for decades. The botanical composition of those plant communities would likely remain very similar to what is currently present in the plant communities that have crossed a threshold despite removal of grazing animals. Although these may have crossed a threshold, overall the vegetation and ground cover provide satisfactory conditions and exhibit static or upward trends which would likely continue.

Ground cover is expected to increase across the project area, even in areas where the botanical composition is likely to see little change. Without livestock grazing removing plant biomass, the forage plants in the uplands would retain several years' growth as a standing crop of litter. However, as noted in the proposed action effects analysis below, removing livestock grazing does not always result in an increase in cover (Loeser et al. 2007, Molinar et al. 2011). Decreases in any livestock-induced compaction would improve infiltration, fluid and gas exchange, and soil water-holding capacity, resulting in increased rooting depth and vigor of existing grass plants. Microbiotic crusts, although limited in distribution and quantity, are expected to increase, helping to increase the available nitrogen and other nutrients in the soil. All of these changes would result in more ground cover and ultimately result in a trend toward desired for vegetative ground cover.

Noxious Weeds - There are currently very few occurrences of noxious weeds within the project area. Most occur in the San Francisco River corridor, which is excluded from grazing. Keeping noxious weeds from being introduced into new areas is the most effective management strategy for preventing or reducing their spread. By removing all livestock grazing from the allotments, the potential for the introduction of new noxious weed infestations, as well as the potential for spread of existing infestations, is reduced.

Direct and Indirect Effects of Alternative 2 – Proposed Action

For this and subsequent resources, the environmental consequences of the proposed action for those areas currently on the Pleasant Valley allotment will be disclosed under closed areas or under the Blackjack or Hickey allotment, depending on which allotment portions of the Pleasant Valley allotment are proposed to be added to or excluded from grazing.

Rangeland Vegetation

As discussed under the no-action alternative, livestock grazing results in direct impacts of defoliation to individual plants and an alteration of canopy structure to the plant community. However research has shown that with properly managed livestock grazing, forage plant health and productivity, and overall ecological condition of rangelands can be improved or maintained. (Holechek et al. 2004, Loeser et al. 2007, Molinar et al. 2011, and Holechek et. al 2003).

The proposed action is similar to current management and the existing conditions are a result of that management. Therefore, overall, the stable and upward trends in plant communities and ground cover are expected to be similar to the existing condition, particularly on the Holt Gulch, Potholes, and Sacaton allotments where no new improvements are proposed except for one short exclusion fence for cultural resource concerns.

Specific sites could benefit from proposed improvements. As described in the proposed improvements section above, some improvements are required on the Blackjack, Citizen, and Hickey allotments for grazing to occur or not be limited in some areas.

Additional improvements are proposed for the other allotments in accordance with monitoring, funding, and priorities. If monitoring shows conditions moving away from desired, the adaptive management component of the proposed action allows for management changes to correct the trend.

Livestock Grazing Management

Implementing the grazing strategies included in the proposed action, helps provide grazing management flexibility. Providing grazing management flexibility is expected to help maintain the current authorized use levels or move them closer to the permitted use levels, while still meeting management objectives. The following allotments have additional allotment-specific effects due to differences in their respective existing conditions or because the proposed management differs from what has been occurring on the allotment in the recent past.

Alma Mesa Allotment

The proposed action includes using the Bear Valley pasture primarily during the dormant season between October 1 and April 30 to help alleviate grazing pressure in a sensitive area. This restriction is not expected to affect the livestock grazing management unduly nor affect permitted numbers.

Monitoring data indicates the plant community at cluster 5 (North Stateline pasture) may not have crossed a threshold and be susceptible to improvement. Incorporating the adaptive management component is expected to help move that plant community more toward potential natural community and exhibit upward trend.

Blackjack Allotment

The proposed action includes adding four pastures and sharing the use of Johnnie Trap from the Pleasant Valley allotment. The permitted animal unit months would increase commensurate with the increased size of the allotment after two identified water developments and the fence along Dix Creek are installed and based on monitoring. In addition, the allotment boundary change increases the management flexibility on the allotment, including being able to restrict livestock use in sensitive areas.

Coupled with the proposed structural range improvements on the allotment, these changes are all expected to enhance the livestock management, allowing the implementation of a grazing strategy that includes stocking the allotment near permitted levels while not exceeding grazing intensity guidelines.

Copperas Allotment

The proposed action includes some management changes, in addition to possible new structural range improvements as described in the proposed action above. These changes would help alleviate grazing pressure in sensitive areas and help maintain the current permitted numbers while not exceeding grazing intensity guidelines.

Hickey Allotment

The proposed action includes altering the allotment boundary of the Hickey allotment by including three pastures and sharing the use of Johnnie Trap from the Pleasant Valley allotment. This would increase the size of the allotment and improve management flexibility. Removing the San Francisco and Bird Trap pastures from the allotment is not expected to affect grazing management, as livestock grazing has been excluded from the those two pastures for a number of years. Permitted numbers would remain the same.

The plant community and ground cover at cluster 4 (Silver Basin pasture) are trending slightly away from desired. Increasing the size of the allotment by incorporating pastures from the neighboring Pleasant Valley allotment (without increasing the stocking level), utilizing water lots to control livestock use around Cave Spring and Silver Basin Tank, and including the adaptive management component of the proposed action increases the flexibility for management on the Hickey allotment. This increased flexibility increases the probability of moving the plant community and ground cover toward desired. This would help improve conditions at this site and across the allotment.

Keller Canyon Allotment

The proposed action includes changing the season of use to yearlong on the Keller Canyon allotment. This change, and proposed water improvements, would increase the livestock grazing management flexibility on the allotment by allowing use during appropriate times. Grazing could occur based on conditions on the ground rather than being restricted to a particular date. Transferring the administration of the allotment to the Glenwood Ranger District on the Gila National Forest is not expected to have any effects on the livestock grazing management, other than making it easier for the permittee and Forest Service staff to coordinate.

Citizen Allotment

The proposed action includes structural range improvements in Webster Canyon designed to help alleviate grazing pressure on the Webster Spring area. The initial action would make water available to livestock outside the area with additional phases planned as needed (if Webster Spring continues to be rated as functioning at risk, and livestock are a causal factor). By designing the proposed improvements to provide a gap where livestock could trail through with the remainder of the area within the traps remaining available for gathering and holding livestock, the affects to the livestock management in the area are expected to be slight.

Dry Creek Allotment

For the proposed well and storage tank and troughs in Whiterock Canyon, some trees which have overgrown into the existing roadbed would need to be cut, and following installation, some minor repairs to the roadbed may be needed. The road used to access the proposed well site is managed for administrative use or use by written authorization. The amount of work necessary to get the road in condition to allow access for well drilling equipment would not be in excess of the original management level of the road.

Pleasanton Allotment

Due to needed structural improvement repairs, for the past several years, the allotment has had continuous, yearlong grazing with a stocking level low enough to ensure conservative utilization levels are not exceeded. Now that the repairs are nearing completion, the proposed 6-pasture, split-herd, deferred-rotation system may soon be implemented to provide periodic spring and summer growing season rest. Ensuring periods of rest while maintaining conservative use levels should maintain or improve current conditions and trends.

Potholes Allotment

The proposed action includes changing the permitted numbers from 195 cow-calf pairs from November 16 to April 15 and 80 cow-calf pair from June 16 to November 15 to 114 cow-calf pairs (or equivalent by other combination or class of cattle and horses) yearlong, for up to 1,370 animal unit months. While this is a change in the permitted numbers, the animal unit months remains the same. This change would provide more flexibility in the livestock grazing management.

The grazing system proposed also differs from what has occurred on the allotment for the past several years. The disrepair of structural range improvements on the allotment in the recent past has resulted in continuous, yearlong grazing with a stocking level low enough to ensure the conservative utilization level is not exceeded. Under the proposed action a two pasture deferred rotation system is proposed. It is expected that actual use would move closer to the permitted level without exceeding the grazing intensity guideline.

Noxious Weeds

With livestock grazing, there is always the potential for the introduction of invasive, nonnative plants. Weeds may be introduced through livestock management activities that bring seeds or plant parts into previously uninfested areas.

Although feeding of hay or other feed would be limited to occasional use for livestock confined to corrals, it could be an avenue for new weed infestations. Per “Guidelines for Weed-Free Seed, Forage, Mulch, and Fill Material in Region 3” (USDA Forest Service 2017), permittees should be encouraged to use a commercially processed feed or a certified weed-free forage since the region currently does not have a weed-free order for animal forage. This is no change from current management. Structural improvements are periodically inspected and new infestations would be treated as has effectively occurred in the past. Per Apache-Sitgreaves forest plan direction, treatment efforts are focused in areas with concentrated use such as corrals.

Because the known occurrences in, or close to, the project area are small or located in areas that would continue to be excluded from grazing, there is low risk of the proposed action contributing to the spread of noxious weeds.

Cumulative Effects

Ongoing and reasonably foreseeable activities relevant to rangeland vegetation and livestock grazing management are recreation, firewood cutting, juniper removal projects, prescribed burning, and noxious weed treatment. While drought isn't a management activity per se, our reaction to drought is; therefore it is included in this brief discussion

Recreation can result in a disturbance of the rangeland vegetation. Unauthorized roads compact soil, with detrimental effects to vegetation and an increase in erosion. Recreation can affect livestock management if gates are inadvertently left open, making it difficult to keep cattle in the authorized areas.

Firewood cutting can have a beneficial impact on the rangeland vegetation when the canopy is opened up. It can also have a localized negative short-term impact if it results in soil disturbance, compaction of soil or impacting or removal of rangeland vegetation.

Although prescribed burns and vegetation treatment projects can have short-term negative impacts by altering grazing rotations, soil disturbance and impacts to rangeland vegetation, they typically result in overall long-term beneficial effects on the rangeland vegetation.

Continued monitoring and treatment of noxious weeds would help maintain the current plant communities.

Drought, and management reaction to drought, can result in changes to the rangeland vegetation and livestock grazing management. Plants respond to drier and hotter conditions, resulting in less forage in addition to a likely decrease in livestock water availability. The reduction in the amount of forage and water available can make livestock management difficult, with operators needing to remove cattle from the National Forest System lands, or make changes to planned grazing systems.

Alternative 1 – No Grazing

There would be no management activities proposed under the no-action alternative, yet there are effects expected from this lack of action. Those effects identified, when combined with the effects from other present and foreseeable future activities would not likely add incrementally to a change in the plant communities. Also, the amount of forage available for livestock grazing on each district would be reduced.

Alternative 2 – Proposed Action

Because the effects to the rangeland vegetation from the proposed action are slight, the proposed action is not expected to add incrementally to the impacts to the plant communities discussed above. The proposed action is expected to improve livestock management while reducing the total permitted use in the project area by approximately 3 percent. So it would add incrementally but not substantially to the impacts to livestock grazing management discussed above.

Table 9. Summary comparison of environmental effects to range resources

Resource Element	Resource Indicator	No Action, No Grazing	Proposed Action
Rangeland vegetation	Rangeland vegetation trend	Overall expected to remain static or continue moving toward desired	Overall expected to remain static or move toward desired plant community, resulting in satisfactory conditions and meeting desired conditions.
Rangeland vegetation	Ground cover trend	Overall expected to move toward desired	Overall expected to remain static or move toward desired ground cover, resulting in satisfactory conditions and meeting desired conditions.
Rangeland vegetation	Noxious weed spread	By removing all livestock grazing from the allotments, the potential for the introduction of, or spread of, noxious weeds is reduced.	Very little risk of the proposed action contributing to the spread of noxious weeds.
Livestock grazing management	Permitted livestock use	Permitted use would be reduced from 39,786 animal unit months to zero.	Permitted numbers would decrease by 3 percent (1,277 animal unit months). Actual use is expected to remain at or gradually increase above recent levels.

Soil and Watershed Condition

Affected Environment

Soils

Soil condition is categorized by four classes: satisfactory, impaired, unsatisfactory, and inherently unstable. Trend is used as an attribute to supplement the overall assessment of soil condition. Trend represents the general direction in which something may be developing or changing and described as being upward, downward, or stable. Trend determination is based on the state of physical indicators that assess three primary soil functions (hydrologic function, stability, and nutrient cycling), ground cover, and vegetative cover and their relationship to the desired condition.

Each pasture within the project area was visited in 2016 and 2017 and upland soil and watershed conditions evaluated (see “Watershed” report in the project record). Overall, soil conditions were found to be satisfactory across the majority of the project area. Satisfactory soils are those that are functioning properly and normally within their potential capability. Generally, adequate vegetative cover is in place, and soil movement does not appear to be over natural levels. The trend of vegetation cover, litter, and percent bare soil is stable to upward on most monitoring sites. There are isolated occurrences, mainly near upland water sources, of bare soil exposure and compaction.

In general, soils show little sign of adverse compaction, displacement, or loss of productivity due to livestock impacts as part of the current grazing management. Gully or rill erosion is only observed in isolated areas. Limited and scattered amounts of biological or microbiotic soil crusts are found across the project area. Total ground cover from vegetation, litter, and duff in upland areas is good overall.

Exceptions are observed in:

- Pleasant Valley allotment – Mesquite Pasture soil conditions are considered impaired and inherently unstable. Impaired soils exhibit an observable or measureable reduction in soil function and inherently unstable soils are generally eroding faster than they are renewing themselves. Historical grazing may have had an impact in this area by causing a shift to mesquite shrubs as the dominant plant species. A dominance of mesquite shrubs may have reduced herbaceous species cover, which can lead to the higher rates of erosion.
- Blackjack allotment - Soils along the channel in Rattlesnake Canyon showed areas of impaired condition but were not formally surveyed. However, the results are captured in the proper functioning condition information below.
- On some monitoring sites across the project area, vegetation cover has not increased or has declined since the 1950s or in recent years and could affect future soil conditions.

Riparian Areas

Riparian areas found within the Stateline project area were evaluated from 2016 into early 2018 using the proper functioning condition protocol (USDI Bureau of Land Management 2015) to determine both riparian potential and functionality. Stream reaches receiving either a proper functioning condition rating or a functional at risk – upward trend rating are considered to be in satisfactory condition and meeting or moving towards forest plan standards and guidelines. Reaches receiving either a functional at risk – stable or downward trend or nonfunctional rating are considered to be in unsatisfactory condition.

Of the 51 surveyed reaches, 43 were determined to be functioning properly. Two reaches (Lower Coalson on the Copperas allotment and Little Whitewater on the Holt Gulch allotment) were functioning at risk with an upward trend. Six were functioning at risk with no apparent trend and no reaches were rated as impaired function.

The six reaches functioning at risk with static trend are:

- Alma Mesa Allotment - Dutch Blue Creek.
- Blackjack Allotment - Rattlesnake Canyon and Rustler Canyon.
- Copperas Allotment – Upper Coalson and Lower Bullard.
- Citizen Allotment – Webster Spring.

Within the project area watersheds, there are four individual segments listed on either the Arizona or New Mexico 303(d)(1) list. These are shown in table 10.

Table 10. Impaired waterbodies within the Stateline project area

Stream Reach	Forest	Miles	Reason for listing	TMDL
Blue River, From Strayhorse Creek to San Francisco River	A-S	25.1	*E. coli* from pathogens	Needed
San Francisco River from Blue River to Limestone Gulch	A-S	19.4	*E. coli* from pathogens	Needed
Gila River, From Skully Creek To San Francisco River	A-S	11.2	Selenium (metals)	Needed
San Francisco River, From Dry Creek To Whitewater Creek	Gila	8.9	Benthic macroinvertebrates bioassessments (cause unknown)	Needed

A-S = Apache-Sitgreaves National Forest; G = Gila National Forest; TMDL = total maximum daily load

Watershed Condition

Assessment of overall watershed condition was analyzed at the 6th hydrologic unit code watershed level (6th-level watershed). This refers to watersheds of a specific size, which, on average, are generally 40 square miles or approximately 25,600 acres. They generally contain one or more smaller drainages.

Project area watershed boundaries were identified from the Apache Sitgreaves and Gila National Forests corporate geographic information system (GIS) datasets. For hydrological analyses purposes, watershed effects were evaluated and presented for each 6th-level watershed involved with the project area. Watersheds were considered to be associated with the Stateline Project if any portion of their land base was located in the defined project area boundary (allotments). The project area lies within portions of twenty-six 6th-level watersheds on the Apache-Sitgreaves National Forests and eighteen 6th-level watersheds on the Gila National Forest.

Forest Service Manual 2521.1 provides direction to establish watershed condition ratings. In 2011, the watershed classification and assessment tracking protocol (USDA Forest Service 2011) was used to determine the health of 6th-level watersheds.

Watershed condition assessment is the process of describing watershed condition in terms of three discrete classes that reflect the level of watershed health. Primary emphasis is placed on indicators that directly or indirectly impact soil and hydrologic functions and riparian and aquatic ecosystems. These include past and current resource management activities (grazing, vegetation management, roads, recreation, etc.) and natural events and conditions (wildfire, climate change, flooding, etc.).

Watershed condition classes (table 11) are determined through a process where a series of attributes are rated and averaged for each indicator of watershed health. The watershed condition class is determined by adding together weighted averages with a rating of either watershed condition class 1 – functioning properly, watershed condition class 2 – functioning at risk or watershed condition class 3 – impaired function.

Table 11. Summary of watershed condition classes and definitions

Watershed Condition Class (WCC)	Watershed Condition Class Definition
WCC 1 (functioning properly - good)	Watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. The drainage network is generally stable. Physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems are predominantly functional in terms of supporting beneficial uses.
WCC 2 (functioning at risk - fair)	Watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. Portions of the drainage network may be unstable. Physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems are at risk in being able to support beneficial uses.
WCC 3 (impaired function - poor)	Watersheds exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition. A majority of the drainage network may be unstable physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems do not support beneficial uses.

Results from the analysis indicate project area watersheds associated with the Apache Sitgreaves National Forests are functioning at risk except for Dutch Blue Creek, Oak Creek-Blue River, Pine Cienega Creek, and Sardine Creek watersheds which are all functioning properly.

Results from the analysis indicate most project area analysis watersheds associated with the Gila National Forest are functioning at risk except for Lower Mule Creek which is functioning properly and Big Dry Creek, South Dugway Creek-San Francisco River, and Whitewater Creek watersheds which have impaired function. All three watersheds were impacted by the 2012 Whitewater-Baldy Fire.

The fire burned 14,365 acres (approximately 57 percent of the watershed) in the Big Dry Creek watershed and 1,910 acres (approximately 6 percent of the watershed) in the South Dugway Creek-San Francisco River watershed and 25,115 acres approximately 57 percent of the watershed) in the Big Dry Creek watershed. The South Dugway Creek-San Francisco River watershed is also impaired for irrigation withdrawals from the San Francisco River.

There are seven watersheds with lands associated with both the Apache Sitgreaves National Forests and Gila National Forest. Results from the analysis for these watersheds indicated Lower Pueblo Creek is functioning at risk and Citizen Canyon, Keller Canyon, Little Blue Creek, and Vigil Canyon watersheds are functioning properly. Mineral Creek and Wendy Flat-San Francisco River watersheds have impaired function. The Mineral Creek watershed is impaired due to 19,171 acres (approximately 58 percent of the watershed) that were impacted from the 2012 Whitewater Baldy Fire. The Wendy Flat-San Francisco River watershed is listed as impaired for irrigation withdrawals.

Outstanding National Resource Waters

All perennial rivers and streams located in wilderness areas in New Mexico are designated as outstanding national resource waters. In the New Mexico portion of the project area, these are Little Whitewater Creek on the Holt Gulch allotment; Big Dry, Spruce, Spider, and Little Dry Creeks on the Dry Creek allotment; and Sacaton Creek on the Sacaton allotment. Due to the steeper terrain in these drainages, cattle use in these areas is none to light, with adverse watershed impacts unlikely.

Review of the State of Arizona outstanding waters database from Arizona Department of Environmental Quality shows no outstanding waters within the Arizona portion of the project area allotments or project area watersheds.

Table 12 lists the indicators and measures used to compare alternatives for the Stateline Range Project to disclose hydrology related effects. They are understandable, quantifiable, and sensitive to change.

Table 12. Resource indicators and measures for the existing condition

Resource Element	Resource Indicator	Measure	Existing Condition
Water quality	Sediment delivery at proper functioning condition sites	Impacts from proposed action with design features implemented	Of the proper functioning condition data collected, all were in satisfactory condition for sediment delivery except for: Rattlesnake and Rustler Canyons on the Blackjack allotment, Apache-Sitgreaves National Forests (from grazing) Lower and Upper Coalson and Lower Bullard on the Copperas allotment (from 2013 flooding and grazing) Webster Spring on the Citizen allotment, Gila National Forest (from grazing) Lower Little Whitewater Creek on the Holt Gulch allotment (Gila National Forest) (from post fire flooding)
Water quality	303(d)-listed waterbodies	Impacts from proposed action with design features implemented	Approximately 25.1 miles of the Blue River, from Strayhorse Creek to San Francisco River for *E. coli* from pathogens Approximately 19.4 miles of the San Francisco River from Blue River to Limestone Gulch for *E. coli* from pathogens Approximately 11.2 miles of the Gila River, From Skully Creek To San Francisco River for selenium Approximately 8.9 miles of the San Francisco River from Dry Creek to Whitewater Creek for benthic macroinvertebrates bio-assessments (cause unknown)
Riparian areas	Potential disturbance to riparian areas	Potential disturbance to riparian areas from proposed action with design features implemented	Of the proper functioning condition data collected, all were in satisfactory condition for riparian except for: Dutch Blue Creek on the Alma Mesa allotment, Apache-Sitgreaves National Forests (from grazing) Rattlesnake and Rustler Canyons on the Blackjack allotment, Apache-Sitgreaves National Forests (from grazing) Lower and Upper Coalson and Lower Bullard on the Copperas allotment (from 2013 flooding and grazing) Webster Spring on the Citizen allotment, Gila National Forest (from grazing) Lower Little Whitewater Creek on the Holt Gulch allotment (Gila National Forest) (from post fire flooding)
Watershed function	Road density	Increase to road density by 6th-level watersheds	Coal Creek watershed open road density 0.8 miles of road per square mile. Dix Creek watershed road density is 0.9 miles/square mile.

Resource Element	Resource Indicator	Measure	Existing Condition
Soils	Soil stability	Range surveys	Proper soil stability is being maintained or improving where the potential exists across most of the project except for the Mesquite pasture in the Pleasant Valley allotment, some isolated locations along Rattlesnake Canyon in the Blackjack allotment, a few areas within the Hickey and Keller Canyon allotments, and the Webster Spring area on the Citizen allotment.
Soils	Soil quality	R3 soil condition assessments (USDA Forest Service, 2013; 1999)	Overall, soil quality or soil condition indicates that soils are being maintained in a state of or are improving towards functioning properly within their potential capability across the majority of the project allotments. Exceptions include isolated occurrences of bare soil exposure via accelerated erosion and compaction effects ultimately leading to soils with degraded function in some areas of the Pleasant Valley, Blackjack, Hickey, Keller Canyon, Dry Creek, Citizen, and Sacaton allotments.

Environmental Consequences

Direct and Indirect Effects of Alternative 1 – No Grazing

No direct or indirect effects would occur from permitted livestock.

Key elements addressed in this alternative include an increase in herbaceous ground cover, improvement in woody and herbaceous riparian vegetation, and reduction of soil compaction. Implementation of the no-action alternative provides for the quicker rate of upward trend, and would result in the best maintenance and improvement of watershed conditions. This alternative would help move impaired or unsatisfactory soil, riparian, and watershed conditions towards forest plan standards over the next decade, recognizing that recovery of riparian and watershed conditions to satisfactory conditions can be a slow process depending on climate and natural disturbance processes.

This alternative has the potential to adequately maintain satisfactory soils across the project and improve locations of impaired soils, most notably those isolated occurrences of bare soil exposure and compaction effects around locations of livestock concentration where the potential exists.

In the uplands, herbaceous ground cover and plant vigor would increase, and soil compaction would start to break up, allowing increased water infiltration and a reduction in surface runoff.

The no-action alternative would maintain or improve riparian condition on all riparian areas on the allotments. Riparian areas in proper functioning condition would remain in proper functioning condition, provided that natural disturbance such as fire or floods do not occur frequently. Riparian reaches impacted by past grazing would see improvements

Stream channel and floodplain integrity would be improved or maintained across the allotment. The intent of Executive Orders 11988 (Floodplains) and 11990 (Wetlands) would be met. Drought conditions in the Southwest may be a limiting factor for riparian recovery, including springs.

No roads would be added to the Apache Sitgreaves transportation system. Therefore, no maintenance of the unauthorized routes proposed to be added to the transportation system would occur. Localized effects to water quality in Coal Creek would continue where this road crosses the stream.

Direct and Indirect Effects of Alternative 2 – Proposed Action

The proposed action would incorporate management flexibility and best management practices by providing a range of allowable numbers that reflect variations in resource conditions and management objectives over time.

Soils Effects

The proposed action would meet forest plan standards and guidelines, but would not move areas of impaired or unsatisfactory soil, or watershed conditions towards forest plan standards as quickly as the no-action alternative.

Proper stocking levels, good distribution, maintenance of infrastructure, pasture rotations, and adaptive management during periods of drought would all play a key role in improving or maintaining watershed conditions. In addition, this alternative proposes to add improvements on most allotments which, if they are developed, could better distribute cattle and reduce the amount of time cattle spend in the riparian areas reducing effects such as compaction and bare soils.

With implementation of this alternative, upland watershed conditions would be expected to continue to be maintained or see slight improvements. Disturbances to microbiotic soil crusts from cattle would continue to occur under this alternative.

Overall, across the project area, soils in satisfactory condition would remain that way or improve, impaired soils should slightly improve, and inherently unstable soils would remain in that state.

Water Quantity Effects

The proposed action proposes to develop 3 new wells in Arizona and 2 new wells in New Mexico. Also, additional storage tanks and troughs would be added to existing water developments. Water systems that would include solar powered pumps would be designed for the pumps to automatically turn off when the troughs and storage tanks are full to avoid continuous pumping. For some of the additional troughs, the livestock would still drink from the same water source, just not have as far to travel to reach it. Currently, permitted livestock numbers consume an estimated 109 acre feet of water annually across the entire project area. With the proposed 3 percent decrease in total permitted numbers the amount of water needed would decrease slightly to an estimated 106 acre feet of water annually.

There would be less dependence on surface water, such as springs and streams, which would provide some benefit to springs in those areas. The Blackjack allotment would have the greatest shift from surface water to groundwater use. However, the majority of the water supply across the project area would still come from surface water with 4 allotments depending entirely on surface water. Considering the size of the project area (271,665 acres), the amount of water needed is considered to be insignificant and discountable with no measurable effects at the project level; that is, the San Francisco River.

Water Quality and Riparian Effects

The proposed action for each allotment would incorporate management flexibility to provide a range of allowable numbers that reflect variations in resource conditions and management objectives over time.

The proposed action continues to limit access to the San Francisco River, better distribute livestock in the uplands, and keep a conservative utilization rate. These and other grazing BMPs and adaptive management would help improve water quality, in relationship to e coli, in both the San Francisco River in the future.

Implementation of adaptive management and the described range improvements where riparian conditions are not satisfactory in Rattlesnake and Rustler Canyons on the Blackjack allotment, Dutch Blue Creek on the Alma Mesa allotment, Lower and Upper Coalson and Lower Bullard on the Copperas allotment, and Webster Spring on the Citizen allotment would move water quality and riparian resources toward satisfactory conditions. This would be done in conjunction with monitoring, adaptive management strategies and best management practices.

When proposed utilization standards are met or there are indications that livestock are concentrating in parts of the allotment or on special sensitive areas, action would be taken to reduce the potential impacts by moving the livestock to other pastures or removing them from the allotment.

Monitoring of forage availability, the proposed utilization levels, range readiness, and resource conditions would be used to determine if management is being properly implemented and whether the actions are effective at achieving or moving toward desired conditions.

Implementation of a monitoring and adaptive management strategy and best management practices where riparian conditions are not in satisfactory condition would move water quality and riparian resources toward satisfactory conditions. This alternative meets forest plan standards and guidelines, but would not move impaired riparian areas, or watershed conditions towards forest plan standards as quickly as the no grazing alternative.

With a few exceptions, management of the allotments is not dependent upon the proposed range improvements nor are they proposed to increase numbers of permitted livestock but are proposed for the more effective management of the resource. The exceptions include those listed above under the “Proposed Authorizations and Improvements” section. Also, as explained in this section, portions of the San Francisco River, Dix Creek, lower portion of Right Prong Dix Creek, and a 4-mile portion of Left Prong Dix Creek would be closed to livestock grazing.

Even without the proposed structural improvements, resource conditions would improve gradually, under the proposed action. Further, the road proposed to be added to the transportation system in Coal Creek would continue to have localized effects to the stream and water quality at the stream crossing, but not to the point where overall water quality in Coal Creek would be affected. Implementation of best management practice Road-4 would reduce effects.

Table 13. Summary of direct and indirect effects to riparian and soils resources for alternative 2

Allotment	Riparian Effects	Soil Effects
Alma Mesa	Little Dutch Blue Creek is functioning at risk due to limited recruitment of seedlings and saplings that would grow to replace the older age class. Livestock grazing in this area would occur primarily during the dormant season between Oct. 1 and Aril 30, allowing for full growing season rest. Utilization would be managed for a light intensity. Little Dutch Blue Creek is expected to improve and the other 7 riparian reaches are expected to remain in proper functioning condition.	Soils in satisfactory condition would remain that way or improve, impaired soils should slightly improve, and inherently unstable soils would remain in that state.
Blackjack	The proposed improvements and adaptive management would lessen pressure and dependence of water in Rattlesnake and Rustler Canyons where the riparian rated as functioning at risk with a recommendation to better disburse cattle in the uplands. Conditions should improve in these 2 reaches and remain properly functioning in the other 9 reaches.	Proposed improvements in the Rattlesnake pasture would benefit soils. Late-season use of Mesquite Flat pasture should provide mostly growing season rest every year which would improve the impaired soils with a slow upward trend. The other pastures should maintain their condition.
Copperas	Shorter use, coupled with longer rest periods with improved rotations, would improve the riparian in Coalson Canyon and Lower Bullard Canyon. Copperas and Upper Bullard Canyons are expected to remain functioning properly, while Coalson and lower Bullard are expected to improve to proper functioning condition.	As with each allotment, soils conditions are satisfactory overall but adaptive management with the aid of additional improvements could improve soil conditions in localized areas.
Hickey	Livestock would continue to be excluded from the San Francisco River as the San Francisco River would not be part of an allotment. Five water lot fences around springs would improve riparian conditions at those springs. As a result, riparian areas in this allotment are expected to remain functioning.	For soils, a slow upward trend is expected to continue. Improved dispersion would help improve upland soils.
Keller Canyon	No riparian resources occur on this allotment.	Stable to slightly upward trend is expected for soils in this allotment.
Lop Ear	Stable trend anticipated for each of the 4 reaches surveyed.	Stable to slightly upward trend is expected for soils in this allotment. If/when installed, the proposed water developments could further aid in dispersing soils effects in upland areas and improved soil conditions.
Alma	Livestock grazing would continue to be excluded from the San Francisco River through natural barriers or fencing. The riparian areas in this allotment are expected to remain functioning.	Soils upward trend is expected to continue with adaptive management and improved distribution, particularly in the Twin Sisters Corral area if or when the proposed water development is installed.

Allotment	Riparian Effects	Soil Effects
Citizen	Livestock grazing would continue to be excluded from the San Francisco River. The spring development at Webster Spring would continue to be fenced to exclude livestock access. Additional improvements are proposed to improve conditions at Webster Spring. Riparian conditions should improve to satisfactory conditions in this area and maintain proper functioning condition in the other reaches.	Webster Spring mitigation would occur and improve soils in that area. Soils exhibiting stable to upward trend are expected to continue except for isolated areas near upland water sources.
Dry Creek	Livestock grazing will continue to be excluded from the San Francisco River, and approximately 1.3 miles of the lower portion of Big Dry Creek. Stream reaches were determined to be properly functioning and it is expected to continue.	Localized areas in unsatisfactory condition are improving slowly and overall soil conditions are satisfactory. This slow upward trend is expected to continue with better livestock distribution.
Holt Gulch	The upward trends in Holt Gulch and Little Whitewater Creek are expected to continue. Lower Little Whitewater Creek is still recovering following the 2012 post-fire debris flows but the upward trend is expected to continue.	Soils upward trend is expected to continue across the allotment, including fire areas.
Pleasanton	Livestock would continue to be excluded from the San Francisco River. All 4 stream reaches were determined to be functioning properly with a stable to upward trend. These conditions are expected to continue.	Soils exhibiting stable to upward trend are expected to continue except for isolated areas near upland water sources. In addition, the proposed well, if installed, would assist with livestock distribution.
Potholes	Potholes Canyon was determined to be at proper functioning condition, with both old and young age classes and is stable with limited floodplain development, which is natural for this system. The condition and trend is expected to continue.	Soil conditions were found to be improving at all pastures with the upward trend expected to continue.
Sacaton	The upper 1.8 miles of Sacaton Creek above private land (Section 28), that is excluded from livestock grazing, was determined to be at proper functioning condition while recognizing channel effects from the 2012 Whitewater-Baldy Fire. However, the channel remains functioning and the stable to upward trend is expected to continue.	Soil conditions were found to be satisfactory in all pastures with inherently stable soils. Isolated areas near upland water sources in some areas show signs of compaction and soil exposure. Soils upward trend is expected to continue.

Table 14. Summary comparison of environmental effects to watershed-related resources

Resource Element	Indicator and Measure	Alternative 1	Alternative 2
Water quality	Indicator: Sediment delivery Measure: Impacts from proposed project activities after design features and best management practices implemented	Reduced from existing condition due to no grazing proposed	Localized, short-term effects to water quality, stream channel morphology, and riparian areas are anticipated. Riparian reaches expected to remain or improve to satisfactory conditions with implementation of adaptive management and best management practices. Water quality is expected to remain at or improve towards acceptable levels.
Water quality	Indicator: Chemical water quality. Measure: Impacts from proposed project activities after design features and best management practices implemented	Reduced from existing condition due to no grazing proposed	Localized, short-term effects to water quality, stream channel morphology, and riparian areas are anticipated. Implementation of adaptive management and best management practices should keep water quality stable or improve to acceptable levels but not to the point where the impaired waters would be removed from the 303(d) list.
Riparian areas	Indicator: Potential disturbance Measure: Potential disturbance to riparian areas from proposed project activities after design features and best management practices implemented	Reduced from existing condition due to no grazing proposed	Localized effects to stream channel morphology and riparian areas are anticipated. Implementation of adaptive management and best management practices expected to improve overall riparian conditions. Riparian reaches expected to remain satisfactory or move towards desired conditions.
Watershed Function	Indicator: Road density	Increase to road density by 6th-level watersheds	Coal Creek Watershed road density would increase from 0.8 miles per square mile to 1.0 miles per square mile. Dix Creek Watershed road density would remain unchanged (0.9 miles per square mile).
Soils	Indicator: Soil stability Measure: Range surveys	Under this alternative, soil stability is expected to be maintained at a satisfactory condition where it currently exists. Impaired soils should improve towards satisfactory conditions at a quicker rate. Unsatisfactory soils would likely see minimal improvement and inherently unstable soils would remain in that state.	Some localized, short-term impacts to soil stability are anticipated during the implementation of proposed rangeland infrastructure improvements where they are planned. Soil stability is expected to be maintained as satisfactory or improve towards satisfactory from an impaired state across the majority of allotments in the long-term where the potential exists.

Resource Element	Indicator and Measure	Alternative 1	Alternative 2
Soils	Indicator: Soil quality Measure: R3 soil condition assessment protocol and rating guide (USDA-FS, 2013; 1999)	Overall soil quality is expected to be maintained at a satisfactory condition where it currently exists with the implementation of the no grazing alternative. Locations of impaired soils would have an improved chance to trend towards satisfactory conditions at a quicker rate than alternative 2. Unsatisfactory soils would likely see very little improvement and inherently unstable soils would remain in that state under this alternative.	Some localized, short-term impacts to soil quality are anticipated during the implementation of proposed rangeland infrastructure improvements where they are planned. Overall soil quality is expected to be maintained as satisfactory or improve towards satisfactory across the majority of allotments in the long-term where the potential exists. Unsatisfactory soils would likely continue and inherently unstable soils would remain in that state under this alternative.

Cumulative Effects

Twenty-four 6th-level watersheds were rated for functionality by the Apache-Sitgreaves National Forests and 18 were rated for functionality by the Gila National Forest, using the watershed condition report protocol (USDA Forest Service 2011).

On the Apache-Sitgreaves National Forests, 8 watersheds were properly functioning (watershed condition class 1), 14 were functioning at risk (watershed condition class 2) and 2 were rated as impaired (watershed condition class 3). Negro Canyon-Gila River and Silver Basin Creek-San Francisco River were not rated due to the small National Forest System land base involved with these watersheds. On the Gila National Forest, 5 watersheds were properly functioning (watershed condition class 1), 8 were functioning at risk (watershed condition class 2) while 5 were rated as impaired (watershed condition class 3).

This cumulative effects analysis looks at whether the proposed action of the Stateline Range Project would impact the resource indicators involved in determining the current watershed function ratings, when added to other past, present or future projects. This includes impacts to riparian, water quality, and soil conditions from grazing.

Direct and indirect effects for all resource indicators for alternative 2 proposed for the Stateline Project show minor effects to riparian, water quality, and soils conditions are anticipated. With implementation of best management practices, mitigation measures, monitoring, and adaptive management effects would be minimal and within State and Federal laws and forest plan guidance.

Past, ongoing, and reasonably foreseeable projects that could impact surface water resources would be past wildfires and vegetation management projects (including prescribed fire, road-related maintenance, livestock grazing, and mining). Resource protection measures and best management practices specific to those projects would protect water quality, aquatic habitat, riparian and wetland resources and road conditions.

It is expected current watershed condition classes for project area watersheds on each national forest would remain stable or improve (particularly within the Whitewater-Baldy fire footprint) over the planning cycle.

Wildlife

Affected Environment

A variety of wildlife species occur within the project area including several which are listed as endangered, threatened, or sensitive, as well and management indicator species and species of concern. Consultation with U.S. Fish and Wildlife Service is required where endangered, threatened, candidate species, or their critical habitat may be affected by a proposed Federal action. Five endangered species occur, or have habitat that occurs, in the project area (table 15).

Table 15. Endangered species and critical habitat within the project area

Species	Background
Mexican gray wolf	Listed as an experimental, non-essential population. Reintroduced into the Blue Range wolf recovery area within the Apache National Forest (Arizona) in January 1998. Translocated into the Gila Wilderness in March 2000. Reintroduction of experimental, non-essential populations is predicated on wolves adapting to the current land uses, including livestock grazing.
Southwestern willow flycatcher	Habitat and or species are reasonably certain to occur on, or adjacent to, each allotment except for Holt Gulch, Lop Ear, Potholes, and Sacaton.
Gila chub	Occurs in Dix Creek on the Pleasant Valley allotment and in Mule Creek adjacent to the Potholes allotment. Individuals from the population in Harden Cienega Creek, outside of the project area, may occasionally enter the San Francisco River upstream of the Pleasant Valley allotment.
Loach minnow	Likely present in portions of the San Francisco River adjacent to multiple allotments. Suitable habitat occurs and is reasonably certain to be occupied in the San Francisco River adjacent to the Copperas, Hickey, Keller Canyon, Pleasant Valley, Alma, Citizen, Dry Creek, Pleasanton, and Potholes allotments.
Spikedace	It is believed that spikedace were extirpated from the San Francisco River in the 1950s. They were reintroduced in New Mexico in 2008 to 2010 upstream of the project area allotments. In Arizona, this species is not known to currently occur within the project area. In New Mexico, they are present on the Alma allotment and adjacent to the Citizen, Dry Creek Keller Canyon, Pleasanton, and Potholes allotments.

The project area provides habitat for many game species such as bighorn sheep, elk, mule deer, Coues whitetail deer, pronghorn antelope, bear, mountain lion, javelina, and turkey. Hunting of these species is a popular activity that occurs throughout the project area. Since potential effects of the proposed action on these species was not identified as an issue or concern (except mule deer, which is addressed as a management indicator species below), this section will focus on effects to listed species.

Analysis of sensitive species which occur or their habitat is present, and there is a potential for them to occur within the project area include 5 birds, 5 snails, 3 fish, 1 frog, 9 plants, and 3 insects.

Management indicator species apply to the Gila National Forest. The Apache-Sitgreaves National Forests personnel manage focal species which are analyzed at the forest level and not at the project level such as this. There are 10 management indicator species within the project area on the Gila National Forest: 1 fish, 3 mammals, and 6 birds. The northern goshawk and common black hawk are also sensitive species, and the Mexican spotted owl is designated as a threatened species; the three species are analyzed in those sections.

Habitat exists for 24 bird species listed as species of concern which require analysis of possible effects under the Migratory Bird Treaty Act per Executive Order 13186.

Six threatened species occur, or have habitat that occurs, in the project area (table 16).

Table 16. Threatened species and critical habitat within the project area

Species	Background
Mexican spotted owl	Apache-Sitgreaves National Forests: Critical habitat and one protected activity center occurs on the Alma Mesa Allotment. On the Copperas allotment, only critical habitat is present. For the other allotments, neither the owl nor its habitat is present. Gila National Forest: One protected activity center occurs on the Dry Creek Allotment. On the Sacaton and Holt Gulch allotments, only critical habitat is present; however, there is a protected activity center within 2 miles of the Holt Gulch allotment and 0.3 miles of the Sacaton allotment. The protected activity centers on the Dry Creek allotment and adjacent to the Holt Gulch and Sacaton allotments are located in steep, remote areas in the Gila Wilderness that are mostly inaccessible to livestock.
Western yellow-billed cuckoo	The western yellow-billed cuckoo usually occurs in association with large blocks of mature riparian cottonwood-willow woodlands and dense mesquite associations within the San Francisco River and Dix Creek.
Chiricahua leopard frog	Listed as threatened in 2002. The Chiricahua leopard frog is known to occur on the Blackjack, Hickey, and Pleasant Valley allotments in Arizona. There is approximately 12.5 miles of historical habitat along the San Francisco River. They are not known to occur, nor is there designated critical habitat, within the New Mexico portion of the project area. They utilize both natural and artificial habitats, including livestock-related structures (for example, earthen stock tanks, and troughs).
Northern Mexican gartersnake	The northern Mexican gartnersnake and its proposed critical habitat is only present adjacent to the Potholes allotment within the project area. They are generally found near water.
Narrow-headed gartersnake	The narrow-headed gartersnake occurs in the San Francisco River in Arizona. Proposed critical habitat is present in New Mexico within the boundaries of the Alma, Dry Creek, Holt Gulch, Keller Canyon, Pleasanton and Potholes allotments, but livestock grazing is excluded from within critical habitat. No habitat occurs on the Sacaton allotment. Occupancy is inferred until further surveys determine status.
Gila trout	Occurs in waters within the Dry Creek allotment. Gila trout occur in upper Big Dry Creek and were reintroduced in 2018 into Spruce Creek (a headwater tributary to Big Dry Creek) following post-fire ash and debris flow in 2012.

Environmental Consequences

Direct and Indirect Effects of Alternative 1 – No Grazing

With the removal of grazing from the landscape, a vegetation response is expected, with more forage available for wildlife. However, there are many other factors that contribute to the changes in a plant and grass community.

Improvements contributing to resource protection or enhancement, such as water developments important for wildlife, would be maintained where feasible using other Forest Service program funds, but many water developments may not be maintained. Wildlife, particularly frogs, that have benefitted from these developments, in an environment where water is scarce, could be forced to move to other areas. This could negatively impact the populations that have relied on these water sources.

Specific to aquatic biological resources, the no-action alternative would likely maintain or improve riparian conditions on all riparian areas. Riparian areas in proper functioning condition would likely remain in proper functioning condition, assuming the absence of natural events such as flooding and wild fire. Riparian reaches currently impacted by grazing would likely see improvements with the absence of future grazing. Within portions of the functioning at risk reaches there would be less utilization of riparian species with an increase in both species composition and vigor. The spatial and temporal extent of natural surface waters would likely increase in some areas (for example, developed springs) since water withdrawals specific to livestock grazing would not occur. In addition, soil compaction from historic and current livestock grazing would likely decrease over time.

Stream channel and floodplain integrity would likely be improved or maintained. Stream reaches currently listed as impaired (for example, sediment, bacteria) are not likely to be negatively impacted by the no action alternative, as potential negative effects from livestock grazing would be absent.

Chiricahua leopard frogs coexist with grazing activities at most sites where it is found (USFWS 2007). Stock tanks constructed as water sources for livestock are important habitat for this species and there is a high probability that the Chiricahua leopard frog would be extirpated from some areas without maintained stock tanks. Otherwise there would be **no effect determination** to listed species under this alternative.

Sensitive Species: Since there would be no grazing or associated management activities within the allotments, changes in the quantity and quality of herbaceous species would increase. This increase may affect some prey species and the ability of raptor species to hunt.

There would be no direct effects on sensitive species as no activities would occur that would cause disturbance to these species, nor impacts to the existing habitat conditions. Water sources may be removed or not maintained on the allotments which may change the foraging areas of some species that have become habituated to these water sources, in particular bats or the Common black hawk. This alternative would not impact the sensitive species and is not likely to cause a trend to Federal listing or loss of viability. There would be no cumulative effects.

Management Indicator Species: The effect to management indicator species is at the forestwide population level. Under this alternative, mule deer numbers are expected to continue to decrease slightly but it is unlikely to result in a loss of population viability. It is expected there would be reduced maintenance of the existing improvements and result in a lack of water sources. This would reduce the amount of available habitat. Predator numbers may also increase slightly.

There would be reduced maintenance of the existing improvements but this would not likely impact the Mearns' quail to result in a loss of population viability. The amount of habitat would not change, but the quality and quantity of forage left for quail would likely increase with a likely increase in grass cover height. This would also increase hiding cover from predators, thus increasing chick and adult survival.

The effects of this alternative on Gila trout, common black hawk, and northern goshawk are also unlikely to result in a loss of population viability.

Direct and Indirect Effects of Alternative 2 – Proposed Action

Informal consultation with the U.S. Fish and Wildlife Service, New Mexico Ecological Services office, was initiated on April 16, 2019 for the Alma, Citizen, Dry Creek, Holt Gulch, Keller Canyon, Pleasanton, Potholes, and Sacaton allotments with a concurrence letter received on May 23, 2019.

Informal consultation with the U.S. Fish and Wildlife Service, Arizona Ecological Services office, was initiated on April 29, 2019 for the Alma Mesa, Copperas, and Lop Ear allotments with a concurrence letter received on May 7, 2019.

Formal consultation was initiated on April 29, 2019 with the U.S. Fish and Wildlife Service, Arizona Ecological Services Office for the Blackjack and Hickey allotments. Comments were received from U.S. Fish and Wildlife Service personnel on May 16, 2019 and on June 3, 2019. The final biological assessment was sent to U.S. Fish and Wildlife Service personnel on June 27, 2019, and consultation is ongoing until a biological opinion is received.

One commenter to the Preliminary EA raised an issue of possible impacts by noise from generators to wildlife and where threatened and endangered species or their habitat is present. There are five existing gas/diesel generators within the project area including on the Alma Mesa allotment at Stateline Cabin and Charlie Moore Cabin facilities, on the Citizen allotment at Smoothing Iron facilities, on the Dry Creek allotment in Sheridan Canyon and on the Potholes allotment near Mineral Spring Canyon. None are located within critical habitat for threatened and endangered species and were not identified as an issue.

Endangered Species

Mexican Gray Wolf (*Canis lupus baileyi*)

Endangered Species Act Status: Endangered January 16, 2015; Experimental, non-essential January 12, 1998; revised regulations January 16, 2015

Pursuant to the Endangered Species Act Section 10(j) rule, the Mexican gray wolf population is an experimental, nonessential population. The section 10 (j) rule lists activities, including livestock grazing, specifically excluded from adversely affecting the Mexican gray wolf.

The Mexican gray wolf population is managed by the Interagency Field Team. In the event wolves establish a territory within an allotment or depredation by wolves becomes an issue, various methods to reduce depredation should be considered as recommended by the Interagency Field Team. This may include but is not limited to:

- removal of attractants such as the carcass or visceral remains of livestock and wildlife
- moving livestock from a pasture that is adjacent to or near a denning site during the denning season to an alternative pasture
- employ range riders to patrol livestock herds and prevent depredations that could occur
- hazing wolves by non-lethal methods and/or making loud noises in proximity to wolves
- lethal removal

Reintroduction of experimental non-essential populations of wolves in the recovery area is predicated on wolves adapting to the current land uses, including livestock grazing. By definition, an experimental, non-essential population is not essential to the continued existence of the species. Therefore, the preliminary determination is **not likely to jeopardize** for the Mexican gray wolf.

Critical Habitat: Because the Mexican gray wolf is an experimental, non-essential population, there is no designated or proposed critical habitat for the species.

Southwestern Willow Flycatcher *(Empidonax traillii extimus)*

Endangered Species Act Status: Endangered March 29, 1995; Critical habitat January 3, 2013

Both National Forests: Southwestern willow flycatchers occur intermittently along reaches of the San Francisco River in Arizona and New Mexico. There is potential for southwestern willow flycatchers to occur in Dutch Blue Creek, and the Little Blue River on the Alma Mesa allotment, Indian Creek, Coalson Canyon, and Citizen Canyon on the Copperas allotment, Hickey Canyon, Hackberry Gulch, and an unnamed canyon on the Hickey allotment.

Designated Critical Habitat: The San Francisco River has designated critical habitat for this species and is adjacent to 10 of the 14 allotments. The San Francisco River has been excluded from grazing and lies outside of the proposed allotment boundary changes.

For this species and the other species that rely on the San Francisco River, although the river corridor is outside of allotment boundaries and livestock grazing is not permitted on it, as unauthorized livestock use has occurred in the past and is expected to occur from time to time, it's important for fences to be maintained prior to authorizing use adjacent to the river, for periodic inspections to occur and for any excess or unauthorized use to be addressed in accordance with Forest Service procedures.

Grazing activities in the action area do not measurably or detectably reduce the suitability or regeneration of southwestern willow flycatcher habitat. Potential indirect effects occurring within the action area resulting from livestock grazing on the allotment are determined to be insignificant or discountable. The proposed action is consistent with the southwestern willow flycatcher recovery plan's general guidelines for domestic livestock grazing in southwestern willow flycatcher habitat. Livestock are excluded and would continue to be excluded from the San Francisco River. Where livestock grazing would occur, a "conservative" use level of 31 to 40 percent is proposed except for riparian areas not in properly functioning condition where the use level of 0 to 30 percent is proposed and is in alignment with the flycatcher recovery plan.

Determinations: For the species, the determination is **may affect, not likely to adversely affect** for the Alma, Alma Mesa, Blackjack, Citizen, Copperas, Dry Creek, Hickey, and Pleasanton allotments and no effect for the Holt Gulch, Keller Canyon, Lop Ear, Potholes, and Sacaton allotments. For the critical habitat, the determination is **may affect, not likely to adversely affect** for the Alma, Blackjack, Citizen, Copperas, Dry Creek, Hickey, and Pleasanton allotments and **no effect** for the Alma Mesa, Holt Gulch, Keller Canyon Lop Ear, Potholes and Sacaton allotments.

Gila Chub (*Gila intermedia*)

Endangered Species Act Status: Endangered with designated critical habitat November 2, 2005

Apache-Sitgreaves National Forests: Distribution is limited to the lower half-mile section of Right Prong Dix Creek and the lower 0.85 miles of Left Prong Dix Creek and Dix Creek. The project proposes additional fencing to change the allotment boundary so that Dix Creek and the lower portion of Left Prong Dix Creek and Right Prong Dix Creek that has perennial water would no longer be part of the allotment and would be closed to livestock grazing which would increase protection of this species and decrease the likelihood of negative impacts. Livestock grazing would occur upstream of occupied habitat, resulting in the chance for small-magnitude effects such as increased turbidity or sedimentation.

Gila National Forest: Known distribution is limited to Mule Creek which is next to the Potholes allotment boundary. Livestock grazing is excluded from the portion of Mule Creek that occurs on Forest System lands. Livestock grazing occurs upstream on the private lands portion.

Designated Critical Habitat on the Apache-Sitgreaves National Forests: Designated critical habitat is limited to approximately 0.6 miles in Dix Creek, 2.9 miles in Right Prong Dix Creek to Red Tank Well in T3S, R31E, Section 20, and 1.25 miles of the lower reach of Left Prong Dix Creek. This accounts for approximately 338 acres (300-foot stream buffer) of designated critical habitat existing within the current Pleasant Valley allotment, which is proposed to be divided between the Hickey and Blackjack allotments. Approximately 171 acres would be removed from grazing, leaving about 147 acres remaining within the Blackjack allotment and 20 acres in the Red Tank Trap that would be shared between Blackjack and Hickey allotments.

Much of the natural aquatic habitat in the project area is excluded from grazing by fencing or topography, and would be minimally impacted by grazing activities. The proposed additional fencing in the Dix Creek drainage would increase protection of, and decrease the likelihood of direct negative impacts to, critical habitat.

Designated critical habitat in Right Prong Dix Creek, upstream of the proposed allotment boundary fence to Red Tank Well, would be accessible by livestock. However, this section of Right Prong is typically dry and does not have the habitat features (primary constituent elements) essential for conservation of the species. The proposed pipeline extension north of Red Tank Well and the proposed water lot, if developed, would control livestock access to water and the timing and duration of use in the Mesquite pasture, including the area along the dry reach of Right Prong Dix Creek.

Minor habitat effects, such as increased turbidity, could originate upstream of the fenced and closed areas and produce low-magnitude downstream effects in the occupied habitat.

Gila National Forest: Critical habitat has not been designated in the project area in New Mexico. However, there is suitable, occupied habitat in Mule Creek adjacent to the Potholes allotment. The National Forest System portion of Mule Creek is excluded from livestock grazing. Impacts from grazing activities would be minimal and limited to downstream effects from grazing activities in the headwaters and upper portions of the watersheds.

Determinations: For the species, the determination is **may affect, not likely to adversely affect** for the Copperas, Hickey and allotments, may affect, likely to adversely affect for the Blackjack allotment and no effect for the Alma, Alma Mesa, Citizen, Dry Creek, Holt Gulch, Keller Canyon, Lop Ear, Pleasanton, Potholes and Sacaton allotments. For the designated critical habitat, the determination is may affect, likely to adversely affect for the Blackjack allotment, **may affect, not likely to adversely affect** for the Hickey allotment and **no effect** for the Alma, Alma Mesa, Citizen, Copperas, Dry Creek, Holt Gulch, Keller Canyon, Lop Ear, Pleasanton, Potholes and Sacaton allotments.

Loach Minnow (*Tiaroga cobitis*)

Endangered Species Act Status: Endangered with designated critical habitat February 23, 2012

The loach minnow occurs just outside the project area in the Blue River, and it is reasonably certain they occur in the San Francisco River adjacent to 8 allotments. Direct effects would be avoided by yearlong exclusion of livestock from occupied habitats in the action area. Indirect effects from upland livestock grazing, are determined to be insignificant or discountable as measured through quantitative or qualitative measures such as watershed health and condition, use levels, or sedimentation in critical habitat.

Designated Critical Habitat: For this alternative, designated critical habitat is in the San Francisco River adjacent to the following allotments:

- Copperas (Apache-Sitgreaves)
- Hickey (Apache-Sitgreaves)
- Blackjack (Apache-Sitgreaves)
- Pleasanton (Gila)
- Potholes (Gila)
- Dry Creek (Gila)
- Keller Canyon
- Citizen (Gila)
- Alma (Gila)

The San Francisco River is excluded from grazing and would be minimally impacted by grazing activities. The project proposes additional fencing, which would increase protection for some potentially suitable habitat.

Project-wide water use is expected to decline slightly (about 3 percent) as compared to existing management; therefore, detectable flow changes are not expected.

Small-magnitude indirect effects, such as sedimentation and bacterial input, could occur in a small percentage of stream reaches.

Determinations: The determination is **may affect, not likely to adversely affect** for the loach minnow species on the Alma, Alma Mesa, Blackjack, Citizen, Copperas, Dry Creek, Hickey, Keller Canyon, Pleasanton, and Potholes allotments and **no effect** on the Holt Gulch, Lop Ear and Sacaton allotments. The determination is **may affect, not likely to adversely affect** for loach minnow designated critical habitat on the Alma, Alma Mesa, Blackjack, Citizen, Copperas, Dry Creek, Hickey, Keller Canyon, Pleasanton, and Potholes allotments and **no effect** on the Holt Gulch, Lop Ear and Sacaton allotments.

Spikedace (*Meda fulgida*)

Endangered Species Act Status: Endangered with designated critical habitat February 23, 2012

Spikedace occur just outside of the project area in the Blue River and in the San Francisco River. The species was reintroduced 8 miles upstream of the project area in 2008, 2009, and 2010 and is reasonably certain to occur adjacent to the allotments bordering the San Francisco River. Direct effects would be avoided by yearlong exclusion and indirect effects are insignificant and discountable similar to loach minnow above.

Designated Critical Habitat: Within the project area, designated critical habitat is limited to the San Francisco River adjacent to the same allotments as loach minnow. Indirect effects to listed fish occurring within the action area which result from upland livestock grazing are determined to be insignificant or discountable as measured through quantitative or qualitative measures such as watershed health and condition, use levels, or sedimentation in critical habitat.

Determinations: For the species, the determination is **may affect, not likely to adversely affect** for the Alma, Alma Mesa, Blackjack, Citizen, Copperas, Dry Creek, Hickey, Keller Canyon, Pleasanton, and Potholes allotments and **no effect** on the Holt Gulch, Lop Ear and Sacaton allotments. For the designated critical habitat, the determination is **may affect, not likely to adversely affect** for the Alma, Alma Mesa, Blackjack, Citizen, Copperas, Dry Creek, Hickey, Keller Canyon, Pleasanton, and Potholes allotments and **no effect** for Holt Gulch, Lop Ear and Sacaton allotments.

Threatened Species

Mexican Spotted Owl (*Strix occidentalis lucida*)

Endangered Species Act Status: Threatened with designated critical habitat March 16, 1993

Apache-Sitgreaves National Forests: Mexican spotted owl surveys indicate the single protected activity center in the Alma Mesa allotment is currently active with the presence of livestock grazing activities. It is expected this protected activity center will remain active in the future.

Currently the protected activity center is in both the Alma Mesa pasture and the Bear Valley pasture. The proposed fence would put the protected activity center entirely in the Bear Valley Pasture. Season of use within the Bear Valley Pasture is proposed to be October 1 to April 30. With the construction of the proposed 0.8 mile fence in the northwest portion of the Alma Mesa pasture, livestock grazing within the protected activity center would decrease, occurring during the early part of the breeding season. During most of the breeding season the area around the protected activity center would be rested. Because a portion of this fence would occur within the protected activity center boundary, transport of material and construction would occur outside of the breeding season (unless surveys indicate non-breeding or infer absence).

Gila National Forest: Given the remote locations of Mexican spotted owl protected activity centers on the Dry Creek allotment and adjacent to the Holt Gulch and Sacaton allotments, livestock grazing, if any, is expected to be minimal. No new improvements are proposed within or near these protected activity centers.

For both national forests, proposed utilization intensities are consistent with guidelines in the Mexican spotted owl recovery plan (U.S. Fish and Wildlife Service 2012).

Designated Critical Habitat on both National Forests: Critical habitat occurs on the Alma Mesa, Copperas, Dry Creek, Holt Gulch and Sacaton allotments. Livestock grazing and livestock management activities would be managed at levels which maintain or enhance prey availability, maintain potential for beneficial surface fires and promote upland plant communities.

Within protected and restricted habitat, forage utilization would be maintained at conservative levels, light to moderate grazing intensity within owl habitats, as described in the 1995 recovery plan, or within protected and recovery habitat as described within the species' 2012 recovery plan, first revision.

Determinations: The determination for the Mexican spotted owl species is **may affect, not likely to adversely affect** on the Alma Mesa, Blackjack, Copperas, Dry Creek, Hickey, and Sacaton allotments and **no effect** for the Alma, Citizen, Holt Gulch, Keller Canyon, Lop Ear, Pleasanton, and Potholes allotments. The determination for Mexican spotted owl designated critical habitat is **may affect, not likely to adversely affect** on the Alma Mesa, Copperas, Dry Creek, Holt Gulch and Sacaton allotments and **no effect** for the Alma, Blackjack, Citizen, Hickey, Keller Canyon, Lop Ear, Pleasanton, and Potholes allotments.

Western Yellow-billed Cuckoo (*Coccyyzus americanus*)

Endangered Species Act Status: Threatened with proposed critical habitat October 3, 2014

On the Apache-Sitgreaves National Forests, western yellow-billed cuckoos are expected to occur within critical habitat which is not designated but is proposed along portions of the San Francisco River adjacent to the Hickey and proposed Blackjack allotment boundaries.

They may also occur along Dix Creek, adjacent to the proposed Blackjack allotment boundary, Dutch Blue Creek, and the Little Blue River, on the Alma Mesa Allotment, Indian Creek, Coalson Canyon, and Citizen Creek on the Copperas allotment, Hickey Canyon, Hackberry Gulch and an unnamed canyon on the Hickey allotment, and in Blackjack Canyon on the Lop Ear and Blackjack allotments, on the Apache-Sitgreaves.

On the Gila National Forest, western yellow-billed cuckoos may occur within proposed critical habitat along portions of the San Francisco River adjacent to the Alma, Citizen, Dry Creek, Pleasanton, and Potholes allotments

The San Francisco River is excluded from livestock grazing and Dix Creek is proposed to be excluded from grazing. Potential indirect effects occurring within the action area resulting from livestock grazing on the adjacent allotments are determined to be insignificant or discountable.

Proposed Critical Habitat: Currently there is no designated critical habitat for the Western yellow-billed cuckoo but it is proposed. Proposed critical habitat for the cuckoo is similar to that of the Southwestern willow flycatcher. Therefore, the effects described in the southwestern willow flycatcher section would be similar. However, some western yellow-billed cuckoos have been observed in Madrean oak, pine-oak, and juniper woodlands.

The San Francisco River is excluded from livestock grazing and Dix Creek is proposed to be excluded from grazing. Grazing activities in the action area do not measurably or detectably reduce the suitability or regeneration of western yellow-billed cuckoo habitat.

Determinations: The species determination for the western yellow-billed cuckoo is **may affect, not likely to adversely affect** for the Alma, Alma Mesa, Blackjack, Citizen, Copperas, Dry Creek, Hickey, Lop Ear and Pleasanton allotments and **no effect** for the Holt Gulch, Keller Canyon, Potholes and Sacaton allotments. The proposed critical habitat determination for the western yellow-billed cuckoo is **may affect, not likely to adversely modify or destroy** for the Alma, Blackjack, Citizen, Dry Creek, Hickey, and Pleasanton allotments and **no effect** for the Alma Mesa, Copperas, Holt Gulch, Lop Ear, Potholes Keller Canyon and Sacaton allotments. If proposed critical habitat is published, the determination would be "**may affect not likely to adversely affect**".

Chiricahua Leopard Frog (*Lithobates chiricahuensis*)

Endangered Species Act Status: Threatened June 13, 2002; Designated critical habitat March 20, 2012.

Apache-Sitgreaves National Forests: Chiricahua leopard frog have been observed or are reasonably certain to occur in the San Francisco River, Coal Creek, Dix Creek, and Rattlesnake Gap area of the Blackjack, Pleasant Valley, and Hickey allotments. Potentially suitable habitat may be present on the Copperas allotment, which is located a few miles upstream of known occupied and designated critical habitat.

On the Hickey allotment, the 2015 biological assessment proposed fencing portions of 3 stock tanks as possible conservation measures. Following the 2016 biological opinion, a portion of Rattlesnake Gap Tank was fenced with a solid pipe fence to better ensure water, emergent vegetation, and a place free from livestock disturbance for the frogs.

Chiricahua leopard frogs often occur in areas grazed by livestock with some studies showing no significant differences between grazed and ungrazed sites. However, adverse effects from livestock grazing activities can negatively impact this species, including possible trampling of egg masses, tadpoles and frogs; effects to habitat; possible introduction of nonnative species; spread of disease or chytrid fungus; and from cleaning stock tanks.

Direct effects could occur from mechanical equipment used to install wells and pipelines; modify fences, install new fencing, or both; and maintain or improve existing structures (for example, cleaning stock tanks) within potentially suitable habitat. Prior to cleaning stock tanks, a qualified biologist must survey for frogs. No new improvements are proposed within designated critical or currently known occupied habitat except for possibly fencing a portion of Rattlesnake Tank #1. The majority of this work would occur outside of riparian areas, limiting the potential for effects within natural waters. Sediment in stock tanks may be periodically cleaned out every few years or longer. This occurs when tanks are low or dry, but could affect frogs during periods of hibernation or estivation, when they may be buried in the mud.

Gila National Forest: Chiricahua leopard frogs are believed to be extirpated from the planning area in New Mexico.

Designated Critical Habitat on the Apache-Sitgreaves National Forests: Critical habitat occurs around three stock tanks on the Hickey allotment, along Coal Creek on the Blackjack allotment, and in Dix Creek and lower Right Prong Dix Creek adjacent to the proposed Blackjack allotment boundary.

Designated Critical Habitat on the Gila National Forest: There is no designated critical habitat on the Gila National Forest within the project area.

Throughout their range, Chiricahua leopard frogs are often found living in earthen stock tanks commonly used by livestock. A significantly higher proportion of populations of Chiricahua leopard frogs were found in cattle tanks compared to riverine habitats in Arizona from 1993 to 1996 (Sredl and Saylor 1998), which shows the importance of these artificial waters.

Potential changes in water flow due to alteration of existing structures, and the addition of new wells, should have minimal impacts to occupied natural waters since measurable changes to this habitat type are not expected. An increase in artificial waters (for example, pipeline to Mesquite Tank, troughs) could potentially benefit this species in the long term, since they commonly utilize this habitat type.

The San Francisco River, Dix Creek, and sections of Left Prong Dix Creek and Right Prong Dix Creek would be excluded from livestock grazing. The proposed season of use for grazing along Coal Creek is during the dormant season, sometime between November 1 and March 1.

Some effects that originate in tributary streams and springs or uplands could potentially produce some effects in suitable habitat located downstream and downslope.

Management is expected to be consistent with recovery plan goals for this species.

Determinations: The species determination for the Chiricahua leopard frog is **may affect, not likely to adversely affect** for the Copperas and Alma Mesa allotments, and **may affect, likely to adversely affect** for the Blackjack and Hickey allotments, and **no effect** for the Alma, Citizen, Dry Creek, Holt Gulch, Keller Canyon, Lop Ear, Pleasanton, Potholes and Sacaton allotments. The critical habitat determination for the Chiricahua leopard frog is **may affect, likely to adversely affect** for the Blackjack and Hickey allotments and **no effect** on the Alma, Alma Mesa, Citizen, Copperas, Dry Creek, Holt Gulch, Keller Canyon, Lop Ear, Pleasanton, Potholes and Sacaton allotments.

Northern Mexican Gartersnake (*Thamnophis eques megalops*)

Endangered Species Act Status: Threatened July 08, 2014; Critical habitat proposed July 10, 2013

Apache-Sitgreaves National Forests: Not known to occur within the Arizona portion of the project area.

Gila National Forest: The northern Mexican gartnersnake and its habitat is only present adjacent to the Potholes allotment and not on the other allotments within the project area. They are generally found near water.

Currently proposed critical habitat for the northern Mexican gartersnake includes a 600-foot buffer on either side of the stream.

There would be little to no livestock use or livestock management activities where the species is reasonably certain to occur or where there is considered occupied habitat along Mule Creek.

Indirect effects which may result from upland livestock grazing are determined to be insignificant or discountable. That is, there is no measurable adverse effect to the species or its habitat or effects are extremely unlikely to occur. Proposed livestock management activities, within the action area, will not increase the likelihood that bullfrogs, nonnative fish, or crayfish will colonize, be introduced, or improve their status as a result of activities occurring in such aquatic sites.

Managed grazing with conservative use (31 to 40 percent) levels in the allotment adjacent to the northern Mexican gartersnake habitat would not result in measurable or detrimental effects to the species.

Determinations: The species determination is **may affect, not likely to adversely affect** for the Northern Mexican gartersnake on the Potholes allotment and **no effect** for the Alma, Alma Mesa, Blackjack, Citizen, Copperas, Dry Creek, Hickey, Holt Gulch, Keller Canyon, Lop Ear, Pleasanton and Sacaton allotments. The proposed action is **not likely to adversely modify or destroy** proposed critical habitat for the Northern Mexican gartersnake for the Potholes allotment and **no effect** for the Alma, Alma Mesa, Blackjack, Copperas, Citizen, Dry Creek, Hickey, Holt Gulch, Keller Canyon, Pleasanton, Lop Ear, and Sacaton allotments.

Narrow-Headed Gartersnake (*Thamnophis rufipunctatus*)

Endangered Species Act Status: Threatened July 08, 2014; Critical habitat proposed July 10, 2013

Apache-Sitgreaves National Forests: Proposed critical habitat is along the San Francisco River adjacent to the Copperas, Hickey, Keller Canyon, and proposed Blackjack allotment boundaries.

Gila National Forest: Proposed critical habitat is along the San Francisco River adjacent to the Alma, Dry Creek, Holt Gulch, Pleasanton, and Potholes allotments.

The proposed critical habitat for narrow-headed gartersnake is similar to the loach minnow and spikedace designated critical habitat. The narrow-headed garter snake's proposed critical habitat primary constituent elements includes a 600-foot buffer on either side of the stream.

Direct effects to narrow-headed gartersnakes are unlikely within both potentially occupied and proposed critical habitat (for example, San Francisco River), since the majority of habitat is excluded from livestock grazing by fencing or terrain. In a minority of potentially occupied habitat, such as livestock access to other perennial waters (for example, tributary streams), direct effects to snakes could occur from livestock use, including within or near artificial waters.

Some effects that originate in tributary streams and springs or uplands could potentially produce some effects in suitable habitat located downstream and downslope. However, indirect effects to narrow-headed gartersnake critical habitat within the action area are determined to not be measurable or are unlikely to occur. For example, any potential movement of sediments resulting from livestock grazing upstream of occupied sites are immeasurable relative to baseline levels or natural flows and perennial segments are not altered from typical levels (does not include results of drought, wildfire, or climate change).

Range improvements (for example, fencing) within or upstream of narrow-headed garter snake critical habitat minimize effects to the extent that they are insignificant and discountable or do not result in adverse effects during construction.

Determinations: The species determination is **may affect, not likely to adversely affect** for the narrow-headed gartersnake on the Alma, Alma Mesa, Blackjack, Copperas, Dry Creek and Hickey, Holt Gulch, Keller Canyon, Pleasanton and Potholes allotments and **no effect** on the Citizen, Lop Ear and Sacaton allotments. The proposed action is **not likely to adversely modify or destroy** proposed critical habitat for the narrow-headed gartersnake on the Alma, Alma Mesa, Blackjack, Copperas, Dry Creek, Hickey, Holt Gulch, Keller Canyon, Pleasanton, and Potholes allotments and **no effect** on the Citizen, Lop Ear, and Sacaton allotments.

Gila Trout (*Oncorhynchus gilae*)

Endangered Species Act Status: Threatened July 18, 2006

Gila trout does not occur on the Apache-Sitgreaves National Forests.

Gila National Forest: Gila trout occur in the Big Dry drainage on the Dry Creek allotment where livestock grazing in occupied habitats is limited due to the extreme ruggedness of the terrain and topography of the streams and is not considered a principal factor in the decline of the species or in restricting its recovery.

Critical habitat has not been designated for this species.

Gila National Forest: Suitable, occupied habitat exists and it is reasonably certain for Gila Trout to occur only within the Big Dry drainage including Spruce Creek. Post fire ash and debris flows eliminated Gila trout from Spruce Creek, however they remained in upper Big Dry Creek. Gila trout were repatriated into Spruce Creek in May, 2018. General livestock effects within or near currently occupied habitat (Big Dry Creek and Spruce Creek) are believed to be minimal or absent due to difficult access for livestock. No measurable changes are expected under the proposed action.

Determinations: The species determination is **may affect, not likely to adversely affect** for the Dry Creek allotment and **no effect** for the Alma, Alma Mesa, Blackjack, Citizen, Copperas, Hickey, Holt Gulch, Keller Canyon, Lop Ear, Pleasanton and Potholes and Sacaton allotments.

Sensitive Species

For the effects to sensitive species disclosed below, species are grouped together when the effects are similar.

Northern goshawks (*Accipiter gentilis*) have been observed on the Dry Creek, Sacaton, Holt Gulch, and Alma Mesa allotments.

The proposed action does not include activities such as timber harvest that would change the seral stage of the limited ponderosa pine and Douglas fir habitats within the allotments and result in negative impacts to this species. Changes in the quantity and quality of herbaceous forage could occur as a result of grazing and may affect some prey species. Conservative use (31 to 40 percent) grazing utilization guidelines would retain sufficient vegetation for prey species habitat and diversity. This alternative may impact individual goshawks, but is not likely to cause a trend to Federal listing or loss of viability.

Common black hawks (*Buteogallus anthracinus*) have been observed on the Blackjack, Hickey, Citizen, Holt Gulch, Pleasant Valley, and Potholes allotments and is suspected to occur on the Dry Creek, Sacaton, and Pleasanton allotments. They are often found in or near riparian areas.

The proposed action would not affect forest structure. Changes in the quantity and quality of herbaceous forage could occur and may affect some prey species. Livestock grazing is excluded from the San Francisco River, the lower 1.3 miles of Big Dry Creek, and the upper 1.8 miles of Sacaton Creek. It is also proposed to exclude from grazing Dix Creek, the lower portion of Right Prong Dix Creek and a portion of Left Prong Dix Creek. Proposed dormant season use of Coal Creek coupled with conservative use (31 to 40 percent) grazing utilization guidelines would retain sufficient vegetation for prey species habitat and diversity. This alternative may impact individual black hawks but is not likely to cause a trend to Federal listing or loss of viability.

Bald eagles (*Haliaeetus leucocephalus)* summer and winter in Arizona. In New Mexico, they also winter but are mostly migratory with few nests or sightings in the summer. They are typically found near large bodies of water and rivers. Large ponderosa pine, cottonwoods, and Douglas fir provide potential nesting and roosting habitat. Maintenance and recruitment of large trees is important for the species. Bald eagles are suspected to occur on the Alma Mesa allotment and along the San Francisco River near other allotments.

The proposed action would not affect forest structure nor would it affect foraging behavior for this species. This alternative would not impact bald eagles and is not likely to cause a trend to Federal listing or loss of viability.

Gray vireo (*Vireo vicinior*) and gray catbird (*Dumetella carolinensis*) – Vireos mostly occupy non-riparian areas. Much of their habitat is very dense woodland. They have not been documented on the allotments but suitable habitat is present and they are suspected to occur on each allotment. Catbirds are suspected to occur on the Alma Mesa, Blackjack, Copperas, Hickey, Lop Ear, and Pleasant Valley allotments.

Effects to gray vireo and gray catbird are similar except gray catbirds prefer dense shrubs, vine tangles, and thickets of young trees. Natural avoidance of those habitat areas by grazing cattle should provide protection of nest and roost habitat for them.

Conservative use levels should provide sufficient cover for nests and young, as well as foraging habitat. Habitat immediately adjacent to improvements may have habitat that is of lower quality for nesting but still used as foraging.

It is determined that the project may impact vireo and catbird individuals or habitat but is not likely to contribute to a trend towards Federal listing or loss of viability to the population or species.

The terrestrial snail complex include the following 5 sensitive species:

- *Ashmunella tetrodon inermis*
- *Ashmunella tetrodon mutator*
- bearded mountainsnail (*Oreohelix barbata*)
- Dry Creek woodlandsnail (*Ashmunella tetrodon tetrodon*)
- Whitewater Creek woodlandsnail (*Ashmunella danielsi*)

Ashmunella tetrodon inermis, *Ashmunella tetrodon mutator*, and Dry Creek woodlandsnail are found in the Mogollon Mountains, New Mexico. Presumably they could exist, at present, on the relatively arid, steep ridges that separate canyons such as Dry Creek Canyon from Sheridan and Little Dry Creek Canyons to the west and east (Biota Information System of New Mexico 2014). They appear to be limited to creek bottoms in deep canyons around stones and under deciduous tree leaf litter and logs (Biota Information System of New Mexico 2014).

Bearded mountainsnail *(Oreohelix barbata)* is found in in riparian areas in the Chiricahua Mountains of Arizona and the Mogollon Mountains of New Mexico. Within the Mogollon Mountains, this species occurs from Little Dry Creek Canyon northwest to Whitewater Creek Canyon then northeast to Willow Creek Canyon (Biota Information System of New Mexico 2014).

Whitewater Creek woodlandsnail *(Ashmunella danielsi)* was collected only in Little Whitewater Creek Canyon on a wooded, north-facing slope in igneous rock in talus, moss covered in places, containing damp leaf litter in interstices among the stones (Biota Information System of New Mexico 2014).

Direct effects to these terrestrial snails may come from mechanical equipment when used to install proposed pipelines. Livestock grazing would have little effect on the snails. Rock talus and streamside habitat for these snail should not be impacted by this action. Based on the location of the new pipelines and wells, and the unknown locality of the snails, impacts may occur, but should not result in a trend toward listing or loss of viability. This alternative may impact individual snails but is not likely to cause a trend to Federal listing or loss of viability.

Maguire's beardtongue (*Penstemon linarioides* ssp. *maguirei*) has been collected from less than 10 locations in Arizona and New Mexico but not observed since 1994. It is believed to occur in and near the Gila River Valley in Arizona and New Mexico and suspected to occur on the Alma Mesa, and Copperas allotments. Habitat is described as limestone cliffs in pinyon-juniper woodland at 6,000 to 6,500 feet.

Maguire's beardtongue is not known to occur in the project area; however, habitat could be present in the pinyon-juniper woodlands. Because the habitat is described as limestone cliffs, livestock grazing and livestock management activities are expected to present very little risk.

This alternative is not likely to cause a trend to Federal listing or loss of viability. Although the risk is low, the proposed action may result in impacts to those undetected individuals but those impacts are expected to be insignificant and discountable.

Wislizeni gentian (*Gentianella wislizeni*) and Arizona alumroot (*Heuchera glomerulata)* – Wislizeni gentian is a small annual or biennial herb endemic to Arizona and Mexico. In Arizona,

it has been reported from the White Mountains, Apache County and the Chiricahua Mountains, Cochise County (NatureServe 2017). Habitat is described as high-elevation clearings or partially shaded slopes in pine-oak and mixed conifer forests at 6,500 to 9,600 feet (NatureServe 2017, AZNPS 2000). Threats have not been identified (NatureServe 2017), but it appears to benefit from some disturbance such as low-intensity fire.

Arizona alumroot is known from the mountains of southeastern Arizona and from Animas Peak in New Mexico (NatureServe 2017).

Wislizeni gentian and Arizona alumroot are not known to occur in the project area; however, habitat could be present in the Alma Mesa allotment for both species. If unknown individuals are present, livestock grazing and the associated livestock management activities could impact individuals. Any inadvertent impacts to unknown individuals would not cause this species to trend towards Federal listing.

This alternative is not likely to cause a trend to Federal listing or loss of viability. Although the risk is low, the proposed action may result in impacts to those undetected individuals but those impacts are expected to be insignificant and discountable.

Davidson's cliff carrot (*Pteryxia davidsonii*) is known from Socorro, Catron, and Grant Counties in New Mexico and Greenlee County in Arizona. It is rarely collected and has been rarely reported; it is believed there are fewer than 3,000 individuals (NatureServe 2017).

Habitat is described as moist rocky places and sheer, north-facing cliffs at 6,500 to 8,000 feet. The cliff habitat of this species is unlikely to be threatened by typical land uses. However, it has also been reported (in 1930) from a moist creek, thus any land use practice that results in drying out of wet areas within its range may be a threat (NatureServe 2017).

Although there are no known occurrences of Davidson's cliff carrot in the project area, there may be habitat for the species on sheer cliffs. Livestock grazing and the associated management activities are not expected to impact this species nor its sheer-cliff habitat.

This alternative would not impact individual cliff carrot and is not likely to cause a trend to Federal listing or loss of viability because it grows in areas that are inaccessible to livestock grazing and associated management activities.

Parish's alkali grass (*Puccinellia parishii*) is an annual and known from scattered occurrences in western New Mexico, northern Arizona, southwest Colorado, California, and west Texas (NatureServe 2017).

There are no known occurrences of Parish's alkali grass in the project area, but there may be habitat for the species in the Alma Mesa allotment. The proposed action poses a low risk for this species. This proposed action is not expected to alter the hydrology of alkaline springs or seeps, and the species is known to persist at springs that may inadvertently by impacted by livestock grazing and trampling.

There is the potential for the presence of undetected individuals, so this alternative may impact individual alkali grass but is not likely to cause a trend to Federal listing or loss of viability as those impacts are expected to be insignificant and discountable.

Bebb's willow (*Salix bebbiana*) is considered sensitive on the Apache-Sitgreaves and Coconino National Forests. It may occur on other national forests but is not designated as sensitive. Its range is extensive, occurring in both Eurasia and North America. In North America, it ranges from Canada south to Arizona and New Mexico. In Arizona, it is found at elevations from 8,000 to 11,000 feet and is strongly dependent on ample water.

Threats include lack of replacement by younger age classes, declines in water availability, pathogens, prolonged suppression of fire, and grazing by both wild and domesticated herbivores (NatureServe 2017).

There are no known occurrences of Bebb's willow in the project area, but there may be habitat present in the upper elevations of the Alma Mesa allotment. If there are unknown individuals in the project area, they may be impacted by the proposed action. Although recruitment of juvenile or sapling plants can vary greatly at different sites, proposed conservative use levels and dormant season use in the most of the upper elevations on the Alma Mesa allotment where it may occur should be conducive for recruitment of Bebb's willow.

This alternative is not likely to cause a trend to Federal listing or loss of viability. The risk is low to impacts individual plants and impacts would be expected to be insignificant and discountable.

Mogollon death camas (*Anticlea mogollonensis*) and Gila thistle (*Cirsium gilense*) – Mogollon death camas is endemic to the Mogollon Mountains on the Gila National Forest. It has been documented from five sites, primarily located in the Gila Wilderness. It occurs in the understory of upper montane and subalpine coniferous forest, often with aspen, between 9,000 and 10,500 feet. Only the upper portion of the Dry Creek allotment near Black Mountain is at these elevations. Livestock grazing is not common there and livestock do not usually graze death camas.

Gila thistle is a large (up to 6 feet) yellow-flowered thistle only known to occur in Catron County, New Mexico and adjacent Arizona. It occurs in moist areas along streams and drainage bottoms or mountain meadows in montane coniferous forest above 7,000 feet. In 2016, Roth reported the species was previously under documented and is considered secure despite the disturbances (from Whitewater-Baldy Fire) to its habitat.

There are no known occurrences of Mogollon death camas or Gila thistle in the project area. However there is potential that individual plants could be trampled if present. However, those impacts are expected to be insignificant and discountable. This alternative is not likely to cause a trend to Federal listing or loss of viability.

Hess' fleabane (*Erigeron hessii*) is endemic to the Gila Wilderness in the Mogollon Mountains of Catron County, New Mexico. This species is known from two rock outcrops in upper montane to subalpine conifer forests from 9,500 to 10,200 feet (New Mexico Rare Plant Technical Council 1999). NatureServe (2017) reports known populations of this species are within the Gila Wilderness and are not threatened by any current land use.

There are no known occurrences within the project area. Due to the described habitat of rock outcrops in higher elevations, it is unlikely livestock grazing and the associated management activities would impact this species. It is not likely to cause a trend to Federal listing or loss of viability.

Sonora sucker (*Catostomus insignis*) and desert sucker (*Catostomus clarki*) are both present in the San Francisco River. Potentially suitable habitat occurs in an estimated 46 miles of stream in the San Francisco River or some tributary streams within the project area. Sonora suckers occur primarily in pool habitats and spawn in smaller streams over gravel substrates. Desert suckers adults tend to use pools during the day and move to riffles at night. Gravel and cobble substrate is utilized for spawning. The majority of their habitat (San Francisco River) is excluded from grazing. The project proposes additional fencing to further exclude livestock grazing on the San Francisco River and Dix Creek, which should increase protection to suitable habitat for this species.

The addition of new wells, should have minimal impacts since they would occur well outside of occupied or potential habitat, and measurable changes to flow are not expected. Some effects that originate in tributary streams, springs, or uplands could potentially produce some effects in suitable habitat located downstream or downslope.

This alternative may impact individual suckers, but is not likely to cause a trend to Federal listing or loss of viability for either the Sonora sucker or the desert sucker.

Roundtail chub (*Gila robusta*) are not believed to occur in the San Francisco River but have recently been reintroduced into the Blue River just outside the project area. It is assumed suitable habitat may still be present within portions of streams in the project area; therefore, this species is included in the analysis.

Some effects that originate in tributary streams and springs or uplands could potentially produce some effects in suitable habitat located downstream and downslope. It is conceivable individuals from the reintroduced population in Blue River could migrate downstream into the project area (San Francisco River near Hickey and Pleasant Valley allotments).

This alternative may impact individual roundtail chub (potentially suitable habitat) but is not likely to cause a trend to Federal listing or loss of viability.

Lowland leopard frogs *(Lithobates yavapaiensis*) are believed to be extirpated from New Mexico. The current distribution within project area allotments in Arizona are not well known, but occurred historically in multiple areas within the San Francisco River drainage. Lowland leopard frogs have been observed in Dix Creek and the lower reach of Right Prong Dix Creek on the Pleasant Valley allotment, and it is assumed suitable habitat is present. The species could currently occur within some project area waters on the Blackjack, Copperas, and Hickey allotments.

Habitat suitability varies greatly within the San Francisco River due to water quantity and the presence of nonnative predatory and competitive species. Suitable habitat in the river drainage itself is likely limited to select reaches, especially those with off-channel habitat that may harbor lower numbers of nonnative species.

The majority of potentially suitable habitat (San Francisco River) is excluded from grazing. The project proposes additional fencing to further exclude livestock grazing on the San Francisco River, lower portions of Right Prong Dix Creek and Left Prong Dix Creek, and Dix Creek, which should increase protection to suitable habitat.

Potential changes in water flow are not expected to be measurable and thus should have minimal impacts. An increase in artificial waters (for example, tanks, and troughs) would occur in multiple

areas, which could potentially be utilized by this species. Effects that originate in tributary streams and springs or uplands could potentially produce some effects in suitable habitat located downstream and downslope.

This alternative may impact individual lowland leopard frogs but is not likely to cause a trend to Federal listing or loss of viability.

Dashed ringtail (*Erpetogomphus heterodon*), *Lepidostoma knulli*, and *Limnephilus granti* (caddisflies) are not known to occur in any project area waters, though suitable habitat could be present. Dashed ringtail has been documented in New Mexico but not Arizona. They occur in cool, clear mountain springs and streams. *L. granti* is only known to occur in springs and their outlets.

A large portion of potentially suitable habitat (San Francisco River) is excluded from grazing, similar to other species described above. Impacts could occur within other habitat types such as springs and smaller streams. Potential changes in water flow should have minimal overall impact to potentially suitable habitat since measurable changes to natural waters are generally not expected to occur, even at the local level. This alternative may impact individual*s* but is not likely to cause a trend to Federal listing or loss of viability for these three species.

Management Indicator Species

Per the Apache-Sitgreaves forest plan, management indicator species are referred to and managed as focal species. These species are analyzed at the forest level rather than at the project level such as this. Therefore, the following effects analysis of management indicator species is solely for the Gila National Forest portion of the project area. Management indicator species are analyzed at three levels: regional, forest and project. This project-level analysis tiers to the Gila forest-level analysis. The habitat type the management indicator species represent and the allotments on which they occur are displayed in table 17.

Effects to common black hawks and northern goshawks are disclosed above in the “Sensitive Species” section. Effects to Mexican spotted owls and Gila trout are disclosed above in the “Threatened Species” section. Therefore, the analysis of effects to individual management indicator species will only address mule deer and Mearn’s quail. For these species, the proposed action activities would not modify existing habitat, the species is unlikely to show response to alternatives, or both.

On the Gila National Forest, the proposed action would have no effect to the forestwide trend for the following management indicator species: common black hawk, northern goshawk, Mexican spotted owl, and Gila trout. Any impacts will not alter the existing trends, regardless of the direction of that trend.

Mule deer are indicators for desert shrub on the Gila National Forest. Grazing managed at light to conservative use levels has been established to move rangeland conditions toward desired future conditions. The adaptive management proposed for these allotments emphasizes utilization monitoring to identify when action is needed to ensure overgrazing doesn’t occur which tends to shift domestic livestock grazing from grasses to browse species that mule deer are more dependent upon, particularly in winter.

Construction and maintenance of proposed water improvements would also be beneficial for mule deer by providing more reliable water sources. This would spread out deer herds and cattle and make more habitat available.

The Gila National Forest mule deer population is currently in a slow, long-term downward trend. The proposed action will have no effect to the forestwide trend; any impacts will not alter the existing trends, regardless of the direction.

Table 17. Management indicator species, habitat type, and allotment

Species	MIS Habitat Type	Selected for Analysis	Allotment Occurrence
Mule deer (*Odocoileus hemionus)*	Desert scrub/pinyon juniper/shrub oak	Yes	Dry Creek, Sacaton, Potholes, Citizen, Alma, Pleasanton, Holt Gulch
Mearn's quail (*Cyrtonyx montezumae*)	Plains grass/mountain grass	Yes	Dry Creek, Sacaton, Potholes, Citizen, Alma, Pleasanton, Holt Gulch
Gila trout (*Oncorhyncus gilae*)	High-elevation riparian	Yes	Dry Creek
Common black hawk (*Buteogallus anthracinus)*	Low to mid riparian	Yes	Dry Creek, Sacaton, Potholes, Holt Gulch, Citizen, Pleasanton
Northern goshawk (*Accipiter gentilis)*	Ponderosa pine	Yes	Dry Creek, Sacaton, Holt Gulch
Long tailed vole (*Microtus longicaudus)*	Wet meadows and wetlands	No	Dry Creek
Beaver (*Castor canadensis)*	Low, mid, and high riparian	No	Potholes, Citizen, Pleasanton
Mexican spotted owl (*Strix occidentalis lucida*)	Mixed conifer	No	Dry Creek, Holt Gulch, Sacaton,
Hairy woodpecker (*Leuconotopicus villosus)*	Ponderosa pine and mixed conifer, snag component	No	Dry Creek, Sacaton, Potholes, Citizen, Alma, Pleasanton, Holt Gulch
Plain (juniper) titmouse (*Baeolophus ridgwayi*)	Pinyon juniper/shrub oak	No	Dry Creek, Sacaton, Potholes, Citizen, Alma, Pleasanton, Holt Gulch

Effects to common black hawks and northern goshawks are disclosed above in the "Sensitive Species" section. Effects to Mexican spotted owls and Gila trout are disclosed above in the "Threatened Species" section. Therefore, the analysis of effects to individual management indicator species will only address mule deer and Mearn's quail. For these species, the proposed action activities would not modify existing habitat, the species is unlikely to show response to alternatives, or both.

On the Gila National Forest, the proposed action would have no effect to the forestwide trend for the following management indicator species: common black hawk, northern goshawk, Mexican spotted owl, and Gila trout. Any impacts will not alter the existing trends, regardless of the direction of that trend.

Mule deer are indicators for desert shrub on the Gila National Forest. Grazing managed at light to conservative use levels has been established to move rangeland conditions toward desired future conditions. The adaptive management proposed for these allotments emphasizes utilization monitoring to identify when action is needed to ensure overgrazing doesn't occur which tends to shift domestic livestock grazing from grasses to browse species that mule deer are more dependent upon, particularly in winter.

Construction and maintenance of proposed water improvements would also be beneficial for mule deer by providing more reliable water sources. This would spread out deer herds and cattle and make more habitat available.

The Gila National Forest mule deer population is currently in a slow, long-term downward trend. The proposed action will have no effect to the forestwide trend; any impacts will not alter the existing trends, regardless of the direction.

Mearns' quail, also known as Montezuma quail, is an indicator of plains and mountain grasslands and are present in most of the mountain ranges in southeastern Arizona, southwestern New Mexico, southwestern Texas, and northwestern Mexico. The trend for the species on the Gila is thought to be stable. The proposed action will have no effect to the forestwide trend; any impacts will not alter the existing trends, regardless of the direction of that trend.

Grazing managed at light to conservative use levels have been established to move rangeland conditions toward desired future conditions. The effect of the implementation of the proposed action on the amount of plains and mountain grassland would be minimal. There would be continued establishment of pinyon-juniper on the allotment. There is the potential for some loss of grassland habitat due to succession or encroachment of pinyon, juniper, and pine into historic grasslands. However, due to the slow succession of pinyon-juniper, and the continuation of prescribed fire and wildfires on the district, it is unlikely there would be a measurable change in the amount of grassland habitat during the next 10 years. There would be no measurable change in the amount of plains or mountain grassland as a result of the proposed action; therefore, there would be no change in the amount of Mearn's quail habitat.

This proposed action is expected to maintain the quantity and quality of suitable habitat for this species. The Gila National Forest population is expected to remain stable.

Migratory Birds

Executive Order 13186 places emphasis on conservation of migratory birds. The order directs agencies to avoid measurable negative effects at the population level of migratory bird species, not the project level, unless a project would have measurable effects to a species' entire population. No measurable negative effects are expected to migratory birds from the proposed action.

For the following species, nests or eggs may be dislodged by livestock or management activities infrequently, but unintentional take would not rise to a level that affects the total population size.

- American dipper
- MacGillivray's warbler
- black-chinned sparrow
- gray flycatcher
- black-throated gray warbler
- greater peewee
- olive warbler
- Virginia's warbler
- Grace's warbler

The proposed action is not expected to impact nests, eggs or individuals of the following species:

- prairie falcon
- black swift
- Williamson's sapsucker
- red-faced warbler
- flammulated owl
- ferruginous hawk
- green-tailed towhee
- crissal thrasher
- Scott's oriole
- elf owl
- Lucy's warbler
- summer tanager
- red-naped sapsucker
- Hammond's flycatcher
- painted redstart

Important Bird Areas – In New Mexico, the nearest important bird area is the Gila Bird Management Area, located more than 10 miles away from the project area. There is no association or important link between the bird communities within the project area and the Gila Bird Management Area.

In Arizona, on the Apache-Sitgreaves, the designated important bird area adjacent and within a portion of the allotments includes the Blue and San Francisco River systems and approximately a 3/4 mile buffer on either side of the rivers. This remote area provides refugia for 216 species of birds that have been documented within the important bird area, with an estimated 138 species likely breeding.

These rivers are important over-wintering areas. Livestock grazing is excluded from National Forest System lands along the Blue and San Francisco Rivers allowing for the natural regeneration of the riparian habitat and recovery of natural hydrological processes. The proposal to also exclude livestock grazing from Dix Creek, lower Right Prong Dix Creek, and a portion of Left Prong Dix Creek would increase the river miles and riparian habitat that would not be affected by grazing activities.

The project area upland habitat provides winter foraging areas for various hawks, songbirds, and the occasional shorebird. However, this area is not recognized as an important overwintering area because significant concentrations of birds do not occur here nor do unique birds or a high diversity of birds winter here. Retention of snags is an important consideration in ecosystem restoration efforts but not applicable to this project.

Cumulative Effects

This cumulative effects analysis relies on current environmental conditions as a proxy for the impacts of past actions, because the existing conditions reflect the aggregate impact of prior actions and events. Typically, past actions focus on those of the past 10 to 15 years. However, historic overgrazing and the exclusion of fire from the landscape prior to 15 years ago has had long-lasting effects. Some plant communities have crossed a threshold and reached a new stable state from which they will not return to the identified potential natural community.

Ongoing and reasonably foreseeable activities in the project area that are relevant to the effects listed, sensitive and management indicator species include recreation, firewood cutting, juniper removal projects, prescribed burning, and noxious weed treatment. Climate change, although it is not a management activity was also considered. Details are contained in the "Terrestrial Wildlife" report in the project record. There are no known occurrences of any sensitive plant species in the project area. The risk from these activities is low.

Alternative 1 – No Grazing

Under the National Environmental Policy Act, cumulative impacts are the incremental impacts of the proposed action when added to other past, present, and reasonably foreseeable future Federal, State, and private activities (40 CFR 1508.7). There would be no management activities proposed under the no-action alternative, yet there are effects expected from this lack of action. Those effects, when combined with the effects from other present and foreseeable future activities, would not likely add incrementally to a change in listed, sensitive, and management indicator species.

Alternative 2 – Proposed Action

The past, present, and foreseeable future activities have the potential to affect listed, sensitive, and management indicator species, with varying degrees of adverse and beneficial impacts. However, current management direction is designed to eliminate or reduce negative cumulative impacts by protecting listed, sensitive, and management indicator species from direct and indirect impacts.

The direct and indirect effects to listed, sensitive, and management indicator species habitats are expected to be minimal or beneficial under the proposed action. The direct, indirect, and cumulative effects expected from the action alternative is not expected to contribute to a downward population trend that would reduce the existing distribution of any of the R3 listed, sensitive, or management indicator species discussed in this analysis.

Cultural Resources

Each allotment contains important cultural resources. The objective is to protect heritage resources (historic and prehistoric sites). If cultural features or deposits or any Native America human remains or funerary objects are encountered during project activities the activities will be discontinued in the immediate area of the remains, and the tribe and State Historic Preservation Office personnel will be consulted with to evaluate their nature and significance.

The affected environment and environmental consequences for cultural resources are organized and described by state.

Affected Environment

Arizona – Within the project area, 7,577 acres in Arizona have been surveyed for cultural and heritage resources with 90 sites recorded.

The cultural sites are generally consistent with those of the surrounding areas on the Clifton Ranger District. Known heritage properties range from simple artifact scatters to prehistoric structural sites, and from items such as old cans to historic homesteads. Of the 90 recorded sites in Arizona, 61 (68 percent) are prehistoric sites, 20 (22 percent) are historic sites, and 7 (8 percent) are multicomponent sites with 2 unknown. Euro-American use of the allotment is related primarily to ranching and homesteading.

New Mexico - Within the project area, 19,068 acres in New Mexico had been previously surveyed for cultural and heritage resources. Of the 207 previously recorded sites, 86 were re-visited. An additional 1,974 acres were surveyed, with 54 new sites recorded.

Cultural sites are generally consistent with those of the surrounding areas on the Glenwood Ranger District of the Gila National Forest. Known heritage properties range from simple artifact scatters to prehistoric structural sites, and from can scatters to historic mining sites. Out of the 261 recorded sites in New Mexico, 167 (64 percent) are prehistoric sites, 77 (29 percent) are historic sites, and 17 (7 percent) are multicomponent sites.

The major prehistoric occupation of the allotments is that of the Classic Mimbres era (A.D. 1000 to 1150). Common sites associated with this time period include small- to medium-sized pueblos with associated artifact scatters.

Environmental Consequences

Both the no-action alternative and proposed action are considered to have no adverse effect to cultural resources if treatment and management recommendations are followed.

Alternative 1 – No Grazing

Arizona - The potential for heritage resources to be either directly or indirectly affected by livestock grazing would be eliminated. Without grazing, ground cover should increase, minimizing the impacts of erosion on cultural resource sites. Because no new range improvements would be constructed, no ground disturbing activity with the potential to affect heritage resources would take place.

New Mexico - As some cultural resources are grazing improvements (for example, historic stock tanks), the condition of these sites could be anticipated to deteriorate. In New Mexico, 28 sites are in this category. Deterioration of eligible and unevaluated or undetermined sites could adversely affect those cultural resources. However, impacts to prehistoric resources associated with grazing would be reduced.

Alternative 2 – Proposed Action

Arizona – Significant effects from grazing have not been identified at most sites. Of the 90 sites currently identified within the project area, additional requirements have been identified for 43. These range from avoidance, to additional condition assessments or monitoring, to an exclusion fence to protect a rock shelter. Most additional work at sites is based on proximity to proposed improvements.

For one corral proposed for removal from the grazing permit, the permittee would no longer be responsible to maintain it; however, it is considered a historic structure and would remain on the ground with further deterioration expected from a lack of maintenance.

A report (FS# 2016-01-084B) covering this project was submitted to Arizona State Historic Preservation Office, which concurred with a finding of “no adverse effect” on March 29, 2019.

New Mexico - Significant effects from grazing have not been identified at most sites, with only 5 of the 261 sites in New Mexico requiring standard monitoring and one requiring a protective exclusionary fence to prevent potential trampling. Consultation between the Gila National Forest and the New Mexico State Historic Preservation Office personnel was done for each allotment, with some addendums for proposed improvements. The State Historic Preservation Office personnel concurred with findings of “no adverse effect” for all allotments in June, 2018.

Both National Forests – Ground-disturbing activities would occur with the proposed structural improvements, and several cultural sites are close to the proposed improvements. Coordination with the archaeologist is a condition for implementing the proposed improvements. The exact location of the proposed improvements may be adjusted as needed to avoid cultural resource sites.

Proposed improvements for which a cultural resource survey has not yet been completed will require a separate clearance report prior to implementation. Proposed management activities are likely to maintain or improve vegetation cover and stable soils which would benefit cultural resources by reducing the visibility of sites and the movement of artifacts.

Cumulative Effects

Alternative 2 – Proposed Action

Multiple current and reasonably anticipated actions (and changes to conditions) within the project area have the potential to impact cultural sites. These include road and trail use and maintenance, recreational activities (for example, dispersed camping and fuelwood collecting), powerline maintenance and powerline fuels treatments, wildfire and prescribed burns, noxious weed control, drought, and climate change. Most of these have the potential to impact sites through directly disturbing deposits or through overall deterioration of soil stability, which can contribute to a loss of site integrity.

Impacts to cultural resources can include the removal, displacement of, or damage to artifacts, features, and or deposits of cultural material. For cultural resources considered eligible for inclusion on the National Register of Historic Places, this can also include alterations of a property's setting or context.

To some minor extent, the results of the proposed action, current management (increased vegetative cover and stable soils), or both have the potential to combine with other projects, like travel management, to increase vegetative cover. However, there are also many current uses and reasonable foreseeable actions that could decrease vegetative cover and soil stability. Ultimately, the additive effect of all other projects and activities within the allotment combined with the proposed action should be relatively limited.

Table 18. Summary comparison of environmental effects to cultural resources

Indicator and Measure	Alternative 1	Alternative 2
Sites monitored – specific to grazing impacts.	Recorded sites are monitored as part of the management of cultural resources.	7 specific sites were identified for monitoring of possible effects from livestock grazing.
Sites "protected" from grazing impacts.	351 known sites in the project area.	2 (eligible) sites would be fenced to exclude possible livestock impacts.

Purpose and need is to protect archaeological properties with historical or cultural importance.

Recreation

Affected Environment

Developed recreation facilities occur on 5 of the 14 allotments within the project area. Kiosks or information boards occur at 5 of the 12 trailheads in the project area. Table 19 summarizes the developed recreation facilities by allotment:

Table 19. Developed facilities by allotment

Allotment	Development
Alma Mesa	5 trailheads
Blackjack	2 campgrounds, 1 picnic site, 1 trailhead.
Citizen	1 trailhead
Dry Creek	3 trailheads
Holt Gulch	2 trailheads

Both developed campgrounds within the project area are in Arizona along Highway 78 on the east portion of the Blackjack allotment where livestock grazing would occur primarily during the winter months when recreation use is lower. Neither is fenced to exclude grazing, although a pasture division fence exists on the east side of the Blackjack Campground. The campground is a popular site for larger groups and events and includes 2 restrooms and 10 camping units. The Coal Creek Campground has 1 restroom and 5 camping units. Both are open year-round.

Although dispersed recreation is common throughout the project area, many areas are remote with minimal recreation activity occurring. There are approximately 121 miles of National Forest System trails within the project area with approximately 65 occurring on the Apache-Sitgreaves and 56 miles on the Gila.

It is expected recreation visitation would continue close to current levels and would not change due to the proposed action.

Environmental Consequences

Direct and Indirect Effects of Alternative 1 – No Grazing

Removal of livestock grazing would limit interactions between recreationists and permitted livestock. The removal of livestock would increase available herbaceous cover and feed for wildlife. This has the potential to increase wildlife viewing and better hunting opportunities. However, without maintenance of existing range improvements for water, there may be less water available for wildlife within the allotment as well as less water for hikers, pack and saddle livestock, and other recreationists.

Three commenters to the scoping notice expressed concern for observed livestock use along the San Francisco River which is closed to grazing. Under this alternative, the potential for livestock on the river would be reduced; however, unauthorized use by cattle from private inholdings or adjacent allotment may still occur.

Direct and Indirect Effects of Alternative 2 – Proposed Action

Livestock grazing may conflict with recreational use. It may displace visitors, make popular camping areas undesirable, and interfere with the wilderness experience. These social impacts area subjective and difficult to quantify.

Campgrounds: Under the proposed action, livestock use around the Coal Creek Campground, in the Coal Creek pasture (Blackjack allotment), would be limited to November through February. Due to a lack of dependable water in the Maverick Pasture (Blackjack allotment), the area around the Blackjack Campground is typically used by livestock in the winter months. There is minimal use of the recreation facilities in the winter months. Livestock use has been relatively compatible with recreational activities at these two developed campgrounds in the past and is expected to be similar in the future.

Trails and Trailheads: Overall there are no livestock issues with trails and trailheads that would necessitate alternatives or mitigation measures. The San Francisco Hot Springs Trailhead is located within ¼ mile of livestock water so when this pasture is grazed livestock may concentrate near the trailhead. Typically the pasture in which the trailhead occurs is grazed for approximately 2 months followed by 10 months of rest. Under adaptive management, district personnel can vary the season of use to manage around when the trailhead is used more often.

Dispersed Recreation: Some comments to the scoping notice and the preliminary environmental assessment expressed concern that the proposed water development on the Dry Creek allotment may adversely impact a dispersed campsite on the north side of Catron County Road 2-1. The proposed water development is over a mile from this area. Livestock use in not expected to increase beyond past use and should not adversely impact recreation activities in this area.

A potential conflict with grazing and recreation is when gates are difficult to open and close or are being left open where fences cross roads and trails. The proposed fence to close Dix Creek to livestock grazing would cross National Forest System Road 215; however, a cattleguard is also proposed as a mitigating measure. Two cattleguards are also proposed on Dix Mesa where gates are commonly left open.

On the Alma Mesa allotment, the proposed new fence in the northwest corner of the Alma Mesa pasture would cross Trail #41 and would be one more gate to open when using the trail to access Bear Valley. A design feature could be to include a walk-through feature or a self-closing gate. Also on the Alma allotment, a proposed new fence would cross National Forest System Road 168, a two-track road which receives minimal use and should not be an issue.

The proposal to add drift fences to better ensure livestock do not access the San Francisco River would improve recreational experiences for visitors along the river corridor, although unauthorized livestock access from private inholdings may continue. Much of the recreation activity in this area is likely to occur close to roads and water.

The proposed improvements at Webster Spring should improve conditions there, making it more enjoyable for recreationists.

The proposed water developments would be available for horseback riders and also available for wildlife, making them attractive to hunters. The proposed improvements would have some impact on visual aesthetics; however, these are a common sight on western ranges. Many of these improvements would be located away from roads and trails and not as visible due to the density of vegetation cover, reducing their impact.

There are no livestock issues with dispersed recreation that would necessitate alternatives or additional mitigation measures.

Cumulative Effects

Relevant ongoing and reasonably foreseeable activities include travel management involving road and trail use and maintenance, fire management including wildfires and prescribed burning and unauthorized livestock use.

Roads and Trails: Gila National Forest personnel completed a travel management assessment in 2013. A travel management assessment is currently ongoing on the Apache-Sitgreaves National Forests. Under the no-action alternative, trails in the allotment would be less traveled. As seen with other trails that receive less use, they eventually decline in condition and would require more future trail maintenance.

On the Apache-Sitgreaves National Forests, the permittee on the Alma Mesa allotment would be authorized to continue to use National Forest System Road 711 for maintenance of the Stateline Cabin well within the Blue Range Primitive Area. It is proposed to add 3 existing routes on the Blackjack allotment and 1 on the Hickey allotment as maintenance level 2 National Forest System roads, open to the public and to be included on the motor vehicle use map. The addition of these routes would provide recreational access for hunting and dispersed camping.

Fire: Prescribed fire activities are expected to continue with the Sunset Restoration Project within the new allotment boundaries of the Hickey and Blackjack allotments. Smaller restoration projects have occurred and may occur intermittently throughout the project area. Recent wildfires and subsequent flooding have impacted dispersed recreation, particularly in the Gila Wilderness. Because wildfires are not planned events, it is not possible to reasonably foresee future effects from them.

Proposed San Francisco River Pumped Storage Project: An application for a preliminary permit was recently submitted to the Federal Energy Regulatory Commission to conduct a feasibility study over a 36-month period for a proposed reservoir and hydroelectric plant on the San Francisco River, ¼ mile west of the Arizona-New Mexico state line. The proposed dam would back up water up to 10 river miles into New Mexico and would become a destination spot for recreationists. This area is already excluded from livestock grazing.

Table 20. Summary of environmental effects to the recreation resource

Resource Element	Indicator and Measure	Alternative 1 – No Action	Alternative 2 – Proposed Action
Developed recreation	Number of developed facilities sites that could be effected	None. No developed recreation facilities would be effected	Two campgrounds. Limited to winter months when recreation use is minimal. No increase from current situation.
Dispersed recreation	Number of popular dispersed sites and activities that could be effected	None	Twelve trailheads, 121 miles of trails, and numerous dispersed sites. No significant issues with livestock grazing and dispersed recreation.

Special Management Areas

Affected Environment

The Blue Range Primitive Area was designated on June 21, 1933 and is the only designated primitive area. It encompasses 199,502 acres of which 33,495 occur within the project area. The Blue Range Primitive Area is managed as wilderness, with one exception: the area is not withdrawn from mineral prospecting and mineral development. Therefore, the term wilderness will be used interchangeably with the primitive area. In the Blue Range Primitive Area, approximately 1.6 miles of new fence, 3 water storage tanks, 3 troughs, a solar panel, and 2.9 miles of pipeline are proposed to be installed (figure 2) and 1.3 miles of existing fence would be removed.

Wilderness: Per the 1964 Wilderness Act, "the grazing of livestock, where established prior to the effective date of this Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture". Livestock grazing was established on each of the allotments within the project area prior to 1964.

Portions of two wilderness areas occur within the project area. The Gila Wilderness occurs on the Dry Creek (17,871 acres), Sacaton (874 acres) and Holt Gulch (2,786) allotments and the Blue Range Wilderness occurs on the Alma Mesa (58 acres) allotment. The Forest Service administratively recognized the Gila as wilderness in 1924. It later became the first congressionally designated wilderness in 1964. The Blue Range Wilderness was designated in 1980.

There are 1.6 miles of fence along the Blue Range Wilderness within the project area. There are no existing range improvements in the Gila Wilderness within the project area. No new improvements are proposed within designated wilderness.

Portions of two wilderness study areas occur within the project area: Hell Hole and Lower San Francisco. There are 462 acres of the Hell Hole Wilderness Study Area on the Blackjack allotment. On the Lower San Francisco Wilderness Study Area, 463 acres occur on the Dry Creek allotment, 2,889 on the Pleasanton allotment and 1,263 acres on the Potholes allotment. No new improvements are proposed in the wilderness study areas.

Inventoried Roadless Areas: There are approximately 79,990 acres of inventoried roadless areas within the project area, including the Hells Hole, Lower San Francisco, Mitchell Peak, San Francisco, and Sunset (

figure 2). Approximately 58 percent of the inventoried roadless areas occurs within 3 allotments: Blackjack, Hickey, and Pleasanton. Inventoried roadless areas are managed to protect and conserve their roadless character. Several of the proposed new improvements would occur within inventoried roadless areas and approximately 3.6 miles of fence would be removed from inventoried roadless areas. No new roads are proposed within inventoried roadless area boundaries.

Wild and Scenic Rivers: There are no designated wild and scenic rivers within the project area. Three are considered eligible for further study to determine if they should be recommended to Congress for designation: Little Blue Creek and the San Francisco River in Arizona and Spruce Creek in New Mexico. Eligible wild and scenic rivers are managed to retain their free-flowing nature and outstandingly remarkable values that make them eligible until a suitability determination has been made whether to recommend their inclusion in the National Wild and Scenic Rivers System.

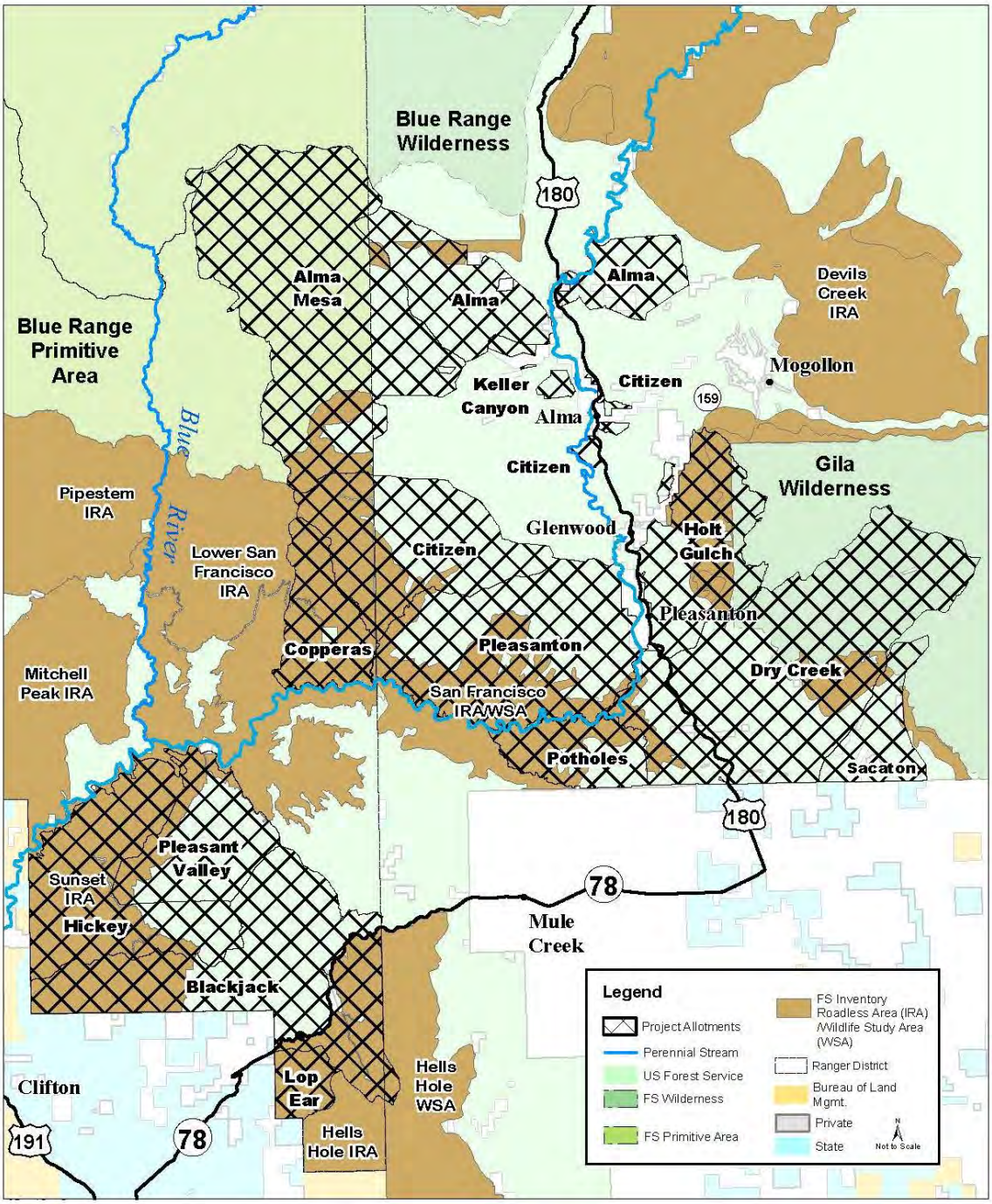


Figure 2. Special management areas in the Stateline Range project area

Environmental Consequences

Direct and Indirect Effects of Alternative 1 – No Grazing

The wilderness portions of the Dry Creek and Holt Gulch allotments are in the upper, steeper elevations of the allotments where minimal livestock grazing occurs. However, just a small number of livestock can decrease the feeling of solitude.

With the removal of livestock, the qualities of wilderness character would likely improve in the wilderness, wilderness study area, and primitive area portions of the project area. Removal of range structures would improve the visual quality in the primitive area by making it less developed.

Within the primitive area on the Alma Mesa allotment, the interior fences and the boundary fence that borders the closed Sandrock allotment may be removed along with water facilities and corrals if funding becomes available. Approximately 41 miles of fence, 1 well, 3 miles of pipeline, 2 troughs, and 10 corrals could be removed. Thirteen dirt tanks and the 1.1 mile access road to Stateline Cabin would no longer be maintained.

The environmental impacts from past livestock grazing activities are expected to persist for many years to come. As described in the "Range" report, many plant communities have crossed a state-and-transition threshold and are in a stable state that is not likely to change with changes in grazing management alone. Some areas exhibit a low- to mid-similarity ecological condition class or have the potential to move back into the mid-similarity class but may not move back to potential natural conditions.

Direct and Indirect Effects of Alternative 2 – Proposed Action

Wilderness

Occasional use of motorized equipment may be permitted on a case-by-case basis where practical alternatives are not available and such use would not have a significant adverse impact on the natural environment. Such motorized equipment uses are only permitted in those portions of a wilderness where they had occurred prior to an area's designation as wilderness or where they are established by prior agreement. There is prior authorization in 1967 by the regional forester and again in 1975 by the Chief of the Forest Service authorizing the continued used of a "gasoline powered pump" at Stateline Cabin well, to drive on the road to Stateline Cabin to service the well, and to use mechanized equipment to maintain the service road.

As described in the congressional grazing guidelines, the construction of new improvements or replacement of deteriorated facilities in wilderness is permissible. However it should be primarily for the purpose of resource protection and the more effective management of these resources rather than to accommodate increased numbers of livestock.

The proposed structural improvements are for purposes of livestock management, particularly to improve livestock distribution in the area of the Alma Mesa and near the Stateline Cabin. No increase in numbers of livestock is proposed for the allotment occurring in the primitive area or wilderness. No new improvements are proposed within wilderness or wilderness study areas. Within the Blue Range Primitive Area, approximately 1.6 miles of new fence, 3 water storage tanks, 3 troughs, a solar panel, and 2.9 miles of pipeline were proposed. However, the proposed 0.75-mile fence to create a new trap west of West Trap is not considered a necessity.

Per the congressional guidelines, wilderness does not lend itself to construction of substantial new facilities that might be appropriate for intensive grazing management in non-wilderness areas. There are 3 existing traps and 2 smaller pastures near the Stateline Cabin area. Thus, adding another trap appears to be more for convenience than a necessity.

A minimum requirements analysis was conducted using the minimum resource decision guide as a guide for findings and recommendations with regards to the proposed new improvements within the primitive area. The analysis was approved on January 28, 2019. As mentioned above, the proposal to construct approximately 0.75 miles of fence to create a small trap between West Trap and the edge of the Little Blue Creek drainage in T1N, R32E, Section 7 SW is not recommended. The following activities are recommended within the Blue Range Primitive Area per the findings of the minimum requirements analysis.

- Installations: Approximately 0.8 miles of fence, 2.9 miles of pipeline, 3 storage tanks, 3 troughs and a solar panel and stand.
- Mechanical transport: Helicopter, motorized vehicles, or both to transport 3 storage tanks and 3 troughs. Maximum estimated flight time would be 3 hours of flight time for 6 flights. Motorized vehicle to transport approximately 2.9 miles of pipeline and a solar panel and stand to Stateline Cabin using National Forest System Road 711, then use pack animals to transport the pipe cross-country to the two proposed water lines. Hand dig the holes for the solar panel stand posts.
- Fence materials will be transported using pack animals for the 0.8 mile fence in the northwest corner of the Alma Mesa pasture in T2N, R32E, Section 30 SW and Section 31 NW.
- Motorized equipment: Equipment to install and bury the pipeline such as a dozer with a ripper shank or a trencher, a helicopter and possibly a rock drill, if needed, to install the fence.
- Motor vehicles: Truck and trailer for transporting materials.
- Temporary roads: Cross-country travel possible but no temporary roads.

Forest Service personnel will need to be on site during each use of mechanized equipment to limit resource impacts and to document the extent of authorized prohibited tools and installation of improvements.

The following mitigation measures will be applied:

- pipelines will be buried where feasible with rehabilitation of the trench line to make it appear as natural as possible
- improvements will not be in places that are easily seen such as near trailheads, silhouetted on ridgetops and in popular areas
- materials will have darker, earthy tones and colors that blend in better with the surrounding area
- any transport of materials or construction of proposed improvements near Mexican spotted owl protected activity centers will occur outside of the breading season

Range improvements can impact the visual qualities of visitor experiences, particularly in wilderness and primitive areas where there is a greater expectation not to encounter evidence of human developments. However, areas of high livestock concentration resulting in poor or unsatisfactory condition can also adversely affect visual quality. Congressional intent is that range improvements in wilderness and primitive areas are acceptable to support a livestock grazing program.

Installing a solar panel and only using the diesel-powered generator as a backup for the Stateline Cabin well would eliminate most of the noise intrusion and could also result in less need for motorized access for fuel and maintenance of the diesel pump. It would be more visually obtrusive but would be in a low area where the sight distance is minimal—approximately 100 yards and located near other structures such as the cabin, barn, and corrals where there is already an appearance of human presence so visual impacts would be concentrated into a fairly small area.

Wilderness characteristics that are mandated by law to be protected within wilderness or primitive areas are untrammeled, undeveloped, natural and opportunities for solitude or a primitive and unconfined type of recreation. Untrammeled is the wild quality of wilderness. It means being unbound, unhampered, and where ecological and evolutionary forces are allowed to operate without restraint, modification, or manipulation.

Constructing the proposed improvements would better control use and improve livestock distribution which in turn would maintain or improve ecological conditions, but they would give the feeling of modification or manipulation versus being unbound or unhampered. However, constructing the proposed 0.8 mile fence in the northwest corner of Alma Mesa, would allow approximately 1.3 miles of existing fence in Yam Canyon and Little Blue Creek to be removed.

Constructing water improvements would enhance the availability of water over what would occur naturally and would affect the surrounding environment. The resulting conditions are different than what would have occurred in the area absent human manipulation or intervention. Water improvements may be necessary for management of grazing and in keeping with the intent of the congressional grazing guidelines but would be a negative effect to the untrammeled quality of wilderness character.

An undeveloped wilderness quality focuses on how “the imprint of man’s work will remain substantially unnoticeable.” This quality is degraded by the presence of structures, installations, and the use of motorized or mechanical equipment. Adding additional improvements would have a negative effect on the undeveloped character regardless of the type of fence constructed or the materials used for fences and waters. How the site would be accessed and the equipment used could also impact the undeveloped character with the imprint of man’s work remaining for several years. A natural wilderness characteristic pertains to the protection, impairment, or restoration of natural conditions such as air, water, soil, wildlife, plants (including threatened and endangered species), and biological diversity.

Wilderness is essentially free from the actions of modern human control or manipulation and the presence of the improvements adds to the human presence and influence. However, as stated above, the proposed 0.8-mile fence in the northwest corner of the Alma Mesa pasture would lessen the impact of livestock grazing on the natural processes in the ecosystem by reducing or better controlling the intensity, duration and season of use on Little Blue Creek and Yam Canyon.

Improved livestock distribution in the area of Alma Mesa would also better allow natural processes to take their course and help improve conditions to be more representative of potential natural conditions. However, restricting livestock access to Little Blue Creek and Yam Canyon would concentrate livestock near the sole dependable water source at Stateline Cabin, adversely affecting the naturalness of that area. The proposed new water sources would mitigate this and would be expected to improve livestock distribution which should improve upland and riparian conditions and reduce the effects of grazing, on ecological systems, benefiting the natural quality of wilderness character.

Wilderness is managed to retain its primeval character and influence and is intended to be essentially without permanent improvement or modern human occupation. The presence of additional permanent improvements would impact the feeling of solitude and being away from human influence. The proposed storage tanks could not be transported by hand and would require temporary use of either a helicopter or cross-country travel with a vehicle. The proposed solar panel would mitigate the intrusive sounds of the authorized diesel generator at Stateline Cabin well, which would add to the feeling of solitude in that area.

Inventoried Roadless Areas

Several of the proposed new improvements would occur within inventoried roadless areas, including approximately 10 miles of fence and 11 miles of water pipeline ,1 well, 1 trick tank, 2 corrals, 9 water storage tanks and 14 water troughs,. No new roads are proposed within inventoried roadless areas. It is also proposed to remove 2 stock dirt tanks and approx. 3.6 miles of fence from within inventoried roadless area boundaries.

Under this alternative, inventoried roadless areas would maintain their overall roadless characteristics. The proposed action would not result in the construction or reconstruction of roads within an inventoried roadless area. Water developments and fencing are consistent with the recreation opportunity spectrum classes and common on the grazing allotments but are not expected to occur as often in areas designated as primitive.

Effects to soil, water, air, plant and animal communities, threatened and endangered species, traditional cultural properties and sacred sites are addressed in their respective sections of this environmental assessment.

The proposed action would not affect public drinking water, reference landscapes, natural-appearing landscapes with high scenic quality, or other locally identified unique characteristics within the inventoried roadless areas.

Cumulative Effects

Under the no-action alternative, the road to Stateline Cabin that is administratively available to the permittee, but not the general public, may be closed. This would improve the quality of the wilderness character in the Blue Range Primitive Area. No prescribed burns or other restoration activities are reasonably foreseeable within the primitive or wilderness areas. Gila National Forest personnel are currently revising the forest plan which may include recommending additional wilderness and wild and scenic rivers within the project area for Congress to consider designating. The proposed San Francisco River Pumped Storage Project would occur within the Lower San Francisco Wilderness Study Area. This area is already excluded from livestock grazing.

Table 21. Summary of environmental effects to special management areas

Indicator and Measure	Alternative 1 – No Action	Alternative 2 – Proposed Action
Number and miles of man-made facilities - impact to undeveloped quality of wilderness character	There are approximately 54 miles of fence, 1 well, 3 miles of pipeline, 2 troughs, 10 corrals, 13 dirt tanks, 2 cabins, and 1.1 miles of road within the Blue Range Primitive Area and 1.6 miles of fence along the boundary of the Blue Range Wilderness. Under this alternative, approximately 41 miles of fence, 1 well, 3 miles of pipeline, 2 troughs, 10 corrals, 13 dirt tanks, and the 1.1 mile access road to Stateline Cabin, within the Blue Range Primitive Area would no longer be needed.	Approximately 1.6 miles of new fence, 3 water storage tanks, 3 troughs, and 2.9 miles of pipeline are proposed to be added in the Blue Range Primitive Area. After installing the 0.8 mile proposed fence in the northwest corner of Alma Mesa, approximately 1.3 miles of existing fence in Yam Canyon and Little Blue Creek could be removed.
Qualitative assessment of impacts to wilderness values.	The wilderness character would improve with the removal of facilities and absence of livestock. Over time the areas would appear more natural and less trammeled and developed.	Effects to wilderness study areas and wilderness would remain unchanged. For the primitive area, the 0.75 mile of proposed fence to create a new trap pasture does not meet the minimum requirement. The proposed solar panel would improve the solitude quietness but add to the visual impairment. The proposed 0.8 mile fence and water developments in the Alma Mesa pasture would improve livestock distribution and, in turn, plant diversity, soil and watershed conditions and improved ecological processes which would improve the natural qualities. However, their presence would adversely affect the undeveloped and unconfined qualities of wilderness character.

Climate Change – Both Alternatives

Effects of Climate Change on this Project

There is still a great deal of uncertainty as to the direction and magnitude of vegetative changes that may occur due to climate change. However, it is considered likely there will be an increase in extremes, such as higher air temperatures; continued increase in atmospheric pressure; changes in precipitation regimes; longer, more frequent drought; and shorter fire return intervals.

Potential impacts to natural resources due to climate change are likely to be varied. In the Southwest, a particular concern is the uncertainty around precipitation and the potential for extended periods of drought stressing already uncertain water supplies (Karl et al. 2009).

Grazing permittees have historically adjusted their livestock operations to adapt to changing climatic conditions and economic concerns. However, with the climate change projections that describe increases in the frequency and extreme fluctuations beyond those previously experienced, greater adaptability will be required to minimize failure and abandonment of livestock operations. In the Southwest, warming and reduced precipitation could synergistically decrease soil water availability, diminishing both the amount and nutrient content of plant production and altering plant community composition (Briske et al. 2015). Because of the uncertainties involved, adaptive management is considered an effective tool for dealing with climate change on the landscape (Brennan 2008). The proposed action incorporates adaptive management and is expected to increase the ability to deal with climate change.

Effects of this Project on Climate Change

It is accepted that methane gas from ruminants contributes to the greenhouse gases that accelerate climate change (Brown 2008). However, it is unlikely the methane emitted by livestock grazing in the project area would be measurable. It is estimated the no-action alternative would produce 0 percent of the national annual methane production and the proposed action would produce 0.004 percent to 0.007 percent, assuming the livestock are not simply grazed somewhere else.

Given the lack of Federal standards related to greenhouse gas emissions, any data and conclusions developed through quantitative analysis methods are used only for comparing alternatives. Without sufficient scientific understanding to draw conclusions about the significance of the quantitative results, it is not meaningful to disclose more than this.

Another consideration related to climate change is carbon sequestration. The Environmental Protection Agency (EPA) recognizes improved livestock management can help reduce atmospheric concentrations of carbon dioxide through the mechanism of soil carbon sequestration on grazing lands. Even though plant material is harvested by grazing animals, with grazing management, the residues accumulate and increase the amount of organic matter in the soil, where it remains instead of being released back into the atmosphere as carbon dioxide (EPA 2007). The no-action alternative would result in the most vegetation residue remaining, and therefore, the most carbon sequestration in the project area. However, as discussed earlier, livestock removed from the project area under the no-action alternative may use other areas.

Socioeconomics

Affected Environment and Environmental Consequences

Six commenters to the scoping notice raised concerns or had questions related to the proposed structural improvements. Based on this input it was identified as a topic to address. Several commenters to the preliminary environmental assessment identified potential social and economic impacts as an issue.

The county level is appropriate for conducting an economic analysis for a project such as this. Nonmarket values in the project area such as sightseeing, and various recreational activities, are not expected to change in any meaningful sense under either alternative.

Greenlee County, Arizona contains 1,848 square miles or 1.6 percent of the land area of Arizona. Of Arizona's 15 counties, it is the second smallest for land size. With an estimated population of 9,368 it is, by far, the least populated county in Arizona with less than half the population of the 14th county.

Catron County, New Mexico contains 6,924 square miles or 5.7 percent of the land area in New Mexico. It is the largest of New Mexico's 33 counties but is the third least populated with an estimated population of 3,547.

Grant County, NM contains 3,962 square miles or 3.3 percent of the land area in New Mexico. Its population ranks it fifteenth of 33 counties in the state with an estimated population of 28,382.

The main industries or each county varies. Employment in Greenlee County is greatly dependent on mining and associated construction with the largest copper mining operation in North America and one of the largest in the world. In Catron County, the main employment industries are farm and government compared to government and retail trade in Grant County. In Greenlee and Grant Counties, agriculture employment as a percentage of total employment, is 2 to 3 times the national average while Catron County is 16 times the national average.

Federal Land Payments

Federal lands make up a large percentage of these counties. Federal land payments are made to state and local governments through various programs to compensate for nontaxable Federal land within their borders (table 22). Twenty-five percent of grazing receipts are paid to the states where the national forest lands are located. In 2015, the New Mexico Range Improvement Task Force estimated the value of an animal unit month for the economy in the Catron County area to be $80.34 per animal unit month. Adjusted for inflation, the estimated current value is $85.11 per animal unit month. This estimated value considers the multiplier effect of these local independent businesses on the local economy. Table 23 shows the estimated economic contributions under current management and by alternative.

Table 22. The 2017 distribution of federal land payments to the three counties in the project area

County	County Government	Local School Districts	RACs	Grazing Districts	Total
Greenlee	$1,315,435	$364,462	$128,634	$42,528	$1,851,059
Catron	$1,973,417	$1,164,187	$219,141	$151,787	$3,508,532
Grant	$2,559,781	$355,978	$67,008	$108,459	$3,131,227
Total	$5,888,633	$1,884,627	$414,783	$302,774	$8,490,817

RAC = Resource Advisory Committee. Resource advisory committees provide advice and recommendations to the Forest Service concerning Title II funds for projects and funding consistent with the Secure Rural Schools and Community Self-Determination Act and the Federal Advisory Committee Act.

Table 23. Summary of estimated economic contributions by alternative

Indicators	Current Management	Alternative 1	Alternative 2
Annual grazing fee receipts at permitted numbers	$68,991	0	$66,947
Grazing fees receipts at recent actual use levels	$34496 to $46,224	0	$33,473 to $44,854
Economic contribution to the local economy at permitted numbers	$3,869,271	0	$3,760,670
Economic contribution to the local economy based on recent actual use percentages	$1,934,635 to $2,592,411	0	$1,880,335 to $2,519,649

Alternative 1 – No Grazing

This alternative would eliminate livestock grazing on National Forest System lands within the project area; no term grazing permits for livestock grazing would be authorized, resulting in a 100 percent reduction in the existing permitted livestock use.

Range Improvements

No new structural range improvements are proposed under this alternative. Range improvements such as interior fences, corrals, water lots, pipelines, and troughs would be removed as time and funding permits. Water developments beneficial to wildlife and recreational stock may be retained if funding is secured for maintenance by benefiting program areas or through cooperative volunteer programs. Where necessary, maintenance of allotment boundary fences would be reassigned to adjacent permittees, affecting them financially.

Social

This alternative would impact the livelihoods and lifestyles of the permittees and ranch employees on 13 ranch operations. It would also affect the economic activities associated with the current permits which would have a ripple effect throughout the three counties and small communities within the project area and to the Forest Service.

The absence of livestock on the landscape would be noticeable under this alternative and while some would enjoy their absence, the balance of the other multiple uses is not expected to change noticeably. Other activities such as hunting, camping, wildlife watching, and harvesting of other forest products would be expected to continue near current levels.

Economic

Compared to full permitted numbers, the no-action alternative would result in an annual estimated loss of up to $68,991 in grazing fees to the U.S. Treasury with 25 percent or $17,248 not going to the three counties. Recent actual use has averaged from 50 percent to 67 percent of permitted numbers. Assuming the future stocking rates would remain similar, the estimated loss of grazing fees would be $34,496 to $46,224 with 25 percent being $8,624 to $11,556.

This loss of grazing fees and associated federal payments, by itself, is not substantial; however, the counties would also not benefit from revenues and expenses associated with the permitted livestock activities. The loss to the local economies, using the $85.11 animal unit month value to the local economies from full permitted numbers, is estimated at $3,869,271. Assuming future use would be similar to recent actual use numbers of 50 to 67 percent of permitted numbers, the loss to the local economies would range from $1,934,635 to 2,592,411 (table 23).

Alternative 2 – Proposed Action

This alternative would authorize grazing in the project area as described above. The total permitted animal unit months would be reduced by 1,276 animal unit months from 45,462 to 44,186 but for billing purposes the reduction would be 1,345 head months from 45,389 to 44,044 head months.

Range Improvements

As stated in the "Proposed Action" section, with noted exceptions, allotment management would not depend on the proposed range improvements nor are they proposed to increase numbers of permitted livestock. Improvements are be proposed for the more effective management of the resource.

Table 4 and table 5 in the "Authorization, Improvement, and Design Features" section summarize the proposed improvements by allotment. No improvements are proposed for the Holt Gulch or Potholes allotments.

The estimated costs below are for all proposed improvements. Because some may not be implemented, actual costs may be less.

As stated in the "Public Involvement" section, one issue is to identify the suitable number and kinds of structural improvements to help manage livestock grazing while considering costs and maintenance needs. With this in mind, the original amount of proposed improvements was reduced by 5 wells as well as several troughs, storage tanks and miles of pipeline resulting in the numbers shown in table 4. Divided among the 14 allotments, the proposed number of new improvements equates to an average of approximately 1.2 miles of new fence, 2 storage tanks, 4 troughs, and 3.3 miles of pipeline per allotment.

The number and miles of proposed new improvements are estimates only for planning purposes. The actual number may vary at the time of installation. Costs associated with transporting materials on site were not included in cost estimates.

Permittee investment would be encouraged by giving priority to projects that contain at least equal value contributions by the grazing permittee.

Improvement costs are typically divided between the agency and the permittee. Commonly, the agency provides the materials and the permittee the labor. The cost of materials is estimated at approximately $553,000 and labor at $564,000 which is close to 50 percent for each. Costs associated with water developments account for approximately 78 percent of the total.

Construction would depend on available funding and would extend over several years. Agency funds may include appropriated funds; however, in most cases, only range betterment funds are used. Range betterment funds are not appropriated funds but are collected from grazing fees which are returned to the national forest or region where they were derived for on-the-ground range improvement projects. Outside funding sources are also often used.

It would take approximately 10 years at current grazing fees with full permitted numbers, or 13 years at recent actual use levels, to cover the cost of materials. Depending on other funding sources, it may not be feasible to construct all of the proposed structural improvements. Therefore, those that are expected to provide the greater benefit would be installed first. If monitoring determines the priority proposed improvements are sufficient, the others may not be implemented. Once constructed, new improvements become property of the U.S. Government.

Social

Raising livestock to maintain a ranching lifestyle has been a common practice within the project area for approx. 130 years. The proposed action would reduce the current permitted number of livestock by 1,276 animal unit months or 3 percent of the total for the 14 allotments within the project area. This reduction in total permitted numbers is not expected to adversely affect any current ranch operation since the reduction is on the Pleasant Valley allotment.

This alternative would retain livestock production on public and some private lands which contributes to the long-term social and cultural diversity of the area and to the stability of local communities that helps preserve the rural landscape and lifestyle. This is particularly important to Catron County where approximately 23 percent of jobs are agriculture based.

No social group would be made vulnerable by Forest Service actions related to the issuance of livestock grazing permits. Participation by permittees and others in the ranching business in the community would be expected to remain the same, with any changes being the result of variables beyond the scope of the proposed action.

Economic

Using the past 10-year average of $1.52 per head month at full permitted numbers (44,186 animal unit months and 44,044 head months) as proposed under this alternative, the estimated annual grazing fee receipts would be up to $66,947 with 25 percent or $16,737 going to the three counties. This would be a reduction of $2,044 to the U.S. Treasury and a reduction of $511 to the counties from current permitted numbers.

The economic value to the economy would be reduced by $108,600 from current permitted numbers. At full permitted numbers in the proposed action, the animal unit month value to the local economies is estimated at $3,760,670. Based on actual use information (50 percent to 67 percent of permitted) and assuming future use would be at a similar level, the animal unit month value to the local economies would range from $1,880,335 to $2,519,649 (table 23).

Beef products: Although the proportion of beef Americans eat is declining and chicken has become the most popular meat, in 2017 Americans consumed an average of 57 pounds of beef. (Widmar 2108). Using an estimated calf crop of 82 percent (Hawkes and Libbin 2007) and assuming an average of 550-pound calves at 50 percent yield, (Arizona Cattle Grower's Association), it is estimated that up to 837,773 pounds of beef could be produced at full permitted numbers each year from cattle that could graze on the allotments within the project area which is equivalent to the beef consumption rate of 14,697 Americans.

Using recent actual use figures, the amount of beef produced within the project area has probably varied from 418,866 to 561,281 pounds of beef which is equivalent to the average beef consumption rate of 7,349 to 9,847 Americans which is enough for nearly all of the citizens of Greenlee County or about two thirds of Greenlee and Catron County combined.

Cumulative Effects

Each district administers grazing on additional allotments as well as those in the project area which may compete for improvement funding based on priority needs.

The allotments within the Stateline project area account for 16 percent, 9 percent, and 5 percent of the number of Forest Service allotments in Greenlee, Catron, and Grant Counties respectively and it's estimated any changes to the permits, including cancelling the permits per the no-action alternative, would impact the livestock industry and each county proportionately. Currently, approximately 13 percent of the Forest Service lands (415,594 acres) within the three counties are in within vacant or closed allotments.

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. Toward attaining environmental justice for all communities and persons in the United States, Executive Order 12898 (February 11, 1994) directed all Federal agencies to evaluate their proposed actions to determine the potential for disproportionate adverse impacts to minority and low-income populations.
In the memorandum to heads of departments and agencies that accompanied Executive Order 12898, the President specifically recognized the importance of procedures under the National Environmental Policy Act for identifying and addressing environmental justice concerns.

The memorandum 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 population and ethnicity for each county varies. The ethnicity of Catron County is predominately white (83 percent). Both Greenlee County and Grant County have a fairly equal population percentage of Hispanic or Latino and white; 46 percent and 48 percent and 50 percent and 47 percent, respectively. Other ethnic groups make up less than 4 percent of the population of any county.

Implementation of either of the alternatives evaluated in this environmental assessment would not result in disproportionate adverse impacts to minority and low-income populations.

Air Quality

Affected Environment

Air quality across is currently impacted by emission-generating smelters established south, southwest, and west of the project area and coal-fired power plants located quite a distance upwind of the project area. The Gila Wilderness Area Class 1 airshed is certified for visibility impairment due to regional haze.

The Apache-Sitgreaves and Gila National Forests management activities do not appreciably contribute to the increase of pollutants identified by EPA, except for particulate matter. The primary source of particulate matter from the national forests comes from roads and fugitive dust and emissions from smoke, contributing to regional haze.

Environmental Consequences

Dust generated from livestock grazing and grazing management is minimal and transient in nature, occurring primarily during movement or trailing of groups of cattle. There are no

measurable direct or indirect impacts to air quality expected from implementation of any of the alternatives.

Cumulative Effects

Cumulative effects is about how our actions combine with others. Possible impacts of dust generated from the movement of cattle, even in groups, is very minor and localized and would not be expected to result in cumulative effects when combined with other projects that may affect air quality.

Industries and human presence (recreational use) would continue to affect the airsheds in the analysis area similarly to current conditions under each alternative. The effects under the control of the Forest Service would not be significant and would be within Arizona Department of Environmental Quality and New Mexico Environment Department standards. Individually and cumulatively, implementation of any of the alternatives would not have a measurable effect on air quality.

Agencies and Persons Consulted

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

Federal and State Officials

U.S. Senate – Office of Jeff Flake

U.S. Senate – Office of John McCain

U.S. Senate – Office of Martin Heinrich

U.S. Senate – Office of Tom Udall

U.S. House of Representatives – Office of Tom O'Halleran

U.S. House of Representatives – Office of Steven Pearce

Arizona Senate – Office of Gail Griffin

Arizona House of Representatives - Office of John Drew

Arizona House of Representatives – Office of Becky Nutt

Arizona Governor's Office – Office of Doug Ducey

New Mexico Senate – Office of Howie Morales

New Mexico House of Representatives – Office of Rebecca Dow

New Mexico House of Representatives – Office of Gail Armstrong

Federal Agencies

Bureau of Land Management – Arizona

Bureau of Land Management – New Mexico

Bureau of Reclamation

Natural Resource Conservation Service – Arizona

Natural Resource Conservation Service –New Mexico

USDA – APHIS Wildlife Services

U.S. Fish and Wildlife Service, Arizona Ecological Services office

U.S. Fish and Wildlife Service, New Mexico Ecological Services office

Tribes

Alamo Navajo Chapter

Fort McDowell Yavapai Nation

Fort Sill Apache Tribe

Hopi Tribe

Hualapai Tribe

Mescalero Apache Nation

Navajo Nation

Pueblo of Acoma

Pueblo of Zuni

Pueblo of Laguna

San Carlos Apache Tribe

Tonto Apache Tribe

White Mountain Apache Tribe

Yavapai-Apache Nation

Yavapai-Prescott Tribe

Ysleta Del Sur Pueblo

State Agencies

Arizona Department of Environmental Quality

Arizona Department of Water Resources

Arizona Game and Fish Department

Arizona Geological Survey

Arizona State Historic Preservation Office

Arizona State Parks

Arizona State Forestry

Arizona State Land Department

Arizona Department of Transportation

New Mexico Department of Agriculture

New Mexico Department of Game and Fish

New Mexico Economic Development Division

New Mexico Environment Department – Water Resources and Management

New Mexico Office of the State Engineer

New Mexico State Historic Preservation Office

Both national forests consulted with their respective State Historic Preservation Offices. The Gila received concurrences from the New Mexico State Historic Preservation Office in June, 2018 and the Apache-Sitgreaves received concurrence from the Arizona State Historic Preservation Office on March 29, 2019.

Others

Apache County

Catron County

Coconino County

Gila County

Grant County

Greenlee County

Navajo County

City of Duncan

Town of Clifton

Town of Pinetop-Lakeside

Eastern Arizona Counties Organization

Grant Soil and Water Conservation District

San Francisco Soil and Water Conservation District

Arizona State University

New Mexico State University Range Improvement Task Force

Norther Arizona University

Norther Pioneer Community College

University of Arizona

University of Arizona Cooperative Extension

Mailing lists disclosing other nongovernmental organizations, businesses, entities, and persons consulted with are available in the project record.

References

Executive Order 11988. 1977. Floodplain management. 42 FR 26951, 3 CFR, May 24, 1977. https://www.archives.gov/federal-register/codification/executive-order/11988.html

Executive Order 11990. 1977. Protection of wetlands. 42 FR 26961, 3CFR, May 24, 1977. https://www.archives.gov/federal-register/codification/executive-order/11990.html

Executive Order 12898. 1994. Federal actions to address environmental justice in minority populations and low-income populations. Federal Register volume 59, number 32. https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf.

Executive Order 13443. 2007. Facilitation of hunting heritage and wildlife conservation. Federal Register: 72 FR 46537. August 20, 2007. http://www.gpo.gov/fdsys/pkg/FR-2007-08-20/pdf/07-4115.pdf.

36 CFR Part 222, Subpart A – Grazing and livestock use on the National Forest System. Revised July 1, 2012.

40 CFR Part 1508, section 1508.7 and section 1508.8. 2005. Regulations for implementing the procedural provision of the National Environmental Policy Act.

Arizona Desert Wilderness Act of 1990. Appendix A - Grazing Guidelines. H.R. 101-405 to accompany H.R. 2570. PL 101-628; Section 101. 1990.

Arizona Native Plant Society (AZNPS). 2000. Arizona rare plant guide. Available online at http://www.aznps.com/rareplants.php Accessed 4/27/18

Biota Information System of New Mexico. 2014. Accessed April 2, 2014. BISON-M home page. http://www.bison-m.org

Brennan, J. 2008. Species and biodiversity responses to climate change. Climate change impacts on natural resource management in the Columbia Basin workshop – June 24/25, 2008, Boise, Idaho. Senior Climate Change Scientist - Defenders of Wildlife. Available online at http://www.fws.gov/pacific/Climatechange/pdf/boise/Brennan/PDF%20of%20Powerpoint/JeanBrennan_08=06-24%20-Boise.pdf

Brown, Carol. 2008. Climate change and site-specific range allotment analysis. White Paper-November 24, 2008. Sawtooth National Forest, Twin Falls, Idaho.

Briske, D.D., L.A. Joyce, H.W. Polley, J.R. Brown, K. Wolter, J.A. Morgan, B.A. McCarl, and D.W. Bailey. 2015. Climate-change adaptation on rangelands: linking regional exposure with diverse adaptive capacity. Frontiers in Ecology and the Environment 13: 249–256. doi:10.1890/140266

Cooperative Extension Service, USDA Forest Service, Natural Resources Conservation Service, and USDI Bureau of Land Management. 1996, revised 1999. Utilization studies and residual measurements. Interagency Technical Reference 1734-3.

Cooperative Extension Service, USDA Forest Service, Natural Resources Conservation Service; and USDI Bureau of Land Management. 1996, revised 1999. Sampling vegetation attributes. Interagency Technical Reference 1734-4.

Cosgrove, C.R. Economic impacts of Apache-Sitgreaves National Forests public land ranching, final report – January 1998. 12 pages.

Environmental Protection Agency (EPA). 2007. Ruminant livestock frequent questions.

Hawkes, J.M. and J.D. Libbin. 2007. Range livestock costs and returns for New Mexico, 2002. Range Improvement Task Force report 75. New Mexico State University Library digital collections. http://contentdm.nmsu.edu/cdm/ref/collection/AgCircs/id/74709

Holechek, J.L., D. Galt, J. Joseph, J. Navarro, G. Kumalo, F. Molinar, and M. Thomas. 2003. Moderate and light cattle grazing effects on Chihuahuan desert rangelands. J. Range Manage. 56(2): 133-139

Holechek, J.L., R.D. Pieper, and C.H. Herbel, 2004. Range management, principles, and practices. Fifth Ed. Pearson Prentice-Hall, Inc. Upper Saddle River, New Jersey 07458.

Karl, T.R., J.M. Melillo, and T.C. Peterson (eds). 2009. Global climate change impacts in the United States. Cambridge University Press.

Loeser, M.R.R., T.D. Sisk, and T.E. Crews. 2007. Impact of grazing intensity during drought in an Arizona Grassland. Conservation Biology 21(1):87-97.

Milchunas, D.G. and W.K. Lauenroth 1993. Quantitative effects of grazing on vegetation and soils over a global range of environments. Ecological Monographs 63(4): 327-366

Molinar, F., J. Navarro, J. Holecheck, D. Galt, and M. Thomas. 2011. Long-term vegetation trends on grazed and ungrazed Chihuahuan desert rangelands. J. Rangeland Ecol Manage 64: 104-108

NatureServe. 2017. NatureServe Explorer: An online encyclopedia of life [web application]. NatureServe, Arlington Virginia. Available http://www.natureserve.org/explorer.

New Mexico Rare Plant Technical Council. 1999 (last update: August 14, 2008). New Mexico rare plants. Albuquerque, N.M. New Mexico Rare Plants Home Page. http://nmrareplants.unm.edu

Roth, D. 2016. Wildfire impacts on species of concern plants in the Gila National Forest, New Mexico. Prepared for the U. S. Fish and Wildlife Service, region 2, Albuquerque, NM.

Ruyle, G. and J. Dyess. 2010. Rangeland monitoring and the Parker 3-step method: overview, perspectives and current applications. Arizona Cooperative Extension. AZ1525

Smith, L., G. Ruyle, J. Maynard, S. Barker, W. Meyer, D. Stewart, B. Coulloudon, S. Williams, and J. Dyess. 2007. Principles of obtaining and interpreting utilization data on rangelands; AZ 1375. University of Arizona, College of Agricultural and Life Sciences, Arizona Cooperative Extension, Tucson, Arizona.

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

Sredl, M.J., and L.S. Saylor. 1998. Conservation and management zones and the role of earthen cattle tanks in conserving Arizona leopard frogs on large landscapes. In Proceedings of Symposium on Environmental, Economic, and Legal Issues Related to Rangeland Water Developments, pp. 211–225. Tempe, AZ.

United States Congress. 1995. Rescissions Act of 1995. Public Law 104-19, Section 504. Available online at https://www.congress.gov/104/plaws/publ19/PLAW-104publ19.pdf

USDA Forest Service. 1989. Riparian area survey and evaluation system (RASES). Southwestern Region. Albuquerque, NM.

USDA Forest Service. 2001. Pleasant Valley Allotment Management Plan Decision Notice and Fining of No Significant Impact. Dec. 6, 2001. Clifton Ranger District. Duncan, Arizona.

USDA Forest Service. 2003. Stream inventory handbook. Level I and II. Southwestern Region. Albuquerque, NM.

USDA Forest Service. 2004. Forest Service Manual 2520-Watershed Protection and Management.

USDA Forest Service. 2005. Forest Service Manual 2240 – Range Improvements.

USDA Forest Service. 2007. Appendix H of the first amended programmatic agreement regarding historic property protection and responsibilities Among New Mexico Historic Preservation Officer and Arizona State Historic Preservation Officer and Texas State Historic Preservation Officer and Oklahoma State Historic Preservation Officer and The Advisory Council On Historic Preservation and United States Department Of Agriculture Forest Service Region 3. Southwest Region. Albuquerque, NM

USDA Forest Service. 2013. Rangeland analysis and management training guide. Southwestern Region. Albuquerque, New Mexico.

USDA Forest Service. 2011. FS-978. Watershed condition classification technical guide. Washington D.C.

USDA Forest Service. 2015. R3 Supplement Forest Service Handbook 2209.13-Grazing permit administration handbook. Chapter 10 – Permits With Term Status. Southwestern Region, Albuquerque, New Mexico.

USDA Forest Service. 2016. R3 Supplement Forest Service Handbook 2209.13-Grazing permit administration handbook. Chapter 90 – Rangeland management decision making. Southwestern Region, Albuquerque, New Mexico.

USDA Forest Service. 2017. Guidelines for weed-free seed, forage, mulch, and fill materials in Region 3. USDA Forest Service. Southwestern Region. Revised 02/2017.

USDI Bureau of Land Management. 2015. Riparian area management: proper functioning condition assessment for lotic areas. Technical Reference 1737-15., National Operations Center. Denver, CO.

U.S. Fish and Wildlife Service. 2002. Southwestern willow flycatcher (*Empidonax traillii extimus*) recovery plan. Albuquerque, New Mexico. 210 pp., Appendices A-O.

U.S. Fish and Wildlife Service. 2007. Chiricahua leopard frog (*Rana chiricahuensis*) recovery plan. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, NM. 149 pp. + Appendices A-M.

U.S. Fish and Wildlife Service. 2012. Final recovery plan for the Mexican spotted owl (*Strix occidentalis lucida*), first revision. U.S. Fish and Wildlife Service. Albuquerque, New Mexico, USA. 413 pp.

U.S. Fish and Wildlife Service. 2016. Biological opinion: Hickey allotment management plan (02EAAZ00-2015-F-0512). Arizona Ecological Services Office. Phoenix, Arizona.

Widmar, D. 2018. Where's the meat? U.S. meat consumption continues higher. Agricultural economic insights. https://aei.ag/2018/02/19/wheres-meat-u-s-meat-consumption-continues-higher/