

Canelo Hills Allotments

Environmental Assessment



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1. Introduction

We are proposing to authorize continued livestock grazing on the Crittenden, Kunde, Mowry, Papago, and O'Donnell allotments on National Forest System lands on 39,048 acres of the Sierra Vista Ranger District of the Coronado National Forest.

We prepared this environmental assessment to determine whether effects of the proposed activities may be significant enough to prepare an environmental impact statement. By preparing this environmental assessment, we are fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. For more details of the proposed action, see the "Proposed Action and Alternatives" section of this document.

1.1. Background

The Crittenden Allotment is located on the west side of the Canelo Hills. It contains approximately 12,920 acres, of which 10,660 acres are capable of supporting livestock grazing. Elevations range from 4,200 feet in Redrock Canyon to 5,681 feet at the top of Mt. Hughes. Vegetation is predominantly broadleaf woodland and desert grassland with smaller acreages of chaparral and deciduous and evergreen riparian woodland. Currently the Crittenden Allotment is run as a community allotment, meaning that two grazing permittees run permitted livestock on it: one on the northern portion and one on the southern portion.

The Kunde Allotment is located in the southwestern portion of the Canelo Hills. It contains approximately 6,044 acres, of which 4,865 acres are capable of supporting livestock grazing. Elevations range from approximately 4,400 feet in Redrock Canyon to 5,700 feet in the Upper Lampshire Pasture. Vegetation is broadleaf woodland and desert grassland with some deciduous and evergreen riparian woodland in the Redrock Pasture.

The Mowry Allotment is located on the west side of the San Rafael Valley along Mowry Wash. It contains only 418 acres, all of which are capable for livestock grazing. The Mowry Allotment is considered to be an on/off allotment, meaning that Forest Service administered lands (159 acres) and privately owned lands (259 acres) collectively make a single grazing unit due to their adjacency. The Mowry Allotment was historically referred to as the Buyer Pasture and was permitted under a Special Uses Permit. According to direction provided in Forest Service Manual (FSM) 2722.15, the Special Uses Permit was to be converted to a Term Grazing Permit with on/off provision. Vegetation on the Allotment is broadleaf and evergreen woodland and desert and plains grasslands.

The O'Donnell Allotment is located on the east side of the Canelo Hills and just southwest of Canelo, AZ. It consists of 7,225 acres, of which 6,778 acres are capable for livestock grazing. Elevations on the Allotment range from approximately 5,200 to 6,000 feet. Topography consists of several northeast – southwest ridges separated by Pauline, Middle, and Western Canyons. Vegetation is comprised mostly of broadleaf and evergreen woodland and desert and plains grasslands. Canyon bottoms have some deciduous and evergreen riparian woodlands as well.

The Papago Allotment is located in the northern portion of the Canelo Hills. It consists of approximately 12,700 acres, of which 12,683 acres are considered capable for livestock grazing. Elevations range from about 4,900 feet in O'Donnell and Lampshire Canyons to 5,900 feet in the

Canelo Hills. The vegetation type is oak and evergreen woodland and desert and plains grasslands. Several pastures that fall within close proximity to the towns of Elgin and Sonoita are becoming infested with an old world non-native grass species: yellow bluestem.

1.2. Location of the Proposed Project Area

The project area is located in portions of T21S R16E and R17E; T22S R16E, R17E, & R18E; T23S R16E & R17E. The project area is situated entirely within Santa Cruz County, Arizona. Furthermore, all of the allotments are within the Huachuca Ecosystem Management Area (EMA), Sierra Vista Ranger District, Coronado National Forest.

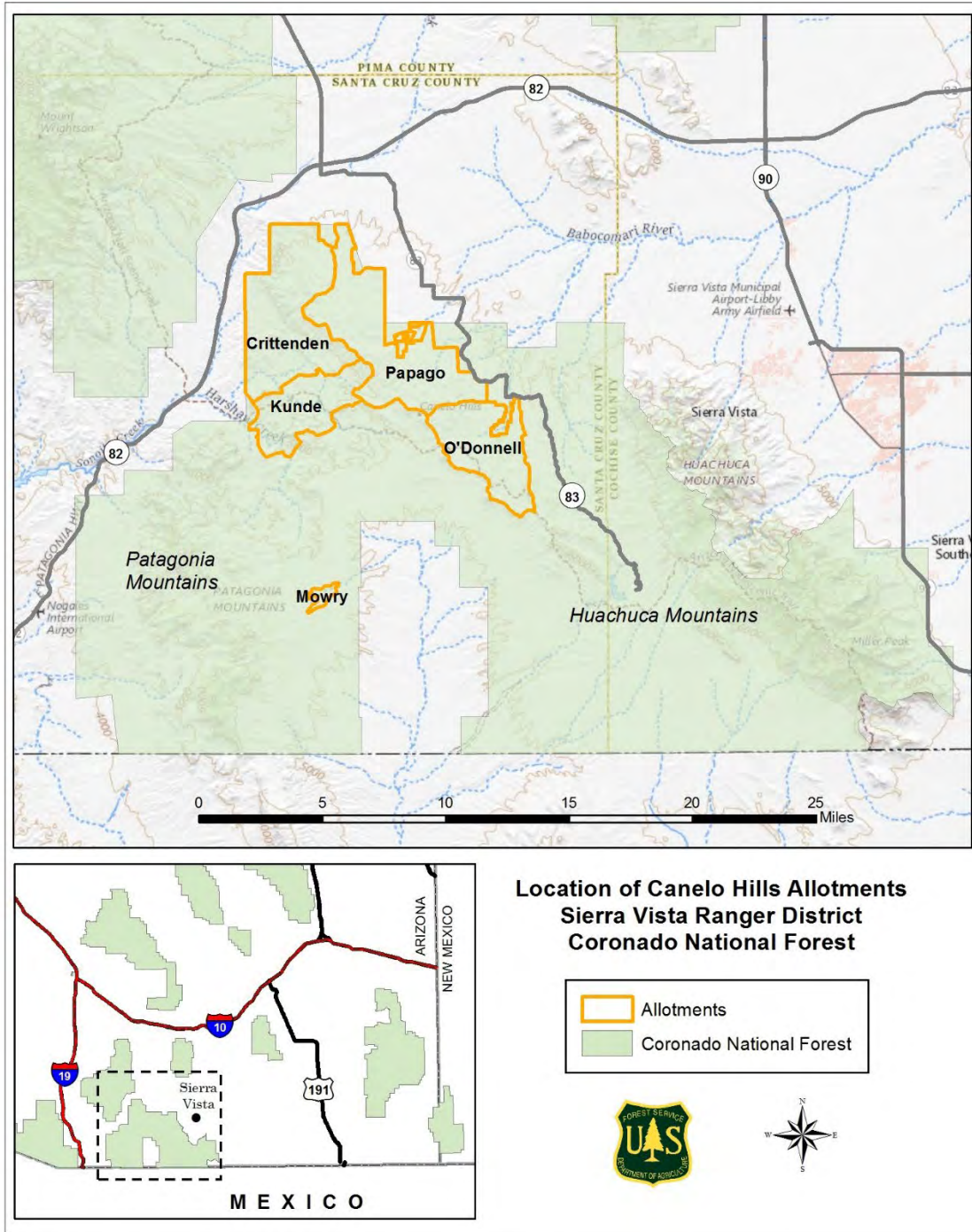


Figure 1. Project vicinity map

2. Need for the Proposal

The Crittenden, Kunde, Mowry, Papago, and O'Donnell grazing allotments (collectively referred to as the Canelo Hills allotments) include land identified as suitable for grazing in the Coronado National Forest Land and Resource Management Plan (Forest Plan). All of these allotments are

currently authorized for livestock grazing and have been authorized for many years. The environmental impacts analysis of the grazing authorizations has been completed in compliance with the requirements of NEPA and Section 504 of the Rescission Act of 1995 (P.L. 104, 1995).

The purpose and need is to reauthorize livestock grazing in a manner that would maintain current resource conditions where allotment conditions are satisfactory, and moves resource conditions towards meeting Forest Plan objectives and desired on-the-ground conditions where allotment conditions are unsatisfactory. The purpose of the project is to maintain or move toward desired conditions based on the specific need statements identified below.

From the purpose, several needs arose:

- There is a need to formally incorporate additional flexibility into the management of the allotments to allow the Forest Service and individual grazing permit holders to adapt management to changing resource conditions or management objectives, and to comply with Forest Service Policy (FSH 2209.13 Chapter 90).
- There is a need to achieve better livestock distribution to maintain and/or improve resource conditions. Rangeland vegetation condition is less than desirable in some areas as a result of poor distribution and low pasture reliability.
- There is a need for additional waters to improve distribution and increase the reliability of the allotments and improve vegetation conditions. These facilities would aid in providing better distribution across the entire allotment and provide for reliability of allotment use each year.

To address the purpose and need, a Forest Service interdisciplinary team developed proposed actions for each allotment based on a comparison of existing resource conditions in the project area with desired conditions identified in the Forest Plan and through site-specific evaluation of the project area resources. For more details of the proposed action, see the “Proposed Action and Alternatives” section of this document.

2.1. Forest Plan Consistency

The Forest Plan provides guidance for the management of multiple-use activities that occur within the Coronado National Forest. There are objectives, standards, guidelines, and management area direction, relevant to the project, found within the plan beginning on page 90 (Range Management), as well as statements related to the desired conditions for various resources such as vegetation, watersheds, riparian areas, soils, and wildlife. Plan components specific to the project area are located in Chapter 4: Geographic Areas, under the Sierra Vista Ranger District, Huachuca (EMA).

Grazing is one of the many uses allowed on the Forest. Forest Service policy is to make forage available to qualified livestock operators from lands suitable for grazing, provided it is consistent with the Forest Plan and meets the terms of the administrative permit. The project area was determined as suitable and capable for grazing. The Forest Plan and related documents can be found at: <https://www.fs.usda.gov/main/coronado/landmanagement/planning>.

2.2. Existing Condition and Management

Recent Management. The Canelo Hills have been used for grazing since the 1800s. Recent livestock use is shown in Table 1. Current management on each allotment is described below.

The Crittenden allotment is a community allotment, meaning that two permittees graze different portions of the allotment at the same time; the allotment is divided between the two permittees into the southern portion and the northern portion. The southern portion is currently permitted for 165 cow/calf pairs year-long (1,980 AUMs) and consists of the following pastures: Corral Canyon, Red Bear, Oak Grove, Moonshine, East Red Rock, and West Rock. The East and West Red Rock Pastures are considered Riparian pastures and are only grazed by livestock for 30 days each during the dormant season (November – April). This measure was put into place to protect Gila topminnow habitat and this management practice will go unchanged into the future. The northern portion is currently permitted for 50 cow/calf pairs year-long (600 AUMs) and consists of the following pastures: Dark Canyon, 3-C, and Alamo Holding. The allotment is operated as a community allotment because it has proven difficult to move livestock over a large ridge that runs from the northwest to the southeast across the allotment. Both portions of the allotment are managed under a rest-rotation system.

The Kunde allotment is currently permitted 66 cow/calf pairs yearlong (792 AUMs). The allotment is managed under a six pasture rest-rotation system. In 2004 a NEPA decision was signed that removed livestock grazing from the Red Rock pasture, effectively reducing the permitted number by 22 cow/calf pairs year round. This decision was made to reduce the impacts to the Gila topminnow and to improve riparian and watershed conditions in Red Rock Canyon. Currently, all perennial stream flow within Red Rock Canyon is fenced to exclude livestock grazing. The Gate Spring Enclosure is at the east end of the Red Rock pasture and the Falls Enclosure is at the west end. Gila topminnow were once found in all perennial riparian habitat within Red Rock Canyon but began to decline in 2001. The species has not been detected since 2005. This decline was apparently caused by the combined effects of drought and the introduction of non-native mosquito fish.

The Mowry allotment is currently permitted for 8 cow/calf pairs yearlong. It contains only 418 acres, all of which are capable for livestock grazing. The Mowry Allotment is considered to be an on/off allotment, meaning that Forest Service administered lands (159 acres) and privately owned lands (259 acres) collectively make a single grazing unit due to their adjacency. The Mowry Allotment was historically referred to as the Buyer Pasture and was permitted under a Special Uses Permit for many years. According to direction provided in Forest Service Manual (FSM) 2722.15, the Special Uses Permit was to be converted to a Term Grazing Permit with on/off provisions. The Mowry Allotment is authorized a temporary increase in accordance with FSH 2209.13, Chapter 10 for 21 cow/calf pairs. We are proposing to authorize 8 – 25 cow/calf pairs year-long (127 – 396 AUMs). This proposed range of livestock numbers is based off of historical stocking records when the allotment was managed under a Special Use Permit as well as the current stock and monitor plan. The Mowry Allotment has three pastures and is managed under a rest-rotation system.

The capacity on the Papago Allotment was reduced in 2002 from 400 cow/calf pairs to 250 cow/calf pairs yearlong (3,000 AUMs). During the same time the Ryan Fire burned a large portion of the allotment requiring rest for proper recovery. The permit holder at the time took the opportunity to implement a number of planned improvements such as cross fencing of existing pastures and extensive pipelines across the allotment. The resulting recovery conditions from the fire and the new improvements provided enough management flexibility to only use one half of

the entire allotment each year with 250 head. This excess forage prompted the district to authorize a temporary increase of cattle over a 3 year period in accordance with FSH 2209.13, Chapter 10 to conduct capacity studies with the new infrastructure in place. The results of this study showed the allotment could conservatively run 400 cow/calf pairs yearlong. Upon completion of the study the ranch reduced the herd back to 250 head until it picked up the neighboring O'Donnell allotment in 2014 and under an adaptive management strategy, has run a two-herd grazing system on the two adjacent allotments. This allows for the permittee to run a greater number of livestock than permitted for a shorter time duration while staying below the allowable AUMs. Overall, the O'Donnell Allotment is permitted for 120 cow/calf pairs yearlong (1440 AUMs) and the Papago Allotment is currently permitted for 250 cow/calf pairs yearlong (3,000 AUMs) The Papago Allotment has 17 pastures and the O'Donnell Allotment has six pastures and both are managed under a rest-rotation system.

Table 1. Allotment size, permitted head and season of use (use shown in Animal Unit Months)

	Crittenden	Kunde	Mowry	O'Donnell	Papago
Total Acres	12920	6044	418	7225	12700
Capable Acres	10660	4865	418	6778	12683
Permitted Use	215 Cow/Calf	66 Cow/Calf	8 Cow/Calf	120 Cow/Calf	250 Cow/Calf
Grazing Season	03/01 – 02/28	03/01 – 02/28	03/01 – 02/28	03/01 – 02/28	03/01 – 02/28
Permitted Use: Animal Unit Months ¹	2580	792	96	1440	3000
Actual Use (By Grazing Year)(AUMs)					
2009	2580	420	300	1440	4200
2010	2580	432	300	1200	4009
2011	2580	516	300	1200	2957
2012	2580	564	300	1200	3007
2013	2580	792	300	1320	2755
2014	2580	792	96	1059	2710
2015	2580	792	96	1419	2145
2016	2580	792	96	667	2878
2017	1938*	792	96	887	2971
2018	1524*	792	252 ²	1440	2507
2019	1730	792	252	1406	2716
2020	1395	792	252	1124	2705

¹ An animal unit month (AUM) is a measure of the amount of *forage* required by a 1000 lb. cow or its equivalent for one month based on a daily allowance of 26 lbs. of dry forage per day (Society for Range Management 1998, USFS 1997). It is not synonymous with animal month (or head-month), which is an expression of one month's *occupancy* of the range by an animal. Forage production can be variable and stocking is determined on an annual basis in response to actual use monitoring.

² The Mowry Allotment was authorized a temporary increase in accordance with FSH 2209.13, Chapter 10 for 21 cow/calf pairs. Utilization data is currently being obtained. The range conditions on the allotment support the proposed range of numbers.

*The southern portion of the Crittenden Allotment received less than average summer precipitation in 2017 and 2018, therefore livestock numbers were reduced accordingly.

3. Proposed Action and Alternatives

3.1. Proposed Action

The proposed action incorporates an adaptive management strategy to provide sufficient flexibility to adapt management to changing circumstances. If monitoring indicates that desired conditions are not being achieved, management would be modified in cooperation with the permittees using the Annual Operating Instructions. Changes may include administrative decisions, such as the specific number of livestock authorized annually, specific dates for grazing, class of animal or modifications in pasture rotations, but such changes would not exceed the limits for timing, intensity, duration and frequency defined for the proposed action.

The proposed action for the **Crittenden, Kunde, Mowry, Papago and O'Donnell allotments** consists of four components – **authorization, improvements, management practices/design features and monitoring** – implemented using an adaptive management strategy as defined in FSH 2209.13, Chapter 90.

3.1.1. Authorization

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

- **Permit Issuance.** A new 10-year term grazing permit would be issued for the allotments in accordance with Forest Service policy (FSM 2231.03) for the numbers and terms displayed below. The term grazing permits would identify the number, kind and class of livestock authorized and the season of use as required by Forest Service policy (FSM 2231.11). The permit would also identify the total animal unit months (AUMs) authorized for each permit as illustrated in Table 2 below. The number and class of livestock and the season of use would be allowed to vary in response to resource conditions and management objectives. Resource conditions that would affect management decisions may include but not be limited to precipitation, forage production, water availability and previous annual or seasonal utilization levels. On all allotments (with the exception of Papago and Mowry), the current permitted number is in balance with carrying capacity. The Papago allotment has already been shown to carry the proposed increase in livestock with existing infrastructure and forage and the Mowry allotment is currently showing that it can support the proposed range in numbers. All proposed permitted numbers will be a range. Annual use will not exceed the total AUMs authorized or the season of use identified in the permit. Changes would be documented and authorized annually in the annual operating plans. The grazing permit would be issued within 90 days of final agency action following the NEPA decision to authorize grazing [FSH 2209.13(94) and R3 Supplement 2209.13-2016-1].
 - **Crittenden:** Issue 2 permits authorizing a total of 162 - 215 cow/calf pairs year-long, or 2,580 AUMs. The southern portion of the allotment would be authorized for 148 - 165 cow/calf pairs year-long (1,776 - 1,980 AUMs) and consists of the following pastures: Corral Canyon, Red Bear, Oak Grove, Moonshine, East Red Rock, and West Rock. The East and West Red Rock Pastures are considered Riparian pastures and will only grazed by livestock for 30 days each during the

dormant season (November – April). The northern portion would be authorized for 40 - 50 cow/calf pairs year-long (480 - 600 AUMs) and consists of the following pastures: Dark Canyon, 3-C, and Alamo Holding.

- **Kunde:** Authorize 66 – 88 cow/calf pairs year-long (792 – 1,056 AUMs). This increase from the current 66 cow/calf pairs year-long is in response to the proposal for the Red Rock pasture to be re-entered into the grazing rotation. This pasture will be used during the dormant season (November – April). The addition of this pasture will allow for the equivalent of 22 cow/calf pairs to be added to the permit. All perennial stream flow within Red Rock Canyon will remain fenced to exclude livestock grazing.
- **Mowry:** Authorize 8 – 25 cow/calf pairs year-long (127 – 396 AUMs). This increase from the current 8 cow/calf pairs year-long is based off of historical stocking records when the allotment was managed under a Special Use Permit and annual monitoring that indicates additional capacity is present on the allotment.
- **Papago and O’Donnell:** Combine the Papago and O’Donnell allotments into one single allotment. Currently, the two adjacent allotments are permitted to the same grazing permittee. This action would help to increase flexibility in management. The newly combined allotment would be authorized for 390 - 520 cow/calf pairs year-long (4,680 – 6,240 AUMs). The proposed capacity is based on 400 cow/calf pairs year-long (4,800 AUMs) on the Papago Allotment, which is an increase from the currently permitted 250 cow/calf pairs, and 120 cow/calf pairs year-long (1,440 AUMs). This overall increase is based off of data gathered from an experimental increase and subsequent production-utilization study, as well as range improvements that have been implemented by the current permittee on the Papago allotment.

Table 2. Proposed permitted numbers and grazing management

Allotment	Management System	Animal Unit Months (AUMs)	Cattle Numbers – Season
Crittenden	9 Pasture - Rest Rotation	1,944 – 2,580	162-215 cow/calf – 03/01-02/28
Kunde	7 Pasture - Rest Rotation	792 – 1,056	66-88 cow/calf – 03/01-02/28
Mowry	3 Pasture - Rest Rotation	127 - 396	8-25 cow/calf – 03/01-02/28
Papago and O’Donnell*	23 Pasture - Rest Rotation	4,680 – 6,240	390-520 cow/calf – 03/01-02/28

* These two allotments are proposed to be combined into one allotment.

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

plans³ (CRMPs) will be encouraged where the coordinated use of intermingled private, state and federal lands is conducive to more effective management.

- **Annual Operating Instructions.** On an annual basis, the District and permittee would continue to meet and jointly prepare Annual Operating Instructions (AOI) prior to each grazing year to set forth (FSH 2209.13):
 - The maximum permissible grazing use authorized on the allotment for the current grazing season and the numbers, class, type of livestock, and timing and duration of use.
 - The planned sequence of grazing on the allotment, or the management prescriptions and monitoring that would be used to make changes.
 - Structural and non-structural improvements to be constructed, reconstructed, or maintained and who is responsible for these activities.
 - Allowable use or other standards to be applied and followed by the permittee to properly manage livestock.
 - Monitoring for the current season that may include, among other things, documentation demonstrating compliance with the terms and conditions in the grazing permit and AMP.

3.1.2. Improvements

The lack of reliable water has been the limiting factor on all of the allotments for many years. Water distribution was addressed across all of these allotments in their respective past analyses, however through subsequent monitoring and planning with the permit holders, additional improvements are proposed to provide more tools for better management to achieve desired conditions. These improvements have been proposed in the context of adaptive management, meaning that they have been identified as possible practices to assist in the achievement of desired conditions if management alone is not sufficient. Specifically, the proposed water developments and fences would increase livestock distribution to achieve desired conditions and further benefit vegetation and soil conditions across the allotments in this analysis. Future monitoring may indicate that some of the projects are not necessary or feasible, in which case they would not be constructed. Current levels of Forest Service funding are unlikely to be sufficient to fund all projects identified. The permittees may need to pursue outside sources of funding or bear a larger portion of the costs in order to complete all projects. Proposed improvements in each allotment are described below and estimated in Figures 2-6 in Appendix A.

Maintenance of existing improvements will continue as needed. The responsibility for maintenance of range improvements is assigned to the permittee(s) in the terms and conditions of each grazing permit (FSM 2244.03). On an annual basis, responsibilities for repair and maintenance of existing improvements will be identified in the AOIs.

³ Coordinated resource management is the process by which various users and agencies cooperate to manage a variety of resources across multiple jurisdictional boundaries, which allows for landscape-level management and involvement of a variety of stakeholders.

Crittenden Allotment

- Extend/bury a pipeline from the Red Rock Well and place a water source on the fence line between the East and West Red Rock pastures.
- Extend/bury a pipeline from the Red Rock Well and place an additional water source on the east side of the Oak Grove pasture.
- Extend/bury a pipeline and place an additional water source on the west side of the Oak Grove pasture.
- Extend/bury a pipeline from the Corral Canyon pipeline to the west central side of the Corral Canyon pasture to provide an additional water source.
- Extend/bury two pipelines from the Corral Canyon pipeline to create two additional upland waters in the Red Bear pasture.
- Cross fence the Dark Canyon pasture in a NE to SW direction.
- Extend/bury a pipeline from the Alamo pipeline to create a permanent upland water source in the SE corner of Section 2 and at Monkey Tank.
- Extend/bury a pipeline from the Alamo pipeline to create a permanent water source at Hidden Tank.
- Cross fence the 3-C pasture to the East of Monkey Tank.
- Replace/bury existing pipelines as needed.

Kunde Allotment

- Extend/bury pipeline from the East Well into the west side of the Red Rock pasture.
- Outfit the Red Rock well with a solar pumping station to provide a water source in the northeast side of the Red Rock pasture.
- Extend/bury a pipeline from the Kunde Headquarters, or the Red Rock Well (depending on reliability), to create an upland water source on the south side of the Red Rock pasture.
- Establish upland waters from the Kunde Headquarters, or the Red Rock Well (depending on reliability), that would deliver reliable water to the Red Rock, Holding, and Upper and Lower Lampshire pastures. Installing 5 storages (5,000 gallons each), approximately 5 miles of buried pipeline, and 6 troughs.
- Extend/bury a pipeline from the Sorrels pipeline to provide an additional water source on the west side of the Sorrels pasture.
- Extend/bury a pipeline from the Bat Cave pipeline to the Bat Cave Tank to provide year-round water.
- Extend/bury a pipeline from the East Well to provide an additional water source in the Turner and Home pastures.
- Fence Homestead Spring and adjacent floodplain if monitoring indicates the need.

Mowry Allotment

- Install/bury a pipeline and install a water trough and storage tank in the South pasture. The source would either come as an extension off of an existing pipeline from the neighboring allotment to the west, or from the ranch headquarters to the northeast.

Papago and O'Donnell Allotments

- Cross fence the La Falda pasture through the Little Maloney Tank on the Papago allotment and construct a water lot around the tank.
- Construct a corral in the Mack Wood pasture on the Papago allotment and provide water to the corral by extending/burying a pipeline from the existing pipeline to the south.
- Construct a water lot around O'Leary Tank on the Papago allotment so livestock can access the tank from four pastures: Cave, Cordon, and East and West Mountain.
- Extend the Papago Pipeline to the Park Stock Tank on the Papago allotment to provide year-round water.
- Place a new storage and trough at the end of the pipeline in the Middle pasture of the Papago allotment. The pipeline is already in place and originates at the North Well.
- Construct a corral at the junction of the Bull, West, and Canelo pastures on the O'Donnell allotment and provide water in the corral from an existing pipeline that is situated where the corral is proposed.
- Extend/bury a pipeline from the Western Well to the Fort Tank in the Farr pasture of the O'Donnell allotment.
- Enlarge the existing Western Corral in the Canelo pasture on the O'Donnell allotment to be able to utilize the corral as a shipping facility.
- Improve the Middle Canyon Corrals on the O'Donnell allotment.
- Extend/bury a pipeline from a well that is owned by the permittee on private land and place a storage and drinker in the Heifer and the Lower Pauline pastures of the O'Donnell allotment.

3.1.3. Management Practices and Design Features

To mitigate resource impacts, the following measures would be implemented on allotments where grazing is authorized. These measures have been demonstrated to be successful when used on similar projects and are considered effective at reducing environmental impacts. These features were developed in accordance with applicable Forest Plan standards and guidelines, Forest Service Manual and Handbook direction, as well as law and regulation. These design features may be modified or changed, or new measures may be added in response to public comments and the environmental analysis process.

- **Duration, timing and frequency of grazing.** Use on the **Crittenden, Kunde, Mowry, Papago and O'Donnell allotments** would be authorized year-round using rotational grazing. Grazing management would be designed to ensure that pastures receive periodic growing season rest or deferment in order to provide for grazed plant recovery. The sequence and timing of pasture moves will be based on monitoring of range readiness, ecological condition, forage and water availability and long-term utilization amounts and patterns.
- **Grazing intensity:** Grazing intensity, while combined with other forms of implementation and effectiveness monitoring (see monitoring section below), can help guide management decisions to meet desired conditions. Grazing intensity across the forest is described as forage utilization on key forage species. Forage utilization would be managed at a level corresponding to light to moderate intensity (30-45% annual utilization in key areas) to provide for grazed plant recovery, increased herbage production and retention of herbaceous litter to protect soils and provide forage and cover for wildlife (Holechek et al 2004). While utilization monitoring often occurs annually,

it's the long term view of that monitoring that guides management decisions. Reviews of stocking rate studies supports this practice as its recommended that grazing intensities guideline are target over 5-10 year periods to account for climatic variables (Holechek and Galt 2000). However, consistent patterns of annual utilization in excess of 45% of key species in key areas would be used as a basis to modify management practices or take administrative actions necessary to reduce utilization in subsequent grazing seasons.

The design features listed below provide resource protection measures to mitigate potential impacts of implementing the project. These features were developed in accordance with applicable Forest Plan standards and guidelines, Forest Service Manual and Handbook direction, as well as law and regulation. These design features may be modified or changed, or new measures may be added in response to public comments and the environmental analysis process.

Soil, Hydrology, Vegetation and Watershed – The objective is to mitigate effects of livestock grazing and facility construction through the use of Best Management Practices (FSH 2509.22 and National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1) and adaptive management. Practices include, but are not limited to the following.

- Utilization of key upland herbaceous forage species in key areas would be managed to achieve the goal of light to moderate grazing as a pasture average. The objective is to protect plant vigor, increase herbaceous residue needed for soil protection and to increase herbage producing ability of forage plants. A utilization guideline of up to 45% use of key species in key areas would be used to achieve this objective.
- Management practices would be used to achieve proper distribution or lessen the impact on sensitive areas. Practices include herding, salting and controlling access to waters. Salt would be placed away from roads and at least one quarter mile from waters. Placement of liquid or bulk supplements would require prior approval of the District Ranger.
- Use permit authorities to change operations to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources when special circumstances (e.g. drought) occur.
- Locate water source developments in such a manner as to avoid or minimize disturbance to riparian areas and streambanks, and erosion and sedimentation to the extent practicable.
- Utilize natural land contours where possible for the installation of buried pipeline to reduce slope of disturbed areas.
- Limit the size of the construction footprint (area of bare soil with reduced infiltration capacity) to the minimum necessary for efficient operations to the extent practicable.
- Apply soil protective cover on disturbed areas where natural revegetation is inadequate to prevent accelerated erosion before the next growing season.
- Limit operation of equipment on wet soils to minimize soil compaction, displacement, erosion, and sediment runoff.
- Stabilize steep, excavated slopes (through the use of water bars, soil cover, and/or seeding).

- Install appropriate signage or barriers (e.g. dead and downed trees) where necessary to prevent off-road travel along proposed pipeline routes.
- In areas where livestock numbers are being increased, soil condition monitoring will be conducted to ensure soil condition remains satisfactory. If monitoring indicates downward trends in soil condition, administrative actions will be taken to reverse this trend.
- Only dormant season grazing will be permitted for larger drainages with more consistent flow and predominant riparian vegetation, including Redrock Canyon and Harshaw Creek. These drainages will also be monitored for condition trends. If monitoring indicates declines in riparian vegetation condition, then administrative actions will be taken to reverse this trend.

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

- All water developments would include wildlife access and escape ramps and would be designed for improved access for all wildlife species. Waters would be kept available to wildlife year-round unless prior approval is given to shut waters off to control livestock use patterns.
- Follow the Stockpond Management Plan and work towards developing a local strategy for how stockponds will be used in livestock operations and the management of wildlife.
- Notify permit holders and Range Staff of the operational procedures in the Chiricahua leopard frog (CLF) and Sonoran tiger salamander (STS) Recovery Plans to minimize take from the introduction of non-native species and disease contamination.
- Construction or reconstruction of livestock fencing and replacement of non-permeable fencing where wildlife movement is restricted should be consistent with the appropriate state wildlife agency standards for safe passage of wildlife and/or species-specific fencing guidelines developed at the local or regional level.
- No human disturbance or construction actions associated with the livestock grazing will occur within 0.25 miles of Mexican spotted owl Protected Activity Centers (PACs) during the breeding season (March 1-August 31). Exceptions may occur where recent surveys indicate non-breeding or infer absence.
- If the construction or repair of range improvements may disturb breeding western yellow-billed cuckoo, then that activity will be avoided within the YBCU breeding season (June 1 – September 30).
- Avoid the removal of yucca or agave to conserve nectar sources for bats.
- Grazing management practices should be designed to maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological zone. Additionally, grazing management should retain ground cover sufficient for the forage and cover needs of native wildlife species.
- Within riparian areas, structures used to manage livestock should be located and used in a way that does not conflict with riparian functions and processes.
- Treatments for restoring rangelands should emphasize the use and perpetuation of native plant species.
- Grazing intensity, frequency, occurrence, and period should provide for growth and reproduction of desired plant species while maintaining or enhancing habitat for wildlife.

- Burned areas will be evaluated site specifically in accordance with the Regional Supplement to FSH 2209.13 – 2015-1, Section 19.2 Considerations for Re-Stocking and Management of Grazing Allotments Post Wildfire and Other Disturbances. The site-specific analysis will guide grazing management to ensure proper vegetation and soil recovery.
- Where possible, limit livestock access to aquatic sites occupied by CLF in order to minimize direct mortality and injury due to trampling, the destruction of bankline cover, and deterioration of water quality. Emphasize sites that play a major role in metapopulation dynamics and long-term population persistence.
- Through regular monitoring, the Forest will determine whether there is a need to specifically assess hydrologic function in Redrock Canyon. If watershed improvements are determined to be necessary, the Forest will coordinate with partners to facilitate the installation of check dams in the upper reaches of the watershed.
- Maintain existing exclosures designed to reduce livestock pressure on Gila topminnow habitat. While permitted livestock are grazing pastures bordering an exclosure, the Forest will ensure:
 - Exclosure fences are functional upon livestock entry to these pastures.
 - The Forest and/or the permit holder will check and repair these fences to ensure that no fence is non-functional for more than two weeks.
- The Forest will continue to commit personnel to coordinate with the Arizona Game and Fish Department, New Mexico Department of Game and Fish, and FWS to:
 - Attend stakeholder meetings.
 - Discuss translocating Chiricahua leopard frog to suitable sites on the Forest, emphasizing the enhancement of metapopulation dynamics and long-term population persistence.
 - Support and implement a robust program to control nonnative aquatic organisms on the Forest, particularly bullfrogs, fish in the families Centrarchidae and Ictaluridae, and crayfish.

Cultural Resources – The objective is to protect cultural resources (historic and archaeological sites and traditional cultural properties) from direct or indirect impacts caused by ground-disturbing activities associated with the construction of range facilities and to monitor the effects of cattle grazing on sites to ensure that adverse effects are not occurring. In general, these measures include the following:

- All new proposed range facilities will be surveyed by qualified personnel for cultural resources prior to any ground-disturbing activities. Facilities would be built or modified to avoid impacts to sites.
- If unrecorded cultural resources are discovered during the course of project implementation, activities would cease and the Forest or District Archeologist would be notified.
- Proposed facilities are located so as to avoid concentrations of livestock on identified cultural resource sites.
- No salting would occur within or adjacent to identified cultural resource sites.
- If impacts from grazing (e.g. excessive trampling, cattle rubbing against and knocking down standing features) are determined to be impacting cultural resource sites, measures would be taken (e.g. fencing) to protect them.

Invasive Weeds – The objective is to minimize the introduction and establishment of invasive weeds being established on National Forest System lands.

- Equipment would be cleaned prior to moving between units known to be infested with invasive plants and other units that are free of such plants.

3.1.4. Monitoring

The objective of monitoring is to determine whether management is being properly implemented and whether the actions are effective at achieving or moving toward desired conditions. The forest separates rangeland monitoring into the two categories: Effectiveness Monitoring and Implementation Monitoring. These two types of monitoring are needed to interpret effects of management on rangelands. As effectiveness monitoring provides the long-term trend and data associated with various attributes related to upland vegetation and riparian areas, the implementation monitoring helps evaluate the uses, actions, and/or stressors that took place on the same benchmark sites and the surrounding areas. Assumptions can be made by using the data from these two data sets to help determine why certain attributes in long term monitoring are or are not changing over time, and thus inform decision making in adaptive management.

Effectiveness monitoring includes measurements to track condition and trend of upland and riparian vegetation, soil, and watersheds. Monitoring will be done following procedures described in the interagency technical reference⁴ and the Region 3 Rangeland Analysis and Training Guide.⁵ This data is interpreted to determine whether management is achieving desired resource conditions, whether changes in resource condition are related to management, and to determine whether modifications in management are necessary. Effectiveness monitoring will occur at five to ten year intervals, or more frequently if deemed necessary. Examples of effectiveness monitoring measurements include, but are not limited to plant frequencies by species, relative plant compositions by species, point ground cover, riparian evaluations and transects (repeat photography, bank stability measurements, channel gradient and cross section mapping, vegetation cover by species, age class inventory by species and/or proper functioning condition assessments), soil and watershed condition assessments, plant community similarity index assessments, and repeat photography. Monitoring occurs at established permanent monitoring points.

Implementation monitoring will occur on an ongoing basis and will include, but not be limited to, such things as forage utilization measurements, livestock counts, and range improvement inspections. An allotment inspection will include all of the aforementioned attributes along with field observations such as cattle behavior and distribution description, grazing permit compliance checks, invasive species populations, soil and watershed conditions, recreation uses, wildlife observations, and general resource conditions.

Utilization measurements are made following procedures found in the Interagency Technical Reference⁶ and with consideration of the Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands (Smith et al 2016). Utilization will be monitored on key forage

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

⁵ Rangeland Analysis and Management Training Guide. 1997. USDA Forest Service, Southwestern Region.

⁶ Utilization Studies and Residual Measurements. Interagency Technical Reference. 1996. Cooperative Extension Service, USDA Forest Service and Natural Resources Conservation Service, and USDI Bureau of Land Management. Revised 1999.

species, which are perennial grasses that are palatable to livestock. At a minimum monitoring will include use in key areas⁷, but may include monitoring outside of key areas. Utilization on non-grass species (forbs, shrubs and trees) may also be measured if appropriate for the site. Utilization may be monitored both during the grazing season (seasonal use) and at the end of the growing season (annual utilization). The Sierra Vista District Range Staff Officer and the permittees will be responsible for monitoring livestock grazing utilization. Over time, changes in resource conditions or management may result in changes in livestock use patterns. As livestock use patterns change, new key areas may be established and existing key areas may be modified or abandoned in cooperation with the permittee(s).

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

3.1.5. Adaptive Management

Livestock grazing on Crittenden, Kunde, Mowry, Papago and O'Donnell allotments would be managed under an adaptive management strategy in accordance with National and Regional direction found in FSH 2209.13 Chapter 90. Adaptive management uses the documented results of management actions (i.e., monitoring) to continually modify management in order to achieve specific objectives. Adaptive management provides the flexibility to adjust livestock numbers and the timing of grazing so that use is consistent with current productivity and is meeting management objectives. Under the adaptive management strategy proposed, the specific number of livestock authorized, specific dates for grazing, class of animal and modifications in allotment use may be administratively modified as determined to be necessary and appropriate, based on implementation and effectiveness monitoring. However, such changes would not exceed the limits for timing, intensity, duration and frequency authorized in the NEPA-based analysis and decision. Administrative changes would be documented and implemented in the AOI which is made part of the term grazing permit. Adaptive management also includes monitoring and analysis to determine whether identified structural improvements are necessary or need to be modified.

Management in Drought

Drought is an ongoing management hurdle for livestock grazing in the southwestern United States. Managing around drought requires a heavy reliance on adaptive management, planning, and conservative stocking. Guidelines for addressing drought are located in a Regional Supplement to the Forest Service Handbook (FSH) 2209.13-2015. The Standardized Precipitation Index (SPI) is a unit of measure that compares recent precipitation values for a period of interest with long term historical values to assess moisture conditions in a given area. In the Southwestern Region, any time the SPI reaches a value of minus 1.00 or less for the preceding 12-month period, grazing allotments should be evaluated for existing drought conditions. This evaluation is site-specific and accomplished through an interdisciplinary approach that includes the livestock producer. Stocking during and after drought will be taken into account to provide for the overall recovery of the resource. Livestock management and drought planning is an ongoing process with

⁷ A key area is a portion of rangeland selected because of its location, use or grazing value as a monitoring location for grazing use, range condition and trend. Key areas are usually ¼ to 1 mile from water, located on productive soils on level to intermediate slopes where prescribed use will occur first. They are 5 acres or more in size. Properly selected key areas will reflect the overall acceptability of current management.

or without the SPI values of a minus 1.00. These conversations take place during AOI development and throughout the year. Drought is one of the primary issues that is considered when making any management decisions related to livestock grazing. Implementing an adaptive management strategy allows for management action in response to changes in climate, such as adjusting stocking levels as needed in periods of below or above average precipitation.

3.2. Alternative 1: No Action (No Grazing)

No action, or no permitted livestock grazing, is included as an alternative in this analysis to provide an environmental baseline against which the effects of the other alternatives may be compared (FSH 2209.13, Ch. 90). Under this alternative, grazing would not be authorized and use of the allotments by domestic livestock would be discontinued. Permittees would be given one year from the date of the decision to remove livestock from the allotments.

Existing structural improvements would remain in place but would not be maintained. Improvements contributing to resource protection or enhancement, such as water developments important for wildlife, would be maintained where feasible using other program funds. Periodic inspection of structural improvements would be used to determine whether maintenance or removal is needed. Removal or maintenance of improvements would be authorized by a separate decision. Where necessary, maintenance of allotment boundary fences would be reassigned to adjacent permittees with the understanding that livestock are to be kept off of the allotment(s).

3.3. Alternatives Eliminated From Detailed Analysis

Continue Current Management. Under this alternative, there would be no change in allotment management. This alternative was not analyzed in detail since it does not meet the purpose and need to manage resources in a manner that achieves Forest Plan objectives and desired conditions. The alternative would not increase management flexibility through the formal implementation of adaptive management.

Reduce Livestock Numbers. During the 30-day comment period, one commenter suggested an alternative to the proposed action that would include a reduction of livestock numbers. The interdisciplinary team determined that an alternative that would reduce livestock numbers would not meet the purpose and need of the proposed action. Monitoring has demonstrated that the allotments can support current and increased permitted livestock numbers while meeting desired conditions. However, there is a need for additional water developments to help with adaptive management implementation. Furthermore, livestock numbers will be adjusted annually to be commensurate with resource conditions.

4. Environmental Impacts of the Proposed Action and Alternatives

This section summarizes the potential impacts of the proposed action and alternatives.

4.1. Past, Present and Reasonably Foreseeable Actions

Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes the action (40 CFR 1508.7). To result in cumulative effects, the effects of an activity must overlap in space and time with the

effects of the alternative analyzed. The temporal boundary for this cumulative effects analysis is 10 years, although the proposed activities may be implemented over a longer timeframe. The spatial boundary for the cumulative effects analysis is the Huachuca Ecosystem Management Area.

The current condition of the Sierra Vista Ranger District was shaped by natural processes (e.g. climate change, wildfire and drought) and past human activities that include fuelwood harvest and grazing. Substantial change to the land was first recorded as occurring during the 1880s when livestock were introduced by settlers.

Past actions are considered to have contributed to the current conditions. The cumulative effects discussions deal primarily with present activities and anticipated future actions that would combine cumulatively with the effects of each alternative considered in this analysis. The discussion of future actions focuses on those actions that are most relevant to cumulative impacts to a specific resource and generally does not include minor, routine, continual activities such as road maintenance, camping, wildlife grazing, and hiking.

The following is a listing of actions considered in the cumulative effects analysis for this project. These actions may contribute effects to some or all affected resources analyzed.

Table 3. Past, present, and reasonably foreseeable actions

Activity	Description of Activity	Area Affected	Implementation Date
Camp Tatiyee land exchange environmental impact statement	The Coronado National Forest proposes to exchange one 344.24-acre parcel of Federal lands in the incorporated Town of Pinetop-Lakeside, Arizona for 1,719.32 acres of non-Federal lands within four national forests in Arizona. The Sierra Vista Ranger District will acquire 76 acres of non-Federal land in this exchange near Harshaw Creek. http://www.fs.fed.us/nepa/nepa_project_exp.php?project=5004	76 acres	2017-2018
Grazing Management	The Sierra Vista Ranger District manages ongoing grazing activities on 32 active grazing allotments, encompassing just over 53,000 head months and situated on 253,364 acres of National Forest System lands.	Huachuca Ecosystem Management Area	Ongoing
Recreational activities motorized and non-motorized	Public recreational activities include numerous locations on the Sierra Vista Ranger District for dispersed recreation, 8 developed recreation sites (campgrounds and day-use sites), one wilderness area (20,238 acres), 115 miles of non-motorized trail, and one lake (Parker Canyon Lake).	Huachuca Ecosystem Management Area	Ongoing
Border Patrol activities	Border Patrol uses existing National Forest System roads to minimize illegal border activities on the Coronado National Forest, such as establishment of unplanned trails and camps, piles of trash and debris left from illegal immigration, property damage, illegal occupancy, threats to public and employee safety, wildfire, and drug trafficking.	Huachuca Ecosystem Management Area	Ongoing
Huachuca FireScape	Fire and fuel reduction projects, including prescribed fire and mechanical treatment of up to 270,000 acres (184,000 of National Forest System lands). http://www.azfirescape.org/sites/azfirescape.org/files/huachuca_decision_notice.pdf	184,000 acres	Ongoing

Activity	Description of Activity	Area Affected	Implementation Date
U.S. Army electronic proving ground special use permit	The Coronado National Forest is proposing to expand the current Sunnyside test area from 100 acres to 626 acres (plus or minus 14) to conduct military sensitive sensor and jamming technique test activities. http://www.fs.fed.us/nepa/nepa_project_exp.php?project=47437	626 acres (plus or minus 14)	2017-2018
Arizona National Scenic Trail Relocation Project (Canelo Hills - West)	The Coronado National Forest proposes relocating the Arizona National Scenic Trail from its current alignment along 1.4 miles of wash bottom (arroyo) to sustainably construct a single track within the Coronado National Forest's Sierra Vista Ranger District, south and west of Ashburn Mountain near RED Bank Well The project has been identified as a priority for trail relocation by the Arizona Trail Association and consistently rates as problematic for trail users who frequently get lost when the trail "disappears" into the arroyo.	896 acres or 1.4 miles	2017-2018
Arizona National Scenic Trail Relocation Project (Canelo Hills - East)	The Coronado National Forest proposes relocating the Arizona National Scenic Trail from its current alignment along 2.5 miles of dirt roads to sustainably construct a single track within the Coronado National Forest's Sierra Vista Ranger District, from southwest of Collins Creek to its current realignment in Middle Canyon. Primary needs for this project include public safety, sustainable recreation, compliance with the National Trails System Act, enhancing the Arizona Trail experience, and responding to input from trail users.	1,600 acres or 2.5 miles	2017-2018
Border 2 and 3 Watershed Restoration	A fuels reduction project with the purpose of watershed restoration.	5,735 acres along the US-Mexico border in the Huachuca Mountains	2018-2021
Perimeter Trail Extension	Proposed extension of an existing trail system on the east side of the Huachuca Mountains.	Huachuca Mountains	2018-2019
Various special use permits	Special use authorizations for activities such as recreation events, communication sites, and research activities.	Huachuca Ecosystem Management Area	Ongoing
Mining activities	Active proposals on the Sierra Vista Ranger District include the Sunnyside Exploratory Drilling Project, a plan of operations that would authorize the proponent to drill exploratory holes to obtain evidence of mineralization.	Flux Canyon in the Patagonia Mountains	2019-2021
Natural processes	Examples include climate change, wildfires, insect and disease, and drought.	Huachuca Ecosystem Management Area	Ongoing

4.2. Cultural Resources

Affected Environment

Cultural resources include archaeological and historical sites, and properties important to maintaining the traditional beliefs and lifeways of local social groups ("traditional cultural

properties”). Under Section §306108 of the National Historic Preservation Act, the Forest Service has the responsibility, in consultation with the State Historic Preservation Officer, Tribes, and other interested parties, to identify historic properties within the area of potential effect and to determine the effects that the proposal could have on cultural resources.

Prior to the initiation and planning of this project, at least 122 cultural inventories have been conducted in the five allotments. These inventories recorded 49 cultural sites inside the project area, including 36 Native American sites, 8 historical sites and 5 sites of unknown origin. Six of the Native American sites have been determined eligible for nomination to the National Register of Historic Places (NRHP), thirty are unevaluated or unknown. All of the historic sites are unevaluated or of unknown eligibility to the NRHP. All unevaluated sites will be treated as eligible for management purposes. Cultural resource site information is protected by federal law in accordance with the National Historic Preservation Act (54 U.S.C. 306108) and the FSH 2309.12(80).

Following the protocol set forth in Appendix H, “Standard Consultation Protocol for Rangeland Management,” of the *Region 3 First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities* (2003), a Class III cultural resources inventory will be conducted by Coronado National Forest archaeologists for all phases of all ground disturbing activity. Consultation with the 12 Native American tribes whose ancestral lands are now managed by the CNF, as well as the State Historic Preservation Office, will be completed as per the conditions of the *Programmatic Agreement* prior to the final NEPA decision. As documented in CNF Cultural Resources Report No. 2019-05-083, all future improvements and ground-disturbing management practices will be contingent upon completion of a cultural resources inventory and the identification and protection of historic properties, all of which will be in compliance with applicable provisions of the NHPA. Any unanticipated discoveries of archaeological remains during project implementation would require all activities to cease, prompt evaluation of the find by the Forest Archeologist, and additional Tribal and SHPO consultation, as necessary.

4.2.1. Alternative 1- No Action (No Grazing)

Direct and Indirect Effects

Under Alternative 1, no direct or indirect effects from livestock grazing on cultural resources would occur following removal of cattle from the allotments. If the No Action Alternative is selected, the proposed improvements would not be built and therefore no cultural resources would have the potential to be affected.

4.2.2. Proposed Action

Direct and Indirect Effects

Although the potential for effects to cultural resources exists under *Alternative 2*, cultural resources inventories will be conducted as part of this analysis. The areas of potential effects for the proposed range improvements will be surveyed for the presence of cultural resources, and if present, cultural resources will be identified, recorded and avoided whenever possible. The inventory will comply with Section 106 of the National Historic Preservation Act, and will include consultation with Native American Tribes and SHPO as per the conditions of the *Region 3 First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities* (2003). Therefore the proposed action alternative would not *directly affect any*

historic properties. Under this alternative, indirect effects would be temporary and consist of limited disturbance associated with ongoing grazing. Should any significant cultural resources be discovered after the inventory during project implementation, additional consultation would be required.

Cumulative Effects

The cumulative effects boundary for cultural resources is limited to the area encompassed by the Huachuca EMA, within the Sierra Vista Ranger District. All previous projects (within the last 20 years) have been completed with a reasonable and good-faith effort to comply with Section 106 of the National Historic Preservation Act. Avoidance of adverse effects to cultural resources is expected for all present and foreseeable projects. Cumulative effects on cultural resources in the Huachuca EMA, now and into the future, may arise as a result of natural disasters and/or accidents, but are not anticipated to occur as the result of project-specific work. Ongoing grazing within the Canelo Hills Allotments would result in no adverse effects to historic properties and the Canelo Hills Allotment Management Plans will be managed through phased inventory and consultation as needed, to assure no adverse effects to historic properties.

4.3. Range

Affected Environment

The project area falls within the Mexican Oak-Pine Woodland and Oak Savannah Land Resource Unit (41-1 AZ) as defined by the Natural Resource Conservation Service (NRCS). The reference NRCS Ecological Site Descriptions (ESDs) used to describe the potential natural community for the purpose of determining rangeland conditions in this project area include clay loam uplands, loamy uplands, loamy hills, limy slopes, shallow hills, and volcanic hills in the 16-20 inch precipitation zone. Long-term rangeland vegetation condition and trend data has been kept since the 1960's by the Forest Service and since the late 1990's has been assessed using comparisons or similarity to the potential natural communities as described in the appropriate ESD for that site. Thus, ecological condition is an expression of the health of the vegetation and soil relative to their combined potential to produce a sound and stable biotic community. Trend is an expression of the plant community's movement toward or away from the potential natural community and is based on a comparison of change over time. Monitoring results from 24 long-term range transects within the project area show that 50% of the project area is in high similarity index, and 50% is in mid similarity index. Trends are primarily upward with several in a stable trend. Analysis of vegetation monitoring transects across the project area have resulted in overall conditions that meet or are moving toward Forest Plan standards.

Table 4. Trend data for allotments within the project area

Allotment	Pasture	Condition	Trend
Crittenden	3-C Pasture	Mid Similarity	Upward
	Oak Grove Pasture	Mid Similarity	Upward
	Red Bear Pasture	Mid Similarity	Upward
	E. Redrock Pasture	Mid Similarity	Upward
	W. Redrock Pasture	Mid Similarity	Upward

Allotment	Pasture	Condition	Trend
Kunde	Upper Lampshire Pasture	High Similarity	Upward
	Lower Lampshire Pasture	Mid Similarity	Upward
	Sorrels Pasture T2	High Similarity	Upward
	Sorrels Pasture C1	Mid Similarity	Static
	Bible Pasture	High Similarity	Upward
	Redrock Pasture	High Similarity	Static
Mowry	South Pasture	Mid Similarity	Static
O'Donnell	Bull Pasture	High Similarity	Upward
	Canelo Pasture	High Similarity	Static
	Lower Pauline Pasture	Mid Similarity	Static
Papago	South Mountain Pasture	High Similarity	Upward
	West Mountain Pasture	Mid Similarity	Static
	Pinto Pasture	High Similarity	Upward
	Papago Pasture	Mid Similarity	Upward
	North Pasture	High Similarity	Upward
	Middle Pasture	High Similarity	Upward
	Collie Pasture	High Similarity	Static
	Cemetery Pasture	High Similarity	Static
	Mac Wood Pasture	Mid Similarity	Static

4.3.1. Alternative 1- No Action (No Grazing)

Direct and Indirect Effects

Under the No Action Alternative, direct effects from livestock grazing on range resources would provide for a buildup of fine fuels across the project area and would allow for fire to play a more natural role. This could lead to shift in vegetation, removing canopy cover of common tree and shrub species within the project area. If the No Action Alternative is selected, the proposed range improvements would not be built and therefore no short-term effects to rangeland resources, in the form of isolated ground-disturbing activities, would occur. Indirect effects would be that existing improvements contributing to resource protection or enhancement, such as water developments important for wildlife, would be maintained where feasible using other program funds. Periodic inspection of structural improvements would be used to determine whether

maintenance or removal is needed. Removal or maintenance of improvements would be authorized by a separate decision. Where necessary, maintenance of allotment boundary fences would be reassigned to adjacent permittees with the understanding that livestock are to be kept off of the allotment(s).

4.3.2. Proposed Action

Direct and Indirect Effects

The Proposed Action would provide flexibility to make adjustments when a trend in range condition is detected or when climatic conditions, such as drought, warrant a change in management. Low to moderate utilization rates, along with additional upland water sources, would help to maintain mid to high similarity indices across the project area. Livestock grazing would be managed under a deferred use/rest rotation system. Following use, a pasture would receive adequate rest before being available to be grazed again. Pastures would not typically be grazed at the same time each year and the same pastures would not be used in consecutive growing seasons. These practices will also help to maintain vegetation composition, density, vigor, and recruitment. By providing growing season rest, or deferment, in pastures the proposed action will allow for growth and reproduction of perennial grasses each summer and will allow for litter to accumulate, thus further protecting soils from erosion during precipitation events. Low to moderate utilization rates will ensure that sufficient residual biomass will be left to protect soils and also provide herbaceous cover for wildlife. Indirect effects to rangeland resources would occur during construction of the proposed water improvements. However, those impacts will take place within a short time frame, using best management practices, and vegetation will quickly recover after installation has occurred.

Cumulative Effects

Camp Tatiyee Land Exchange would not contribute to any cumulative effects if the proposed action is chosen, as it is outside of the project area.

Over the past 20-30 years, rangeland monitoring has informed adaptive management decisions to ensure desired conditions are met on rangelands across the Forest. Grazing management on other allotments within the Huachuca EMA utilize the same monitoring methods to ensure Forest Plan standards are met. Similar livestock management to that of the proposed action is also being implemented on these other allotments with respect to intensity and rest for grazed pastures. As mentioned in Chapter 3.1.3, these grazing intensities would provide for grazed plant recovery, increased herbage production, and retention of herbaceous litter to protect soils and provide forage and cover for wildlife (Holechek et al 2004). Based on monitoring results from surrounding allotments within the Huachuca EMA, these allotments along with the implementation of this project would not contribute to cumulative effects.

Recreational activities such as dispersed camping and visitor use of non-motorized trails, to include relocation projects for the Arizona National Scenic Trail, have coincided for many years within the project area. Recreational activities would continue to occur if the proposed action is chosen, but would not contribute to cumulative effects to rangeland resources within the project area.

Border Patrol activities occasionally require cross country travel which can lead to soil compaction and trampling of vegetation. These are generally short term effects, and they are usually minimized by implementing best management practices for utilizing vehicles off roads. However, the proposed action would not contribute to any cumulative effects.

Huachuca FireScope is a large scale vegetation management project to promote restoration of vegetation resources on a landscape scale. The effects are generally conducted with a prescription that would encourage ecological condition of the project area. Some projects do require cross country travel which can lead to soil compaction and trampling of vegetation. These are generally short term effects, and they are usually minimized by implementing best management practices for utilizing vehicles off roads. There are currently no prescriptions for Huachuca FireScope within the project that are planned for implementation. The proposed action would not contribute to any cumulative effects.

The U.S. Army Electronic Proving Ground project falls outside of the project area and therefore would not lead to cumulative effects.

Border 2 and 3 Watershed Restoration projects are located outside of the project area and would not lead to cumulative effects.

Mining activities within the Huachuca EMA are not expected to have any cumulative effects under this alternative. In general these projects are analyzed as they are proposed and can affect rangeland resources by removing or compacting soil and removing or trampling vegetation. These projects would also reclaim disturbed areas to mitigate effects.

4.4. Special Status Species

Affected Environment

The affected environment for wildlife, fish, and rare plants consists of a spatial and temporal component. Temporally, it consists of the current status of these biological resources and the components that shape their habitats and predictions of how these populations and other resource areas may change over time. For wildlife, fish, and rare plants, trend data was used, if available, to predict future distributions of populations and individuals. If this data was lacking, habitat was used to estimate future distributions of species.

Spatially, the affected environment used in the analysis was the area of the five allotments. The affected environment for species was focused based on occurrence data, habitat present, and a combination of those two elements. For most species (threatened and endangered, candidate, Forest Service sensitive, and focal), precise distributions are not well known or they are relatively common and widely distributed across the affected environment. For those species, historical data and potential habitat was used to focus the analysis.

For the cumulative effects analysis, the affected environment differs depending on the legal status of the species. For threatened and endangered species, cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area. Future Federal actions that are unrelated to the modified proposed action are not considered for threatened and endangered species because they require separate consultation pursuant to section 7 of the Endangered Species Act (50 CFR section 402.02).

Threatened and Endangered Species

Effects of the ongoing grazing activities on the allotments have been evaluated in Biological Assessments (BA) of Ongoing and Long-term Grazing on the Coronado National Forest. A Biological Assessment and Evaluation (BAE) for the Canelo Hills Allotments, which tiers to the

programmatic BA and also includes RFSS and migratory birds, has been completed and is summarized below. The action area for the BAE analysis is the same as the proposed project area: the Canelo Hills allotments. This tiers to the scope of activities described in the programmatic BA.

Four listed species occur near the affected environment but not close enough for the proposed action to have an effect on their status. Those species are: Canelo Hills Ladies' Tresses, Gila chub, desert pupfish, and the Mexican spotted owl.

Seven species listed under the Endangered Species Act are known to occur within the affected environment. A description of their natural histories, including a complete list of their threats, can be located at the U.S. Fish and Wildlife Service website:

http://www.fws.gov/southwest/es/arizona/Docs_Species.html

Gila topminnow (*Poeciliopsis occidentalis*): Gila topminnows can tolerate a wide array of aquatic habitats but prefer shallow, warm, waters. Historically Gila topminnow has been documented throughout Redrock Canyon since 1978 (USFWS 2008). The status of the Redrock Canyon population has declined recently and the species has not been documented since 2005 (USFWS 2008). Although range and riparian conditions have largely improved, the area has been in drought since 1995 and the resulting reductions in habitat as stream channels have dried. Perennial surface water has been reduced in extent, along with increases in nonnative species, primarily mosquitofish, have apparently extirpated the Gila topminnow from the drainage (USFWS 2008).

Sonoran tiger salamander (*Ambystoma tigrinum stebbinsi*): The Sonoran tiger salamander is known from 71 localities, 90 percent of which falls in lands managed by the Sierra Vista Ranger District. All sites where Sonoran tiger salamanders have been found in Arizona are located in the Santa Cruz and San Pedro river drainages, including sites in the San Rafael Valley and adjacent portions of the Patagonia and Huachuca mountains in Santa Cruz and Cochise counties. All confirmed historical and extant aquatic populations are found in cattle tanks or impounded ciénegas within 19 miles of Lochiel, Arizona.

On the Sierra Vista Ranger District, the distribution of the Sonoran tiger salamander is almost completely encompassed by the Santa Cruz River and the Las Nutrias headwaters of the 5th hydrologic unit code watershed, however, there are some occurrences outside this boundary and within the affected environment.

Chiricahua leopard frog (*Rana chiricahuensis*): The Chiricahua leopard frog is found in mountain regions of central and southeastern Arizona, southwestern New Mexico, and south into Mexico in elevations from 3,200 to 8,900. Historically, it occurred in springs, creeks, rivers, cienegas, perennial plunge pools and tinajas in intermittent drainages, but currently most often found in earthen stock tanks and above-ground stock drinkers. It is a highly aquatic species requiring perennial to near-perennial water sources to complete its life cycle.

Within the affected environment, known populations of Chiricahua leopard frog occur in Hidden Tank, O'Leary Tank, and Little Mahoney Tank. No designated critical habitat for the Chiricahua leopard frog occurs within the affected environment.

Northern Mexican gartersnake (*Thamnophis eques megalops*): The Northern Mexican gartersnake is considered to occur throughout the Sierra Vista Ranger District but at very low

densities. The most robust populations occur adjacent to the Sierra Vista Ranger District in the Upper Santa Cruz River in the San Rafael Valley. A stable native prey base consisting of fishes and adult and larval ranid frogs is an important component of Mexican gartersnake habitat. The Sierra Vista Ranger District contains some of the largest segments of the proposed Northern Mexican gartersnake critical habitat, occupying O'Donnell Canyon, Post Canyon, Turkey Creek, Redrock Canyon, Bear Creek, and the Upper Santa Cruz River subbasin.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*): Yellow-billed cuckoos are neotropical migrants that winter in South America and spend the summer months within an area stretching from northern Mexico to southern Canada. In Arizona, yellow-billed cuckoos arrive on the breeding grounds in late May to early June. Most western yellow-billed cuckoos begin their fall migration in late August through mid-September.

Cuckoos typically breed in large blocks of riparian woodland (more than 50 acres) at elevations below 7,000 feet (Halterman et al. 2013) and in cottonwood-willow-tamarisk vegetation associations that often possess a mesquite component; however, on the Coronado National Forest, yellow-billed cuckoos have been found in a variety of habitats and are not always associated with water or deciduous riparian forest (Forest Service unpublished data). Within the affected environment, yellow-billed cuckoos have not been documented, but likely occur within many of the major drainages such as Redrock Canyon, Dark Canyon, etc. Currently, there is no proposed yellow-billed cuckoo critical habitat within the affected environment.

Ocelot (*Lepardus pardalis*): Ocelots are found in many habitat types. Animals in the Arizona/Sonora Management Unit tend to prefer subtropical thornscrub to tropical deciduous forest (USFWS 2010) but data is lacking for animals specific to Arizona. Since 2009, detections of ocelots in southeast Arizona have increased (USFWS 2010; personal communication, Erin Fernandez, FWS, 2014), with most of the detections coming from three males occupying the Huachuca and Santa Rita mountain ranges (personal communication, Erin Fernandez, FWS, 2014). In 2013, one of the individuals regularly photographed in the Huachuca Mountains was also photographed in the Patagonia Mountains (personal communication, Erin Fernandez, FWS, 2014) which are separated by approximately 15 to 20 miles of grasslands, Interior Chaparral, Madrean Pine-Oak Woodland, and Madrean Encinal Woodland. The U.S. Fish and Wildlife Service considers all Madrean evergreen woodland south of Interstate 10 to be occupied by ocelots (personal communication, Erin Fernandez, FWS, 2014).

Jaguar (*Panthera onca*): In Arizona, New Mexico and northern Mexico, jaguars use open, dry habitat, including desertscrub, thornscrub, lowland desert, mesquite grassland, Madrean oak woodland, and pine-oak woodland communities (USFWS 2012). Jaguars have probably never been common in Arizona, but they were consistently documented in the state from the late 19th to the mid-20th century (Hoffmeister 1986). Since the mid-1900s, jaguar sightings in Arizona have declined, but that may have been the result of exogenous factors and not actually a reduction in their numbers (McCain and Childs 2008).

There are currently no known breeding populations in the U.S., and jaguars in Arizona are likely part of a population, or populations, that occur in Mexico. The northernmost known breeding population is in east-central Sonora, approximately 130 miles south of the U.S. border (Brown and Lopez-Gonzalez 2001). Jaguar critical habitat was designated in 2013.

Forest Service Sensitive Species

To determine which Forest Service sensitive species may occur within the affected environment, primarily two sources of plant and animal occurrence data were used: Heritage Data Management System (HDMS) and SEINet. HDMS data was analyzed by putting a 0.5-mile buffer around the allotment boundaries and then clipping the HDMS data to that polygon. The resultant species list was cross referenced with the FSSS list. A 0.5-mile buffer was used because it was thought that this distance would capture species that could potentially occur within the affected environment but have not yet been documented in the affected environment. The animal list was also cross referenced with Ebird and Hoffmiester (1986). For plants, only HDMS and SEINet were used. A total of 10 plants and 11 animals were used for the analysis of the alternatives (Table 5).

Table 5. Summary of Forest Service Sensitive Species that may occur within the project area

Common Name	Scientific Name
Arid Throne Fleabane	<i>Erigeron arisolius</i>
Beardless Cinchweed	<i>Pectis imberbis</i>
Bush-violet	<i>Browallia eludens</i>
Greene Milkweed	<i>Asclepias uncialis</i>
Huachuca Golden Aster	<i>Heterotheca rutteri</i>
Metcalf's Tick-trefoil	<i>Desmodium metcalfei</i>
Smooth Baby-bonnets	<i>Coursetia glabella</i>
Sonoran Noseburn	<i>Tragia laciniata</i>
Tepic Flameflower	<i>Phemeranthus marginatus</i>
Wiggins Milkweed Vine	<i>Metastelma mexicanum</i>
Desert Sucker	<i>Catostomus clarkii</i>
Lowland Leopard Frog	<i>Lithobates yavapaiensis</i>
Arizona treefrog	<i>Hyla wrightorum</i>
Slevin's Bunchgrass Lizard	<i>Sceloporus slevini</i>
Northern Goshawk	<i>Accipiter gentilis</i>
Northern Green Ratsnake	<i>Senticolis triaspis intermedia</i>
Violet-crowned Hummingbird	<i>Amazilia violiceps</i>
Abert's Towhee	<i>Melospiza aberti</i>
Gould's Wild Turkey	<i>Meleagris gallopavo mexicana</i>
Mexican Long-tongued Bat	<i>Choeronycteris mexicana</i>
Hooded Skunk	<i>Mephitis macroura milleri</i>

Four different bat colonies have been documented within the affected environment. These locations were also included in the analysis of the FSSS because several FSSS have been documented in these features and overall, they are unique and important features for bat populations.

Environmental Effects

4.4.1. Alternative 1- No Action (No Grazing)

Threatened and Endangered Species

Under the No Action Alternative, there would be no adverse effects to listed species or their habitat. Some existing improvements support populations of listed species, e.g. Chiricahua leopard frogs at Little Mahoney Tank. Required maintenance of these improvements to maintain populations of listed species would need to be absorbed by the CNF and its partners.

Forest Service Sensitive Species

Under the No Action Alternative, there would be no adverse effects to FSSS or their habitat. Some FSSS also use existing improvements (see above example). Lack of maintenance or decommissioning of existing improvements would not cause a decline in population viability or a trend towards federal listing.

4.4.2. Proposed Action

Threatened and Endangered Species

Gila topminnow: Livestock grazing has the potential to impact Gila topminnow and its habitat, often through vegetation removal and trampling of streambanks. Livestock grazing in locations where large numbers of animals congregate can impair water quality and their waste products can deteriorate water quality resulting in alteration of fish communities or fish kills. Sedimentation from erosion caused by livestock can impair spawning areas and reduce aquatic productivity, which can affect food production. Grazing at utilization levels appropriate for specific vegetation communities can reduce these impacts and is consistent with Gila topminnow recovery. The CNF proposes to maintain the general strategy of the grazing regime described in the 2002 Biological Opinion and 2019 Biological Assessment; therefore, these impacts, are not expected to be widespread or excessive, per the Desired Conditions and Standards and Guidelines for the Range Program as well as Guidelines for Riparian Areas, Natural Water Sources, and Constructed Waters that apply to the Range Program that are identified by the Forest Plan. The proposed action may affect, and is likely to adversely affect, the Gila topminnow.

Sonoran tiger salamander: Potential effects to the tiger salamander that may be attributable to livestock grazing include habitat degradation by reducing cover at and near tanks and/or contributions to increased erosion and siltation. Grazing in accordance with CNF standards and guidelines should provide adequate protection of watershed values in regard to potential grazing impacts and make landscape-level effects from erosion insignificant. Livestock may trample salamander larva, adults and/or eggs. Maintenance, or the cleaning of stockponds using heavy equipment, is necessary to maintain these features and may result in mortality of salamanders and eggs and loss of shoreline cover. Implementing the Stockpond Management Plan will help reduce some of these effects to tolerable levels while maintaining important habitat for the salamander and other aquatic species. The proposed action may affect, and is likely to adversely affect, the Sonoran tiger salamander.

Chiricahua leopard frog: Although Chiricahua leopard frog coexists with grazing activities at most sites, livestock management activities can result in the direct mortality of CLF and degradation of their habitat. Direct mortality or injury of frogs may occur at stockponds where maintenance activities result in significant disturbance at the tank (e.g., dredging or silt removal,

major repair of berms) and frogs are present during the maintenance activity. Maintenance activities may also help expand populations of harmful nonnative species. Implementing the Stockpond Management Plan, would reduce the amount of direct mortality and habitat degradation caused by maintenance activities. Some of the planned improvements may help expand populations of leopard frogs. The proposed action may affect, and is likely to adversely affect, the Chiricahua leopard frog.

Northern Mexican gartersnake: Livestock grazing generally has indirect effects to gartersnakes. While trampling of gartersnakes can occur, it is considered exceedingly uncommon and not reasonably certain to occur. Direct mortalities can also occur from the maintenance and construction of Range Improvements, but mortalities from these actions are not considered reasonably certain to occur. Much like the salamander, leopard frog, and topminnow, livestock grazing in occupied gartersnake habitat is largely compatible with conservation and recovery of gartersnakes provided that potential adverse effects to primary prey species (fish and amphibians) are generally insignificant. Adopting the proposed conservation measures should have largely positive effects on gartersnakes as well. Managing riparian habitats according to FS policy and adopting the Stockpond Management Plan, should have positive effects on gartersnakes and their native prey base. Any range improvements that also benefit native fish and amphibians would also improve habitat for gartersnakes. The proposed action may affect, and is likely to adversely affect, the northern Mexican gartersnake.

Western yellow-billed cuckoo: Livestock grazing could cause adverse effects to YBCU in the form of habitat loss: trampling and herbivory/ removal of biomass (i.e., grasses, forbs and tree seedlings) by livestock could reduce and/or alter composition, structure, and density of understory and overstory vegetation. These impacts, however, are not expected to be widespread or excessive, per the Desired Conditions and Standards and Guidelines for the Range Program as well as Guidelines for Riparian Areas, Natural Water Sources, and Constructed Waters that apply to the Range Program that are identified by the Forest Plan. The proposed action may affect, and is likely to adversely affect, the western yellow-billed cuckoo.

Ocelot and Jaguar: Site specific resource conditions and management objectives will be used to result in light to moderate forage utilization, which will not result in clearing of habitat, destruction of riparian areas, or fragmentation. Impacts to habitat via grazing are localized and transitory, and when considered at a landscape scale, do not significantly impact prey availability on the CNF. Grazing activities will not increase noise or lighting within jaguar and ocelot habitat. The proposed action may affect, but is not likely to adversely affect, the ocelot and jaguar.

Forest Service Sensitive Species

For FSSS, some disruption of individuals might occur from the proposed action. This disruption is anticipated to be minimal scope, duration, and intensity because of the utilization standards and the rest-rotation system outlined in the Forest Plan and the proposed action. Although individuals may be impacted as a result of the proposed action, the effects would not cause a loss in population viability or a trend in population toward Federal listing.

Cumulative Effects

Threatened and Endangered Species

Within the affected environment, the Coronado National Forest manages the majority of lands that are important habitat for threatened and endangered species. Thus, most activities that could

affect threatened and endangered species are federal activities subject to Section 7 consultation and therefore not considered in this cumulative effects analysis. Examples of these kinds of actions include management of fuels reduction activities and mineral activities.

Activities in the vicinity of the project area that are reasonably certain to occur in important threatened and endangered species habitat but are not subject to Section 7 analysis include illegal activities and actions on private lands. Examples of illegal activities that may affect threatened and endangered species include: inappropriate use of off-highway vehicles, illegal woodcutting, illegal transportation of live wildlife, and poaching. Illegal activities are difficult to predict and are assumed to occur indefinitely and uniformly throughout the vicinity of the Sierra Vista Ranger District and are not expected to contribute to the adverse impacts from the proposed action.

Activities occurring on private lands may include residential development, farming/ranching, road construction and maintenance, and mineral exploration. These activities could potentially affect threatened and endangered species through habitat destruction or degradation and harassment of individuals. Many of the private lands near or within the Sierra Vista Ranger District have already been developed and no new major developments of private lands are expected to occur; therefore, future activities on private lands are not expected to contribute to adverse impacts to threatened and endangered species or their critical habitat from the modified proposed action.

Forest Service Sensitive Species

Most of these State or Federal actions are subject to some level of environmental regulation. Recreation, livestock grazing, Huachuca FireScape, Arizona National Scenic Trail relocation projects, electronic proving ground, mining activities, and Border Patrol activities are ongoing activities, some of which are managed by the Coronado National Forest. Currently, they are not contributing impacts to Forest Service sensitive species, and the contribution of the proposed action is not expected to contribute to any adverse impacts.

Migratory Birds

The Migratory Bird Treaty Act of 1918, as amended (16 USC 703–712), gives federal protection to all migratory birds, including nests and eggs. Under this act, it is unlawful to take, kill, or possess migratory birds. Most birds likely to occur in the project area are protected under the MBTA, which provides federal protection to all migratory birds, including nests and eggs. No impacts to birds of conservation concern are expected. Because grazing activities are monitored regularly and are planned to be maintained at light to moderate intensity, impacts from grazing should not reach significant levels to cause negative impacts or downward population trends leading toward Federal listing for any species of conservation concern.

4.5. Watershed

4.5.1. Alternative 1- No Action (No Grazing)

Direct and Indirect Effects

Under this alternative, grazing would not be authorized and use of the allotments by domestic livestock would be discontinued. Permittees would be given one year from the date of the decision to remove livestock from the allotments.

The condition of the Upper Sonoita Creek watershed is Functioning Properly. The conditions of the remaining watersheds are Functioning at Risk, often due to fire regime, water quantity, aquatic habitat, roads and trails, and other factors such as invasive species that vary by watershed. Rangeland vegetation and soil condition are rated at good or fair.

The allotments are mostly in high and mid ecological condition, with upward and stable trends, and with good species diversity and cover. Soil condition is satisfactory. Current grazing management has, at least in part, led to these satisfactory results. It is therefore not expected that a lack of livestock on the allotments would significantly improve the soil condition on the majority of the allotment area over what is currently occurring since existing management has already resulted in satisfactory soil conditions and primarily stable ecological conditions.

The same can be said for wind erosion effects to air quality on the majority of the allotment area. With sufficient vegetation to hold the soil in place over the majority of the grazed rangeland due to a light to moderate utilization level, not to mention the abundance of rock, it is not expected that the lack of livestock would increase plant productivity in these majority areas to an extent that would significantly improve any wind-blown erosion that may occur in these areas.

Any small areas where soil condition is currently being negatively impacted by grazing, such as may occur in areas of heavier use (near water sources, for example), would be expected to improve over time. Vegetation productivity and diversity would begin to improve, and soil compaction would lessen over time. With an improvement in soil condition and vegetation productivity, any soil erosion which may be occurring in these areas would be expected to lessen over time. Also, any wind erosion which may occur in these areas due to lack of vegetative cover and soil disturbance would be expected to lessen with time as vegetative cover becomes more established and productive.

Areas of riparian vegetation that receive preferential livestock grazing use along drainages would be expected to improve in condition with the absence of livestock. These drainage areas tend to be preferentially grazed and trampled due to the at least occasional presence of water and lush vegetative growth. Therefore, a lack of livestock will help improve riparian condition where livestock are not already excluded from these areas. Livestock are already excluded from riparian areas along streams with perennial or strongly intermittent flow.

However, it is not expected that overall watershed water quality would significantly improve on the majority of the allotment area. For one, any areas of higher utilization that may contribute a greater amount of contaminants such as sediment from soil erosion, and nutrients and *E. coli* from manure, are relatively small as compared to overall watershed size. Most importantly, the existing grazing utilization of light to moderate on the majority of the grazed allotment area leaves plenty of vegetative cover to reduce erosion and runoff into streams during flood events. Therefore, minimal change in water quality is expected on the majority of the allotment area through this alternative over what already occurs. However, where cattle are grazing in areas of riparian vegetation along major drainages, localized water quality can be improved with the absence of livestock waste in the drainages.

4.5.2. Proposed Action

Direct and Indirect Effects

The proposed action proposes to incorporate an adaptive management strategy. The adaptive management approach provides for continuous improvement of management effectiveness based

on a “monitoring and adapt” strategy that allows management to change with changing resource conditions. Using adaptive management, specific numbers of livestock would be set each year based on resource conditions and management objectives for the allotment. Pasture rotation would be planned at the beginning of each grazing year and may be continually modified in response to changing resource conditions with the objective of not grazing any one pasture during consecutive growing seasons.

Based on the need for action, activities have been identified for each allotment. They include pipeline, watering facilities, fence, and other practices to improve grazing management. They also include changing livestock numbers in response to added pasture, monitoring, historical stocking records, and completed range improvements for improved livestock distribution.

In addition, resource protection measures for the timing, intensity, duration, and frequency of livestock grazing would also be implemented. Grazing authorizations would be accomplished through the issuance of a new 10-year term grazing permit. A new Allotment Management Plan would be developed for the allotment to implement the NEPA decision.

Direct and indirect effects over what already occurs would be expected to be minimal since this alternative, as proposed, would have the same grazing utilization levels as already occurs. Consistent patterns of forage use levels in excess of light to moderate (30-45%) on key species in key areas would indicate a need for management modification or administrative actions. This management adjustment is the same as the existing situation. So, although the number of cattle permitted to graze will generally increase on some of the allotments, the allowed utilization rate will remain the same. Also, although number of cattle, timing, and grazing duration may be changed, they may not exceed that which is defined in the proposed action.

Current utilization levels and management have led to satisfactory soil conditions across the project area. The proposed management will remain unchanged from current utilization levels and soil conditions are expected to remain in satisfactory condition on all allotments. Wind erosion attributed to grazing impacts would also be expected to remain the same, and would be expected to remain minimal. This is since the existing grazing utilization is light to moderate, leaving sufficient vegetation on the majority of the allotment to minimize wind erosion. Soil rock content also helps to hold soil in place.

In small, localized places of higher livestock concentration on the allotments, such as that which occurs near water sources, soil condition is more likely to be impacted by soil compaction and lack of vegetation. Soil erosion may also be an issue in these areas, particularly where the slopes are greater, due to lack of vegetative cover, compaction, and disturbed soil. Lack of vegetative cover and disturbed soil condition also increases the potential for wind erosion in these areas. Wind erosion and water-based soil erosion may somewhat worsen over time in these smaller areas since these areas of diminished vegetation and soil condition would continue and possibly worsen and expand with increased livestock numbers using these more heavily utilized areas. However, in pastures where additional water developments will be placed, the installation of these additional water sources would be expected to more evenly distribute livestock among new and existing water sources, decreasing the soil resource damage at any one water source that may otherwise have occurred from increased livestock numbers at a smaller number of water sources. The number of these more heavily used areas would increase with the installation of new water sources. However, each of these areas will have less utilization by livestock due to the increased number of potential water sources. Therefore, it is expected that there will be no net increase in the overall area that is more heavily compacted and grazed.

The installation of the pipeline, tanks, troughs, and other range infrastructure will cause short term damage to soil resources due to disturbed and exposed soil. Best management practices (BMPs) and design features will reduce the potential for erosion issues. However, the trench and other exposed areas should be monitored closely for water-based soil erosion, particularly on steeper slopes, and any evidence of this will need to be addressed. Until vegetation re-establishes, there will be an increased potential for soil erosion from these disturbed areas. In the long term, vegetation will re-establish and diminish the potential for soil erosion. How long this may take will depend on such factors as rainfall, slope, aspect, soil type, and the success of BMPs implemented.

There may be some short term wind erosion from excavation of a trench for the pipeline and the subsequent burial of the pipeline in the trench. However, this wind erosion is expected to only occur in the short-term during pipeline installation and to be minor in extent. It is not projected that it will affect overall air quality in the area. Also, the use of design features and BMPs as specified within this report, and as otherwise applicable, will help reduce the potential for wind erosion both in the short term and long term. In the long term, establishment of vegetation will also help reduce the potential for wind erosion on the affected area, and should eventually return the affected area to normal or near-normal erosive conditions as existed prior to the excavation.

Unexcluded areas with riparian vegetation on the allotments would continue to be grazed. In general, these areas tend to be more heavily utilized and trampled due to the presence of water and/or lush vegetation. However, the drainage areas on the allotments with predominant riparian vegetation will be managed to reduce grazing effects through the requirement for only dormant season grazing. Also, they will be monitored closely, and reductions in riparian condition will serve as a guide for management action to reduce or eliminate these effects. Therefore, although riparian condition in these drainages will not be as could be expected without livestock, actions will be taken to ensure that negative impacts will be minimized.

Water quality is not expected to change over what already occurs on the majority of the allotment area since the grazing utilization will remain the same. Grazing at light to moderate utilization has kept the range condition at a stable to upwards trend, so it would be expected that runoff and soil erosion would be minimized, maintaining a reduced potential for water quality impacts from grazing. With utilization levels kept the same, it is also not expected that contaminants from manure, including *E. coli* and nutrients, would significantly change.

As for water quality effects from areas of higher utilization, such as areas near water sources, it would be expected that lack of vegetation and increased soil compaction would continue to result in an increased potential for soil erosion, particularly where the slopes are greater. However, due to the relative small size of these more heavily utilized areas and the expected relatively small magnitude of the problem, and as compared to the much larger size of the watershed, overall water quality impacts to more significant streams downslope would be expected to be minimal.

Riparian areas along perennial or strongly intermittent streams are excluded from livestock use with fencing. Livestock grazing in other drainages with at least some riparian vegetation and at least occasional presence of water can be expected to contribute sediment, nutrients, and *E. coli* to these drainages. It is not expected that these contaminant introductions from livestock use would significantly increase, and they may even decrease. This is due to dormant season grazing and monitoring of these riparian areas (with the potential to require management changes as a result of monitoring indicating riparian condition decline), which will help to minimize effects from livestock grazing in these drainages. Also, utilization rates will remain the same.

The Redrock pasture is proposed for addition back into livestock grazing rotation. This pasture hasn't been grazed by livestock since the early 2000's. The addition of livestock would be expected to reduce the overall herbaceous vegetation height and density, but grazing utilization levels of light to moderate would be expected to leave sufficient vegetation to continue to minimize erosion potentials. The effects of the addition of livestock to Redrock Canyon in the Redrock pasture would be minimized with dormant season only grazing and existing exclusion fencing where there is perennial water. In addition, riparian areas will be monitored, and administrative actions taken if riparian condition is declining. However, it can be expected that riparian vegetation will be grazed, and that livestock use of riparian areas will contribute increased sediment, nutrients, and *E. coli* to these drainages.

Cumulative Effects

Cumulative effects for this analysis will include area within the Huachuca Ecosystem Management Area (EMA). It can reasonably be expected that activities occurring or that have occurred within the Huachuca EMA may have impacts on the allotment area. The grazing permit length is ten years, so the cumulative effects analysis will include projects occurring within the next ten years. Projects, activities, and circumstances occurring in the past will not be analyzed in the cumulative effects analysis since they can reasonably be expected to affect the current environment, which has already been assessed through this report.

As a result of the Camp Tatiyee Land Exchange, it is expected that 76 acres of land located near Harshaw Creek will be added to the Huachuca EMA. It is not expected that the project would have any significant effects on this land exchange.

Livestock grazing occurs on 35 grazing allotments on 253,364 acres on the Sierra Vista Ranger District. This grazing can have its own effects on natural resource conditions for these allotments. These effects can add to or detract from effects occurring on other allotments within the same watershed, and so can combine to result in reduced or improved watershed conditions for that watershed, depending on the grazing and its effects. So, although these other allotments have different grazing permits and conditions, in terms of watershed condition, that watershed condition would be impacted by all allotments with significant land area within the watershed.

Recreation impacts include public recreation uses of trails, campgrounds, wilderness area, Parker Canyon Lake, and dispersed recreation throughout. Vehicular travel on unsurfaced roads can affect localized air quality due to dust. The unsurfaced roads can be more erosive and lead to erosion on slopes surrounding them due to runoff concentration on the roads leading to channelized erosion coming off of the roads. For campground use, vegetation is diminished and soils are compacted, which can lead to increased wind and rain-induced soil erosion depending on slope and other site conditions. It is not expected that the implementation of either of the alternatives for this project will cause significant additional impacts to watershed resources over impacts that would occur through recreational use. Although grazing can reduce the height of vegetation near campgrounds and roads, the utilization rate is planned to leave sufficient vegetation quantity and density to prevent erosion concerns.

Border Patrol accesses existing Forest Service roads to minimize illegal border activity. Their use of existing roads would not be projected to add to erosion concerns on these roads since the roads are already in a compacted state and are already subject to increased erosion rates. In the course of their work, they also help to prevent resource damage from illegal activity. It is not

expected that the implementation of either of the alternatives for this project will cause significant additional impacts to watershed resources over those that occur for Border Patrol activities.

Huachuca FireScape seeks to reduce fire fuel load of 270,000 acres, of which 184,000 are on National Forest System lands. This project will also help to improve herbaceous cover, which will decrease the potential for erosion, and overall improve watershed conditions. The project will also help to prevent damage to soil resources from intense wildfires. It's not projected that the project activities would have significant additional impacts over those occurring through Huachuca FireScape. Livestock grazing can reduce the height of herbaceous vegetation and reduce rank vegetation, which can help reduce available fuel loads for a fire. It will, however, have limited impacts to the woody vegetation that is planned for reduction through Huachuca FireScape.

It is proposed that the U.S. Army Electronic Proving Ground in the Huachuca Mountains will increase in size from 100 acres to 626 acres (plus or minus 14 acres). This project is located near the US Mexico Border, proximal to Campini Mesa. It will allow for the placement of 10 temporary storage buildings. It is not projected that any small-scale watershed impacts from this project at this location will be significantly impacted by the Canelo range project nor that the project would have significant impacts on the Canelo range project.

The Arizona Trail is planned for relocation where the need has been identified. Also, the Perimeter Trail is planned for expansion. Trails commonly have compacted soils and can result in increased potential for erosion on and off the trails due to runoff collecting on the trail and then moving off as concentrated flow. Grazing utilization rates are planned at light to moderate on the allotments so that the resulting vegetation will be at a level that will not increase the potential for erosion over what might have naturally occurred.

The Border 2 and Border 3 watershed restoration projects are for woody vegetation reduction, and will increase herbaceous vegetation, reducing erosion potential and improving watershed condition. They are located just west of Montezuma Pass, along the US/Mexico border. It is not expected that watershed impacts of the Border 2 and Border 3 projects at this location would be significantly affected by the watershed impacts of the Canelo range project or vice versa.

Special use permits can have impacts to watershed resources, depending on the nature of the special use permit. In general, the permits normally have minimal impacts to watershed resources since requirements for resource protection are put in place as part of the permit. Although it's hard to predict what special use permits may be issued in the coming years, it can generally not be expected that the Canelo range project would have significant additional watershed impacts to any impacts which may result from the special use permits.

Surface and underground mining is a ground disturbing activity by definition and causes many effects, some irreversible, to the environment. Mining activity can have adverse effects to soil and water quality caused by excess sediment and pollutants from areas of waste rock dumps or processed ore. Water quantities may also be impacted since large volumes of water are generally necessary for commercial mining activities. It is not expected that the implementation of either of the alternatives for this project would have significant additional impacts to watershed resources as caused by mining activities.

5. Agencies and Persons Consulted

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

Federal, State, and Local Agencies:

US Fish and Wildlife Service; National Park Service; Bureau of Land Management; US Senator's Office; Arizona Department of Environmental Quality; Arizona Game and Fish Department; Cochise County Board of Supervisors; Santa Cruz County Board of Supervisors; Sierra Vista Environmental Affairs Commission; US Army, Ft Huachuca; Natural Resource Conservation District, Hereford District; City of Benson, Arizona

Tribes:

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

Others:

Sierra Club; Center for Biological Diversity; The Nature Conservancy; Audubon Society; The Sky Island Alliance; Arizona Trail Association; Western Watersheds Project; Trail Riders of Southern Arizona

This proposal was first listed on the Coronado National Forest's Schedule of Proposed Actions in June 2018 and updated periodically during the analysis. Project information is available at http://www.fs.fed.us/nepa/nepa_project_exp.php?project=54149.

On June 28, 2018, a letter announcing the official scoping period for this project was sent to approximately 150 individuals and organizations, including State and local land management agencies, Tribal leaders, range permittees, and other interested parties. On June 29, 2018, a legal notice announcing the start of the 30-day scoping period was published in the *Sierra Vista Herald*.

The interdisciplinary team reviewed the four comment letters (two from the public, two from Tribes) received during the scoping period to determine if any alternatives were recommended or if any comments constituted issues with the proposed action. No site-specific issues with the proposed action were identified. General comments or concerns about the proposal included: effects to rangeland resources; collaboration with ranchers and tribes; and effects to wildlife, recreation users and hunters. These concerns are addressed as appropriate in the "Environmental Impacts of the Proposed Action and Alternatives" section. No commenters suggested alternatives to the proposed action.

On September 18, 2019, a legal notice announcing the start of the 30-day comment period was published in the *Sierra Vista Herald*. A letter announcing the formal opportunity to comment was sent to approximately 250 individuals; six comment letters (three from the public, three from Tribes) were received during the comment period. During the comment period, concerns were raised over the effects to water quality and quantity, riparian areas, wildlife and associated habitat, cultural resources, as well as cumulative impacts related to climate change and activities outside

of the project area. Commenters also raised concerns over elements of the proposed action related to rangeland management, such as utilization levels and trespass livestock. To address these concerns, the Forest Service responded in the following ways: 1) supplemented, improved, or modified the analyses; 2) considered literature/science; 3) made factual corrections; or 4) considered comments but determined no changes were needed.

In response to a comment letter submitted by the Arizona Department of Environmental Quality (ADEQ), the Forest Hydrologist and range staff conducted a site visit with ADEQ on March 3, 2020, to discuss impacts of the project. The Forest specialists reviewed field conditions with ADEQ, identified areas of mutual agreement regarding areas of concern, and worked to establish a mutual understanding of the project.

In consideration of comments received, the proposed action was modified to include further explanation of grazing management techniques, along with additional analysis and project design features intended to further mitigate any potential unintended effects of project activities. One commenter suggested an alternative to the proposed action that would include a reduction of livestock numbers. The interdisciplinary team determined that an alternative that would reduce livestock numbers would not meet the purpose and need of the proposed action.

Effects to the human environment from these modifications are not expected to differ from those disclosed for the proposed action in the draft EA. These concerns are addressed as appropriate in the “Proposed Action and Alternatives” and “Environmental Impacts of the Proposed Action and Alternatives” sections. All substantive comments received during the designated comment period were considered before reaching a decision.

Appendix A – Maps

These GIS products were compiled from various sources and may be corrected, updated, modified, or replaced at any time. For specific data source dates and/or additional digital information, contact the Forest GIS Coordinator, Coronado National Forest, Arizona and New Mexico.

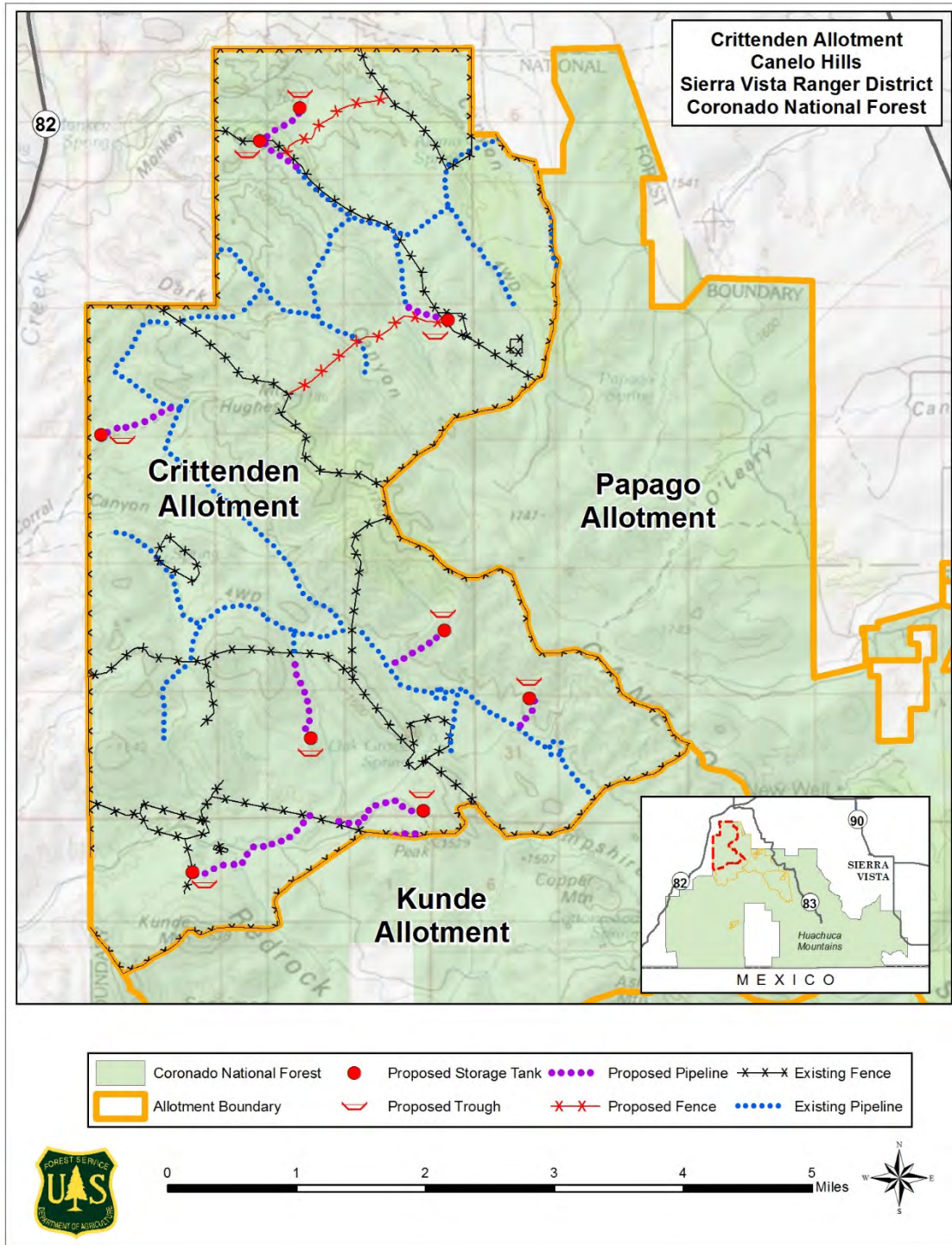


Figure 2. Crittenden Allotment proposed improvements

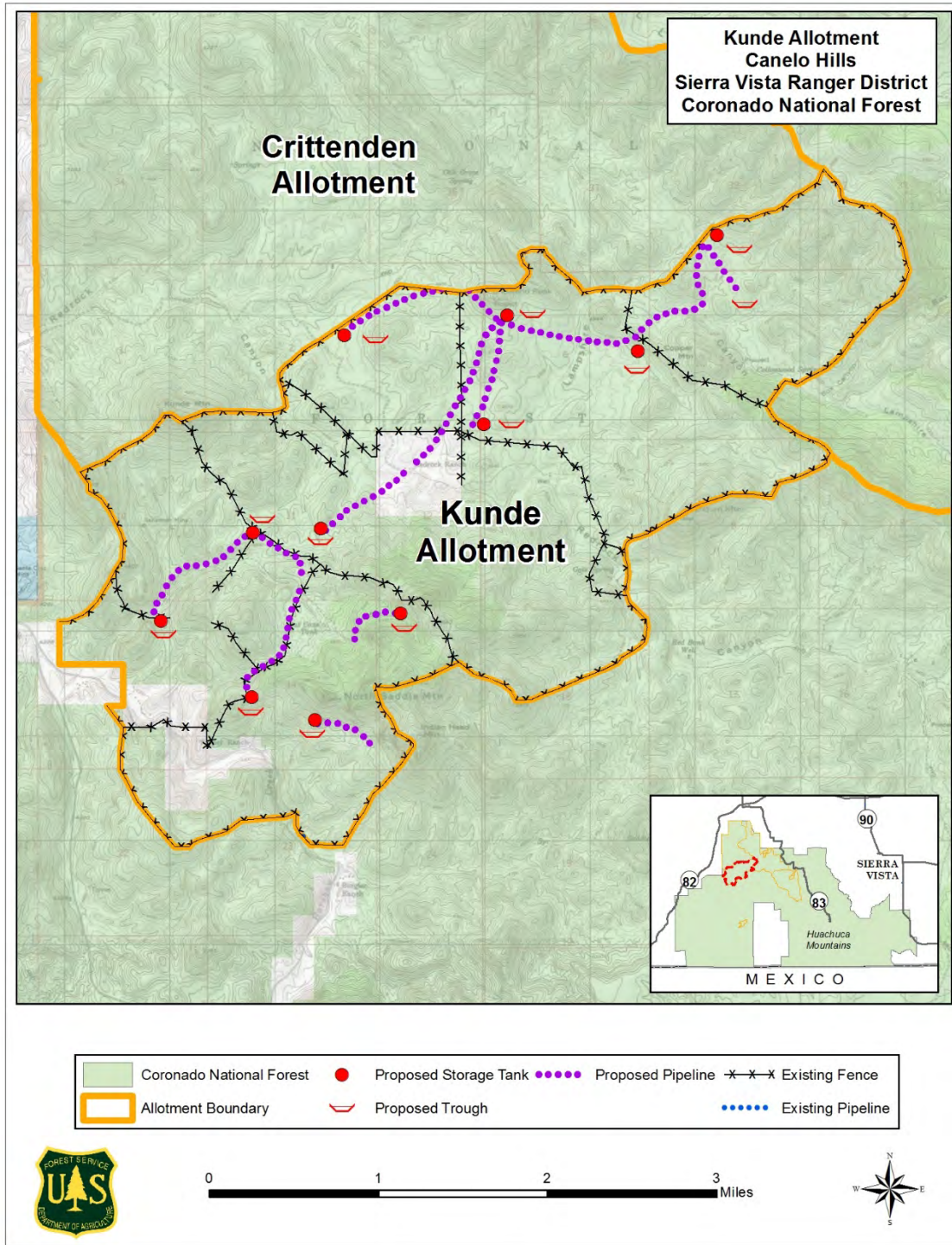


Figure 3. Kunde Allotment proposed improvements

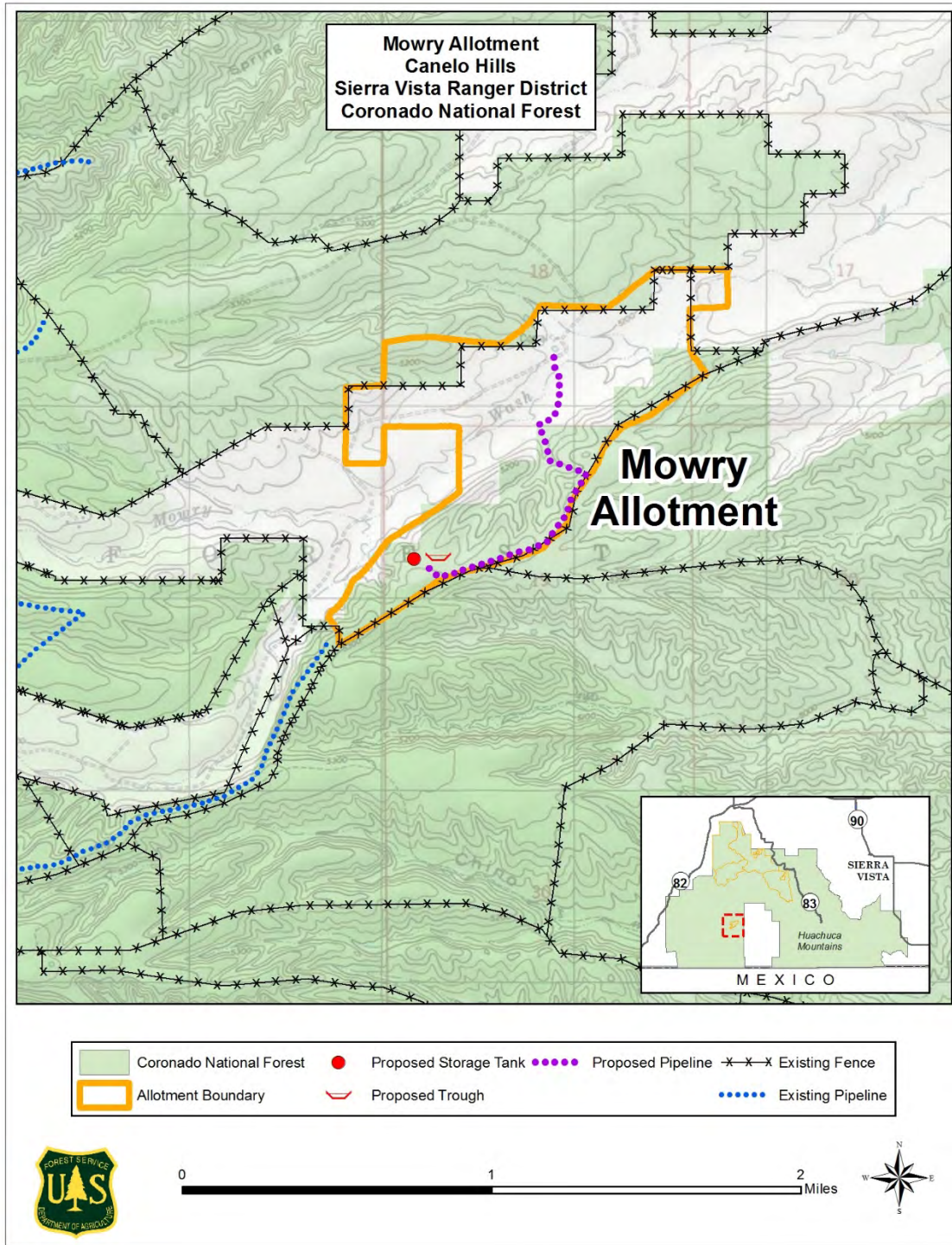


Figure 4. Mowry Allotment proposed improvements

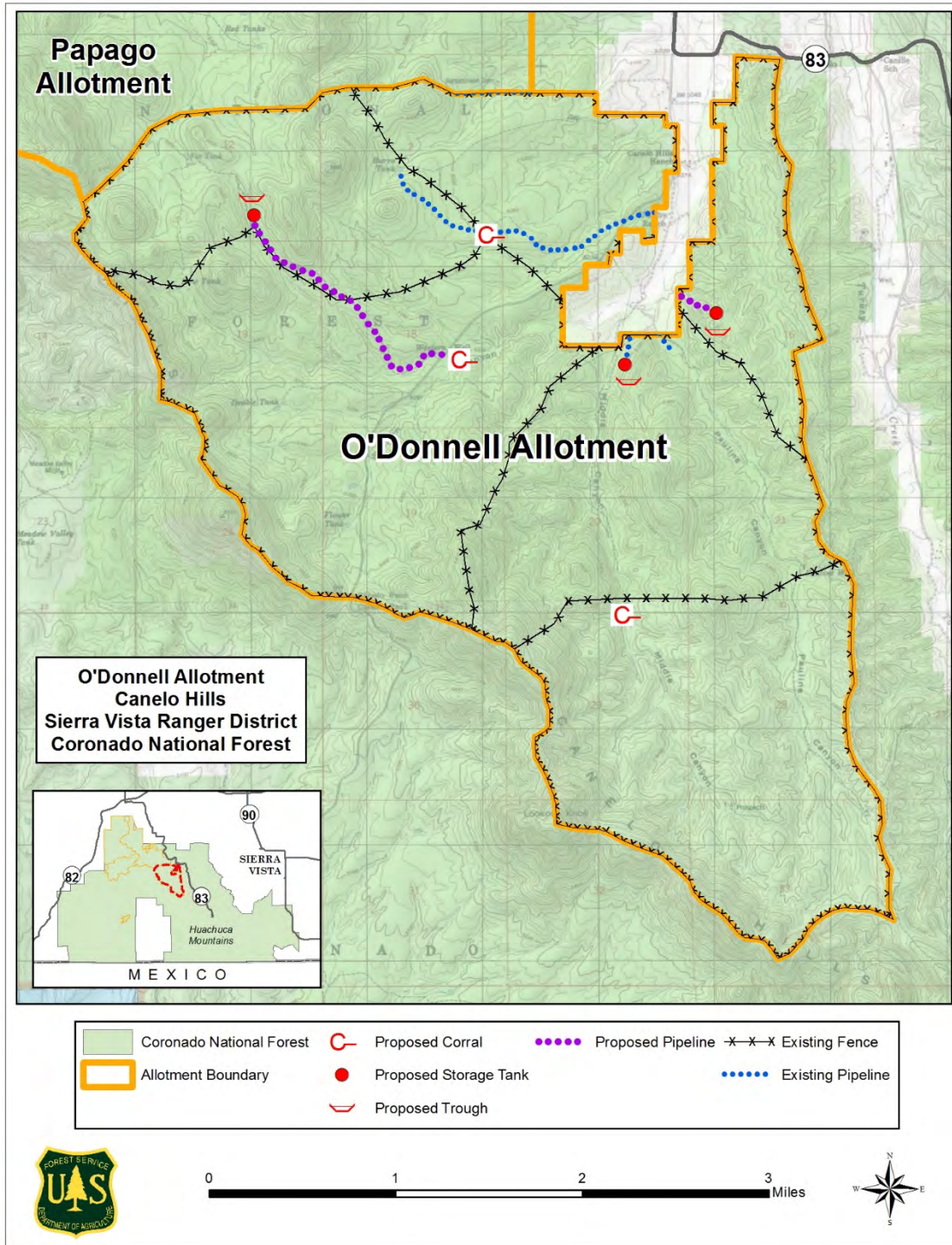


Figure 5. O'Donnell Allotment proposed improvements

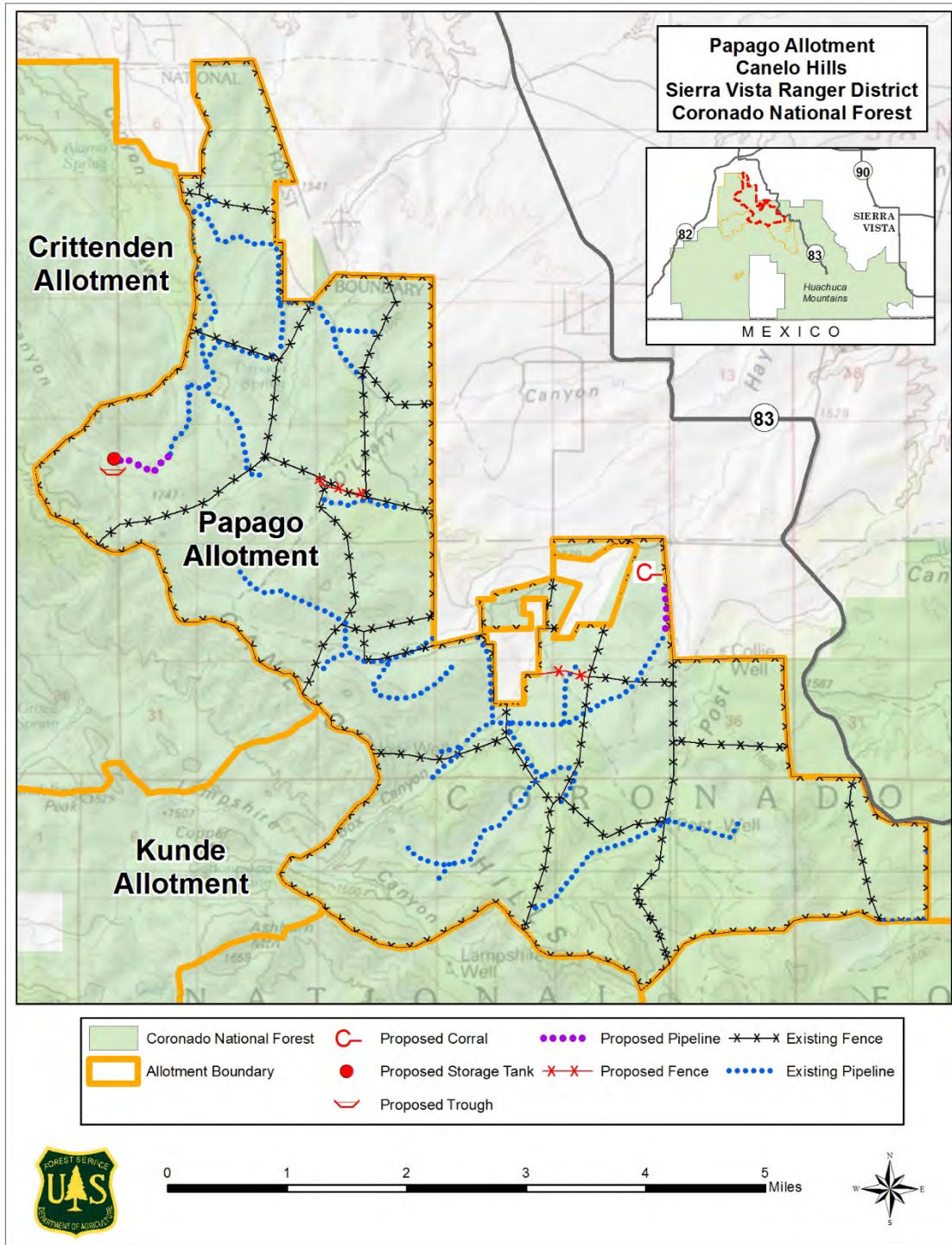


Figure 6. Papago Allotment proposed improvements