



United States Department of Agriculture  
Forest Service

# **Wildbunch Allotment Management Plan (AMP)**

## **Environmental Assessment**

Clifton Ranger District, Apache-Sitgreaves National Forests, Greenlee County, AZ  
July 2018

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# Chapter 1: Purpose and Need for Action

## Project Area Description

The Wildbunch Allotment consists of 23,027 acres of National Forest System land in Greenlee County, Arizona. The allotment is currently divided into eight pastures with authorized livestock use and one pasture from which livestock are excluded, along the Blue River corridor and associated riparian areas. The Wildbunch Allotment is located on the Clifton Ranger District of the Apache-Sitgreaves National Forests and represents the project area for this environmental analysis. The project area is bounded by the Sandrock Allotment to the north, the Copperas Allotment to the east, the Pleasant Valley and Hickey Allotments to the south, and the Pigeon Allotment to the west (See figures 1 and 2 below).

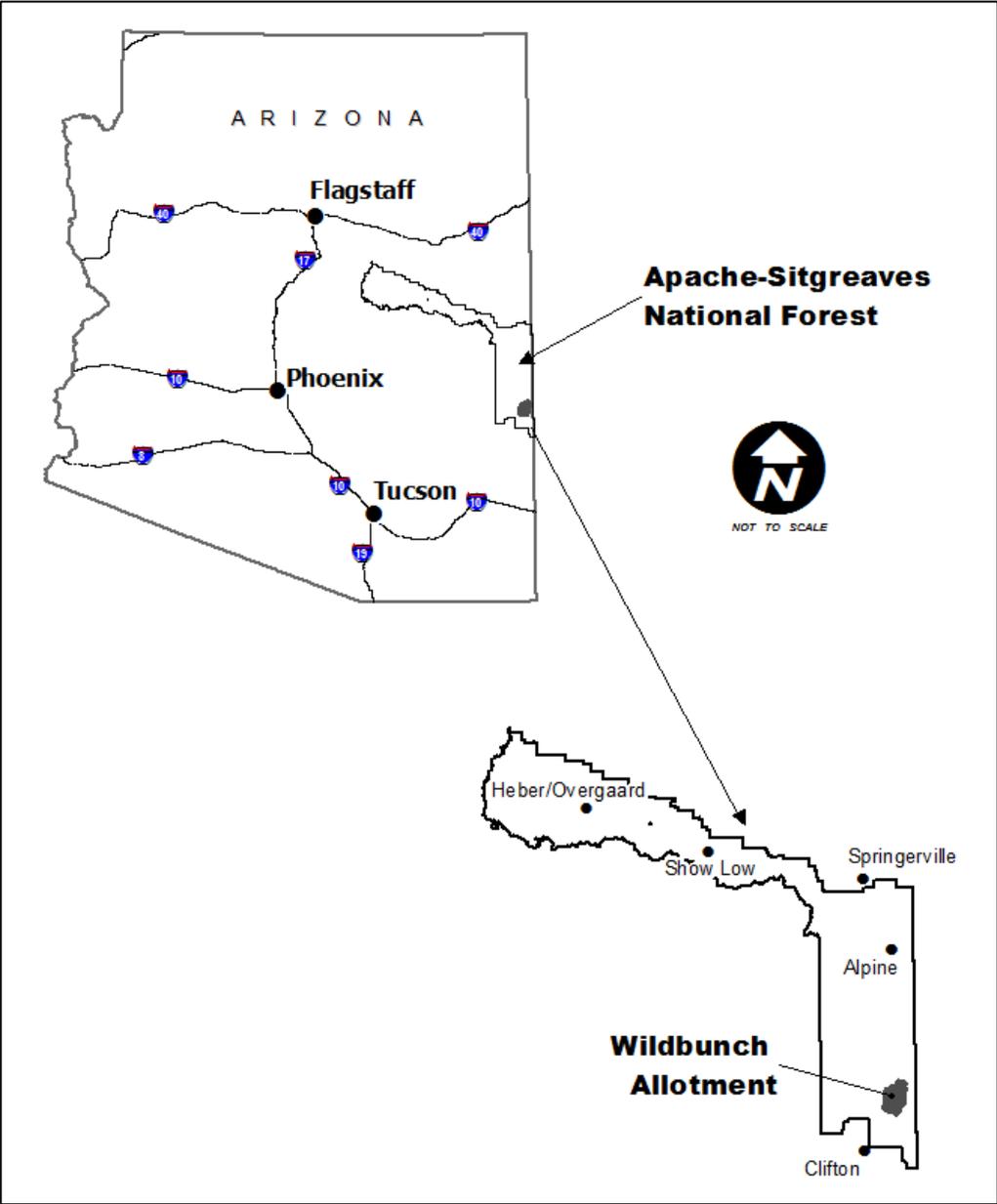


Figure 1: Proposed Project Location

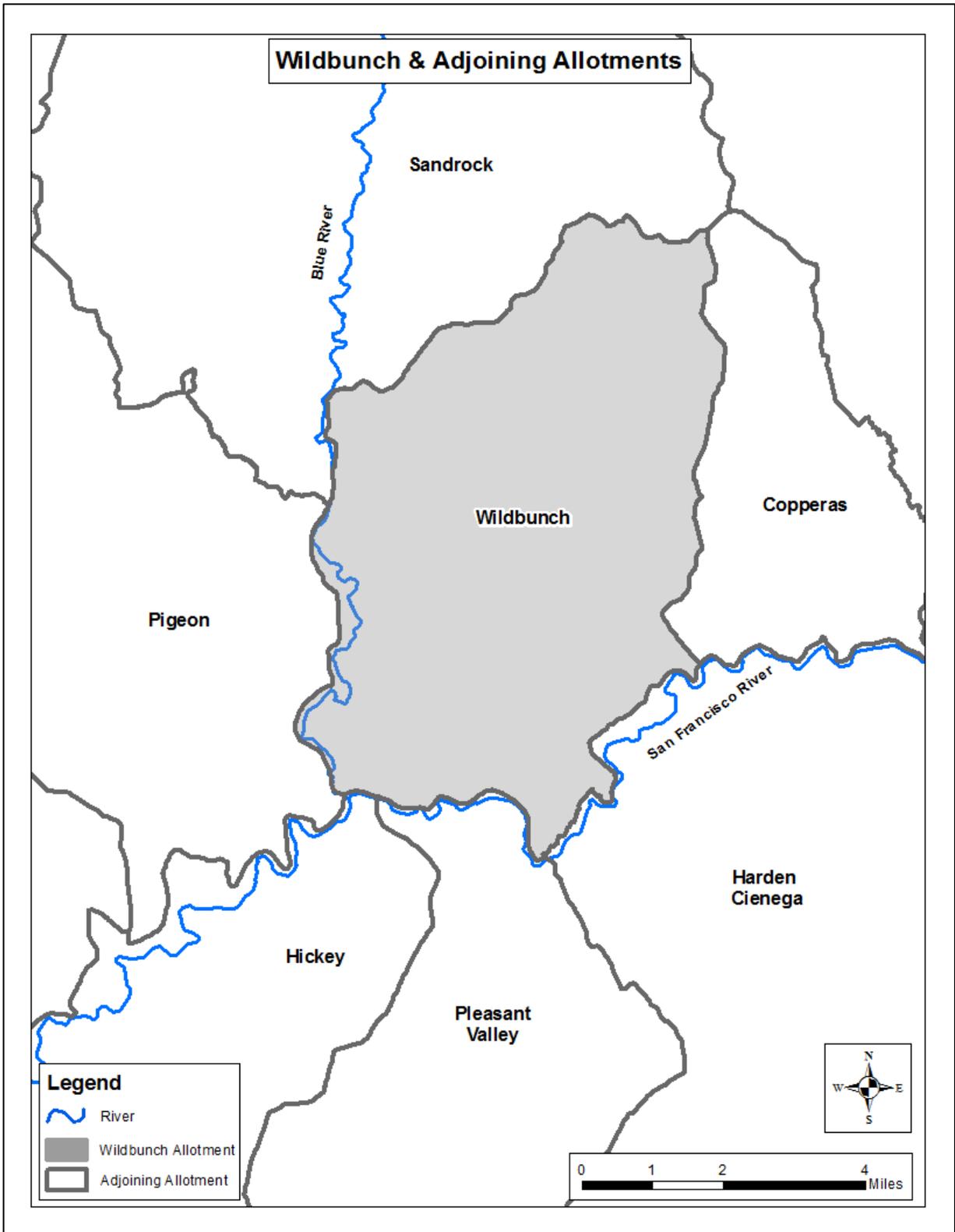


Figure 2: Wildbunch Proximity Map

# Existing Conditions by Resource

Existing conditions describe the current management situation and environmental conditions within the project area. Existing conditions provide a basis for comparison with desired conditions and in turn generate the purpose and need for action. The rangeland management decision-making guidance found in Forest Service Handbook 2209.13, Chapter 90, section 92.22, states that the purpose and need for the Proposed Action is based on the gaps between desired resource conditions and existing resource conditions.

## Existing Conditions- Range Vegetation

The Wildbunch Allotment is comprised of eight pastures with pinyon-juniper woodland and semi-desert grassland as the predominant vegetation types. The allotment consists of several large flat mesas and bottom lands that are separated by deep canyons and gullies. The allotment rises from flat rolling hills on the south end to deep canyons and higher elevation country on the north end. Elevation within the allotment boundary varies from approximately 4,300 feet to 8,080 feet, with the majority between 5,000 to 6,000 feet in elevation. There are five distinct potential natural vegetation types (PNVT) on the Wildbunch Allotment: Madrean Pine-Oak Woodland, Semi-desert Grassland, Interior Chaparral, Mixed Broadleaf Deciduous Riparian Forest and Ponderosa Pine Forest, listed here in descending order of abundance.

The Terrestrial Ecosystem Survey of the Apache-Sitgreaves National Forests provided the basis for describing the current vegetative condition on the Wildbunch Allotment. For this project the similarity between the existing plant community and the potential plant community was calculated by comparing the percent composition of the different growth forms (trees, shrubs, forbs, and grasses). Similarity to the potential plant community is categorized as High (67 -100%), Mid (34 – 66%) or Low (0 – 33%). Vegetative ground cover is the combination of vegetation and litter cover, and is expressed as the percent cover at each site. Range trend is determined by comparing the composition of the current plant composition and the current ground cover with that of the legacy data. This comparison provides data we can use to determine if a site is moving towards, remaining static or moving away from desired conditions. Rangeland management status (RMS) is defined in the R3 Rangeland Analysis and Management Training Guide (USDA-FS 2013) as a determination of the relative success of rangeland management through desired vegetation status and trend.

Table 1 below summarizes the resource indicators that are analyzed in this analysis and that provide the basis for assessing range condition in the Environmental Assessment.

**Table 1: Range Condition Measures**

Resource Element	Resource Indicator	Measure	Existing Condition
Rangeland vegetation	Rangeland management status (RMS)	Satisfactory or not satisfactory	Unsatisfactory on two sites in the western portion of the South pasture, one site in the Horse pasture, and one site in the Little pasture; all other sites are satisfactory
	Vegetative ground cover	Percent vegetative ground cover – meeting potential or not	Below potential on two sites, meeting potential on all others for which there is current data.
Livestock grazing management	Authorized livestock use	Potential to affect livestock operation, including number of head and grazing system	See below.

## Analyzed Terrestrial Ecosystem Unit Descriptions

Table 2 below, displays brief summaries of existing range conditions and potential vegetative ground cover (VGC) across the TEUs analyzed in the respective pastures found on the Wildbunch Allotment. VGC is a range from the minimum amount of basal vegetation and litter needed to maintain site productivity, up to the maximum amount of basal vegetation and litter one would expect to see at climax conditions. More completed descriptions of range trend and VGC, including pasture-by-pasture analyses, can be found in the Range Specialist report in the project record.

**Table 2: Summary of Existing Range Conditions with comparison to Potential VGC**

TEU	Range Trend	Similarity to desired vegetation	Rangeland Management Status	Potential Vegetative Ground Cover (%)	Current Vegetative Ground Cover (%)
<b>Western portion of South pasture</b>					
379	Away from	Low	Unsatisfactory	10-15	9 – below potential
469	Toward	High	Satisfactory	20-45	38 – meeting potential
470	Away from	Low	Unsatisfactory	15-60	18 – below potential
<b>Eastern portion of South pasture</b>					
379	Static	Mid	Satisfactory	10-15	27 – meeting potential
480	Toward	High	Satisfactory	10-30	25 – meeting potential
<b>Mud Springs pasture</b>					
632	Static	Mid	Satisfactory	25-30	29 – meeting potential
<b>Roan Cow pasture</b>					
632	Toward	Mid	Satisfactory	25-30	28 – meeting potential
<b>Indian/Oak pasture</b>					
432	Toward	Mid	Satisfactory	25-30	33 – meeting potential
<b>North/Joe Fritz pasture</b>					
130	Static	Mid	Satisfactory	5-30	
<b>Horse pasture</b>					
379	Static	Low	Unsatisfactory	10-15	
<b>Little pasture</b>					
469	Static	Low	Unsatisfactory	20-45	

## Existing Conditions- Livestock Grazing Management

From 2004 through 2018, livestock numbers have varied between 225 head and 188 head. Adjustments in numbers occurred due to environmental factors, such as drought. The South and Indian/Oak pastures have been grazed every year while the Roan Cow, Mud Springs, North, and Joe Fritz pasture are on a deferred-rest rotation schedule. The Little pasture has been restricted from use, except in 2009 and 2011, while the Blue River pasture has been excluded from use since 1994.

A number of range improvements exist on the allotment. These include 1 cabin, 10 corrals, 32 stock tanks, 3 water storage tanks, 1 trick tank, 27 miles of fence, and 8 miles of water pipeline. In addition to the eight pastures, there are five traps (small fenced areas for gathering and moving livestock).

## Existing Conditions- Soils

For soils, the existing condition of the resource is evaluated and assigned one of three soil condition categories, which serve as a reflection of soil function. Soil condition categories reflect soil disturbances resulting from both planned and unplanned events. These categories are defined as:

- **Satisfactory** – The soil indicators (hydrologic function, soil stability, and nutrient cycling) signify that soil function is being sustained and the soil is functioning properly and normally. The ability of the soil to maintain resource values and sustain outputs is high.
- **Impaired** – The ability of soil to function properly has been reduced and/or there exists an increased vulnerability to degradation. An impaired category should signal land managers that there is a need to further investigate the ecosystem to determine causes and degrees of decline in soil functions. Changes in management practices or other preventative actions may be appropriate.
- **Unsatisfactory** - Indicators signify that loss of soil function has occurred. Degradation of vital soil functions result in the inability of soil to maintain resource values, sustain outputs, and recover from impacts. Soils rated in the unsatisfactory category are candidates for improved management practices or restoration designed to recover soil functions.
- **Unsuited (Inherently Unstable)** - Soils within this classification include soils that are inherently unstable and/or unstable due to past activities of man. These soils are classified as “no allowable capacity” soils and considered untreatable with respect to livestock grazing. All areas with slopes greater than 40% are classified in this category in this analysis.

Table 3 below provides an overview of the current soil condition classes present on the allotment. This table is arranged by Terrestrial Ecosystem Survey map units (TEU), and sorted in descending order from the TES units that represent the largest percentage of the project area.

**Table 3: Acreage and Proportional Extent of Soil Condition Class by TES Mapping Unit for Wildbunch Allotment, arranged by proportion of allotment.**

TEU	Acres	% of the Allotment	Current Soil Condition Class
412	6081	26.4	Satisfactory
220	3614	15.7	Unsuited/Inherently Unstable
130	2853	12.4	Unsuited/Inherently Unstable
612	1906	8.3	Unsuited/Inherently Unstable
379	1319	5.7	Impaired
612	1188	5.1	Satisfactory
432	923	4	Impaired
470	900	3.9	Unsuited/Inherently Unstable
130	824	3.6	Unsatisfactory
480	717	3.1	Satisfactory
469	579	2.5	Unsatisfactory
632	562	2.4	Impaired
618	357	1.5	Impaired
732	354	1.5	Unsuited/Inherently Unstable
102	298	1.3	Satisfactory
512	304	1.3	Unsuited/Inherently Unstable
573	144	0.6	Satisfactory
224	118	0.5	Unsuited/Inherently Unstable
628	30	0.1	Unsatisfactory

Overall, soil condition is generally satisfactory in areas that were not grazed heavily and less than satisfactory in areas where livestock have concentrated use. For more information pertaining to how soil condition is assigned, see the *soils- affected environment* section of the soil and watershed specialist report in the project record. Hydrologic function is reduced in unsatisfactory or impaired condition areas due primarily to reductions in pore space from raindrop impact and compaction from ungulates. Soil loss from sheet and rill erosion is currently above tolerance levels in some of these locations, and there is evidence of accelerated overland flow associated with steeper slopes.

Biological soil crusts are found on the soil surface within the allotment as well. These consist of a crust of soil particles bound together by organic materials. Biological soil crusts have been shown to be susceptible to degradation through a variety of disturbances, such as fire and trampling, and may require lengthy periods in which to recover from such disturbances (Belnap, et al 2001). Within the Wildbunch Allotment, areas exist where ungulates concentrate and plant and crust density are low.

## Existing Conditions- Watersheds and Riparian Areas

The Wildbunch Allotment project area is drained by a number of intermittent and ephemeral streams and washes as well as perennial and perennial interrupted streams that flow into the Blue River and San Francisco River. The intermittent and ephemeral streams on the allotment are characterized as having steep gradients with rapid flows that contribute to relatively unstable streambed conditions. These high flows are endemic to the region and result primarily from high intensity (monsoonal) summer thunderstorms coupled with steep, rugged terrain, shallow local soils, and areas of less-than-satisfactory watershed conditions. Of the total allotment acreage, 15,789 acres are located in the *Lower Blue River 5<sup>th</sup>* hydrologic unit code (HUC) watershed, and the remaining 7,281 acres are located in the *Mule Creek - San Francisco 5<sup>th</sup>* code watershed.

The Forest Service uses three classes to describe watershed condition in accordance with FSM 2521.

- Class 1 watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential.
- Class 2 watersheds exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential.
- Class 3 watersheds exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential.

The subwatersheds (6<sup>th</sup> Level Hydrologic Unit Code) across the Apache-Sitgreaves National Forests are classified as being in one of the three condition classes noted above, translated to three classes of function.

- Class 1 = Functioning Properly,
- Class 2 = Functioning at Risk, and
- Class 3 = Impaired Function.

The Wildbunch Allotment is located within three subwatersheds: *Alder Creek-Blue River*, *Cienega Creek-Blue River* and *Coalson Creek-San Francisco River*. These three sub-watersheds are all classed as “Functioning at Risk” for National Forest System lands. Table 4, below, provides the percentage of the allotment found in these watersheds, and the Watershed Condition Classification Rating for each. A discussion of these indicators occurs within the “Cumulative Effects Analysis, Watershed, for the Wildbunch Allotment” found in the project record.

**Table 4: Acreage and Proportional Extent and Watershed Condition Classification of the Wildbunch Allotment within the Affected 5th and 6th Level Hydrologic Unit Code watersheds.**

5 <sup>th</sup> Level HUC Name	6 <sup>th</sup> Level HUC Name	Total 5 <sup>th</sup> Level HUC Acres	Total 6 <sup>th</sup> Level HUC Acres	Wildbunch Allotment Acres	Proportional Extent	Watershed Condition Classification Rating 6 <sup>th</sup> Level HUC
Lower Blue River	Alder Creek-Blue River		31,153	7,189	23%	Class 2 – Functioning at Risk
	Cienega Creek -Blue River		14,694	8,553	58%	Class 2 – Functioning at Risk
		198,105		15,742	8%	
Mule Creek - San Francisco River	Coalson Creek-San Francisco River		19389	7,293	38%	Class 2 – Functioning at Risk
		244,422		7,293	3%	

### Riparian Area Existing Conditions

The conditions of specific riparian reaches within the allotment were analyzed in the environmental analysis process. These are delineated in summary form below, listed by stream and describing which reaches of the stream were assessed and the PFC ratings of the assessed reaches.

Similar to watersheds, riparian areas are rated into three categories:

- PFC = Functioning Properly,
- FAR = Functioning at Risk, and
- NF = Not Functioning.

#### *Cienega Creek*

**Extent Assessed:** From the mouth of the creek at the Blue River, followed upstream a distance of approximately 5 miles, with four reaches described for Cienega Creek.

**PFC Rating:** Extreme lowest and highest reaches in canyon were rated PFC (total 2.5mi), while in between these reaches, one was ranked NF (2mi) and one was FAR (0.5mi).

#### *Mud Springs Canyon*

**Extent Assessed:** From the 475 road (Juan Miller Road), upstream approximately 2 miles, and downstream about 0.5 miles.

**PFC Rating:** The entire 2.5mi segment assessed was rated NF.

#### *Wild Bunch Canyon*

**Extent Assessed:** From the 475 road (Juan Miller Road) upstream approximately 2.25 miles to top of watershed, and downstream about 0.5 miles. Two reaches were described in this survey.

**PFC Rating:** Lower reach 0.5mi NF, upper 2.25mi reach was rated PFC.

#### *Lower Blue River*

**Extent Assessed:** From FR 475 (Juan Miller Road) at Stacey crossing downstream approximately 8 miles to the confluence with the San Francisco River. One reach was described in this survey.

**PFC Rating:** FAR over the whole reach (8mi).

### *Blue River - National Riparian Service Team Assessment:*

The entire length of the Blue River was assessed as one uniform reach in FAR with an upward-trending condition.

### *San Francisco River*

**Extent Assessed:** From the western most edge of the Forest boundary where the San Francisco leaves the Forest lands, upstream to the confluence with the Blue River. Four reaches were described in this survey.

**PFC Rating:** The 4 reaches described along this segment of river, 2 were rated FAR and 2 were rated NF. In reviewing the descriptions, all could have been averaged as FAR.

## Existing Conditions- Socioeconomics

Social and economic conditions that exist in the project area are considered in this analysis in terms of quantitative and qualitative factors relating to agricultural employment and impacts of livestock grazing on the economy of the surrounding area, the closest unit of analysis being Greenlee County, Arizona. For socioeconomics, the conditions considered include the makeup of the labor market in the affected environment, the agricultural component of the local economy, and the makeup of the land-ownership base, land uses, and federal land-use payments in the affected environment.

Data compiled by Headwaters Economics indicates that agricultural jobs comprise 3.75% of the total employment of Greenlee County, while “non-farm” employment represent the remaining 96.3% of employment in the county (Headwaters Economics, 2018a). Both income and percentage of jobs related to agriculture are higher in Greenlee County than the US at large. Further, Greenlee County has indicators of relatively strong agricultural component in the local economy.

Within Greenlee County, 63.4% of the land base is USFS land. In areas like Greenlee County, where a large portion of land is owned and managed by federal agencies, local governments may rely heavily on Payments in Lieu of Taxes and revenue sharing payments, e.g., Forest Service Secure Rural Schools and Community Self-Determination Act or BLM Taylor Grazing Act payments. (Headwaters Economics. 2018c).

Grazing receipts also generate revenue for local governments. In the 2017 data, federal land payments to Greenlee County totaled \$1,682,965 – 51% of this figure, or \$865,590, came from Payment In Lieu of Taxes or PILT, while \$790,157 or 47% came from Forest Service payments. The remainder, 1.7%, came from other BLM payments. Payments are funded by federal appropriations and from receipts received by federal agencies from activities on federal public lands (Headwaters Economics, 2018c).

## Existing Conditions- Cultural Resources

Seven heritage resource inventories have been completed within the allotment. Across these resource inventories, a total of 747 acres of the allotment have been surveyed. The Wildbunch AMP survey was conducted to examine proposed range improvements that were identified in 2011 for the Wildbunch Allotment. A total of 17 sites were previously recorded in the allotment. This includes a variety of archaeological site types, including field houses ranging from 2 to 4 rooms, lithic and artifact scatters, pit-houses, and sites associated with caves or alcoves. The three academic research projects have all noted archaeological sites along the Blue and San Francisco river corridors. This suggests a potential for additional, unrecorded sites in the project area, particularly in proximity to the western and southern boundaries of the project area, formed by the Blue and San Francisco Rivers.

## Desired Conditions by Resource

Desired conditions describe the goals for the various resource areas as this project is implemented, and are defined by guidance from the 2015 Apache Sitgreaves National Forests' Land Management Plan (hereafter, forest plan) and the best available scientific information provided from Forest Service resource specialists. These desired conditions are presented here in summary form to give an overview of how they drive the purpose and need for this project, in accordance with rangeland management decision-making guidance found in Forest Service Handbook 2209.13, Chapter 90, section 92.22, which states that the purpose and need for the Proposed Action is generated by the gaps between desired resource conditions and existing conditions. Further documentation of desired conditions can be found in the specialist reports for the various resources, located in the project record.

### Desired Conditions- Range Vegetation

- Satisfactory Rangeland Management Status (RMS) with a static or upward apparent trend.
- Livestock grazing and associated activities occur such that healthy, diverse plant communities, satisfactory condition soils, and wildlife habitat are maintained or improved.
- Structural improvements made are flexible to enhance management control and allow for effective distribution of forage use.
- Livestock grazing is in balance with available forage.

### Desired Conditions- Livestock Grazing

- Livestock grazing contributes to the social, economic, and cultural diversity and stability of rural communities.
- Grazing operations are responsive to changing climatic or environmental conditions.

### Desired Conditions- Soils, Watersheds, Riparian Areas

- Soil and watershed conditions are satisfactory or approaching satisfactory within 10 years of implementation on capable and potentially capable rangeland. The percent of vegetative ground cover (plant basal area, litter, and biological soil crust) are at least at a level to prevent accelerated soil loss (at or above tolerance) as described in the Terrestrial Ecosystem Survey for the Apache-Sitgreaves National Forests. Ground cover levels on non-capable range are at its maximum natural potential to minimize sediment production as described in the TES.
- Ecological and hydrologic functions are not impaired by soil compaction.
- Soils are stable within their natural capability. Vegetation and litter limit accelerated erosion (e.g. rills, gullies, root exposure, topsoil loss) and contribute to soil deposition and development.
- Soils provide for diverse native plant species. Vegetative ground cover (herbaceous vegetation and litter) is distributed evenly across the soil surface to promote nutrient cycling, water infiltration, and maintain natural fire regimes.
- Biological soil crusts (e.g. mosses, lichens, algae, liverworts) are present and re-established if potential exists.
- Like soils, the desired condition for watersheds in the project area is that these resources are classified as satisfactory or approaching satisfactory in the long term on capable and potentially capable rangeland.
- Water resource conditions meet state water quality objectives.
- Water quantity meets the needs for forest administration and authorized activities.

- Riparian systems are fully functional, supported by herbaceous and multi-age woody vegetation, within site potential, that provides for stable stream channels and banks and habitat for riparian-dependent plants and animals.
- Flooding should not disrupt normal stream characteristics or alter stream dimensions.
- Floodplains are functioning and lessen the downstream effects of floods on human safety, health, and welfare.

### Desired Conditions- Cultural Resources

- Important historic and cultural sites are protected and preserved from adverse impacts.
- Projects should be managed in such a manner that ensures a determination of either "No Historic Properties Affected" or "No Adverse Effect" to heritage resources.

### Desired Conditions- Wildlife and Aquatics

- Maintain or enhance suitable habitats for threatened and endangered species, and Forest Service sensitive species.
- Water developments should contribute to fish, wildlife, and riparian habitat as well as scenic and aesthetic values.
- Streamflows, habitat, and water quality support native aquatic and riparian-dependent species and habitat.
- Habitat and ecological conditions are capable of providing for self-sustaining populations of native, riparian dependent plant and animal species.

### Desired Conditions- Socioeconomics

- Livestock grazing continues to contribute to the social, economic, and cultural diversity and stability of rural communities.

## Gaps between Existing and Desired Conditions

- Vegetative Species Composition: There are portions of the allotment within certain TEUs, identified in the existing conditions above, which need improvements in vegetative composition and density in order to meet the goal of satisfactory Rangeland Management Status.
- Riparian & Aquatic Condition: Not all riparian resources are in proper functioning condition. Some riparian systems may remain at risk as a function of past management activities and/or upstream management activities. This, in turn, has potential adverse impacts on the conditions of aquatic wildlife that rely on these habitats.
- Soil Conditions: In some specific areas of the allotments monitored with permanent or paced transects, the soil conditions are impaired. Desired condition is for minimum or better ground cover by soil type to reduce erosion rates on the allotment and to help meet potential for groundcover in certain TEUs that are currently below potential.
- Legal and Administrative Compliance: The Wildbunch Allotment needs environmental analysis conducted in accordance with the National Environmental Policy Act in order to comply with the Rangeland Rescission Act of 1995.

## Purpose and Need for Action

The purpose of this proposal is to consider livestock grazing opportunities on public lands identified as suitable, and to do so in a manner that moves a variety of resources towards the desired conditions and other objectives, standards, and guidelines set forth in the 2015 revised forest plan for the Apache-Sitgreaves National Forests. This proposal additionally is designed to consider necessary long-term management direction on grazing that would occur through an allotment management plan (AMP) and subsequent Annual Operating Instructions (AOIs) designed in accordance with the Proposed Action in this analysis.

Re-authorization is needed at this time on the Wildbunch Allotment because:

- Where consistent with other multiple use goals and objectives there is Congressional intent to allow grazing on suitable lands. (*Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976*).
- The Wildbunch Allotment contains lands identified as suitable for domestic livestock grazing in the forest plan, and continued domestic livestock grazing is consistent with the goals, objectives, standards, and guidelines of the forest plan, (pgs.23, 29, 34, 36. 96-99)
- It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans. (*FSM 2203.1; 36 CFR 222.2 (c)*).
- It is Forest Service policy to continue contributions to the economic and social wellbeing of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood. (*FSM 2202.1*) and such a policy is further stated as a desired condition in the revised 2015 forest plan.
- The Term Grazing Permit for the Wildbunch Allotment was issued to the present permittee in December 1994 and again in 2009, with environmental analysis not completed.
- Environmental analysis is needed in order to comply with the Rangeland Rescission Act of 1995.

## Apache-Sitgreaves Forest Plan Consistency

The Wildbunch Allotment contains lands identified as suitable for domestic livestock grazing in the revised 2015 forest plan. Further documentation detailing the project's consistency with the forest plan can be found in the project record as well as Appendix D of this document. The 2015 forest plan identified the Wildbunch Allotment as suitable for livestock grazing, see Figure 3 below for an overview of grazing suitability on the southern portion of the Clifton Ranger District, with the Wildbunch Allotment outlined and labeled within the portion of the forests designated as suitable. This map is based on data derived from the final environmental impact statement for the 2015 forest plan revision.

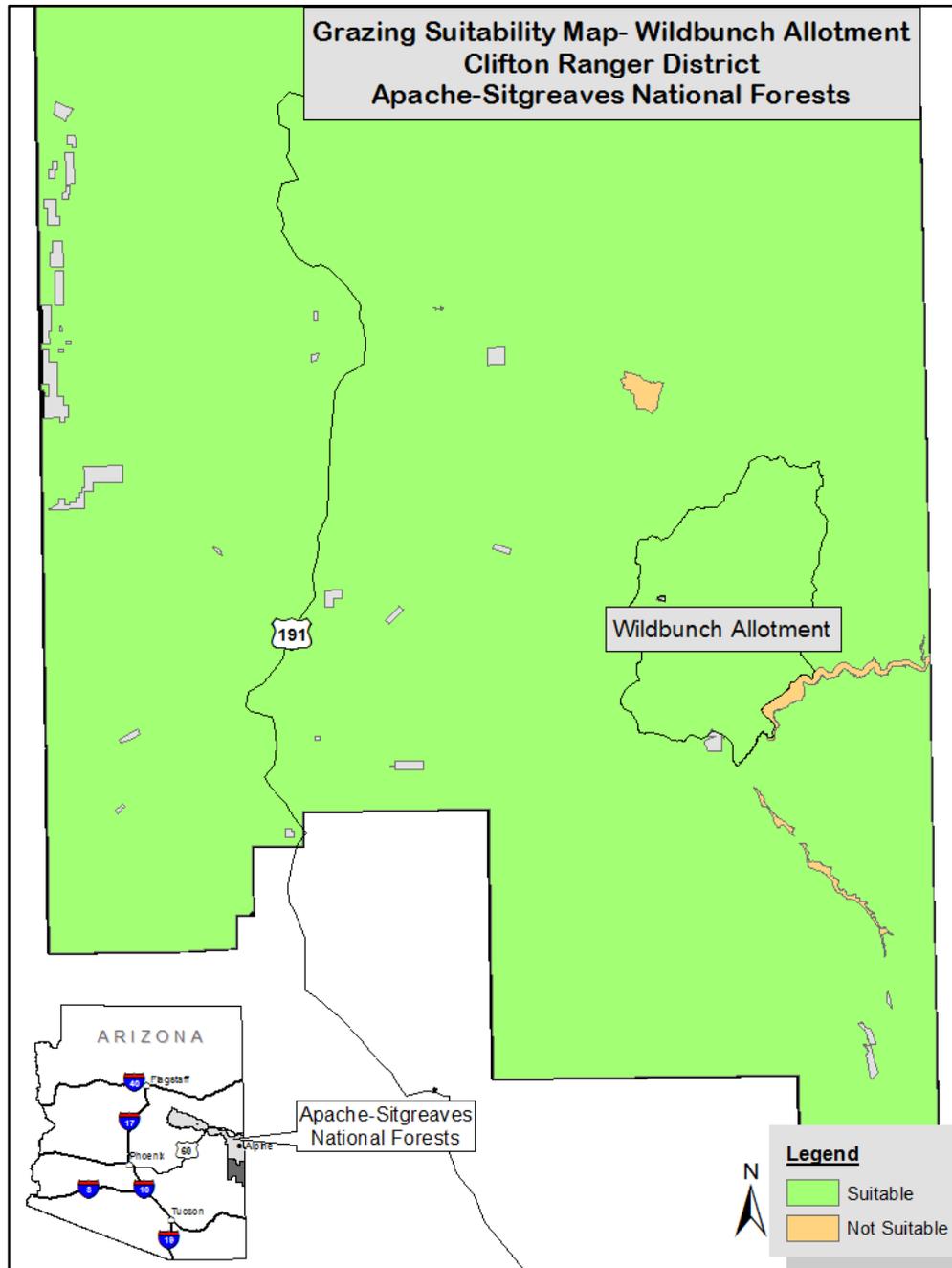


Figure 3: Grazing Suitability Map- Southern Portion of Clifton Ranger District

## Decision Framework

The district ranger of the Clifton Ranger District on the Apache-Sitgreaves National Forests is the responsible official for this project. The ranger will review the alternatives and the associated environmental consequences in order to make a decision. The decision should contain activities that best meet the purpose and need of the project, provide consistency with forest plan standards and guidelines for resources in the project area, and comply with applicable laws, regulations, and policies. The district ranger will decide whether to implement the Proposed Action as described or with modifications. The district ranger also could use this as the basis to develop an environmental impact statement, or to implement the no-grazing alternative.

## Public Involvement and Tribal Consultation

The proposal has been listed in the Apache-Sitgreaves National Forests' Schedule of Proposed Actions (SOPA) since 1995. The project has been on all quarterly SOPA updates since that time. The permittee was invited to participate in the planning of this project in March 1999.

In the course of the NEPA process, this environmental analysis has been scoped with the public twice, (in 2000 and 2004) and draft or preliminary assessments have been released to the public for comment twice (in 2006 and 2014). Between both scoping and comment processes, 27 letters have been received regarding this project within the allotted time frames for scoping and comment. In accordance with provisions of 36 CFR 220.7, this project and the proposed action have been developed incrementally, in order to address various concerns expressed by the public and permittee. The interdisciplinary team's work to respond to comments received during scoping and comment periods is documented in an appendix to this report as well as in a table of comments and responses located in the project record and on the Forest Service website at: <https://www.fs.usda.gov/project/?project=5636>.

Individuals or groups who responded to comment opportunities, or participated during these processes have standing to object to this project per 36 CFR 218. Initiation of a 45-day objection period on this EA and the draft decision document resulting from the analysis will be published in *The Copper Era* within the month of August, 2018.

## Issues

An issue is a point of discussion, debate, or dispute about the potential environmental effects of the proposed activities or alternatives. Issues are specific cause-effect relationships directly or indirectly caused by implementing the Proposed Action. Following our initial scoping processes (occurring in 2000 & 2004), we reviewed all comments received to determine how the comments related to the Proposed Actions, and whether or not a relevant issue was raised or the comment was already answered through existing law, regulation, or policy. Comments further provided a means to determine what resources and focus to include in the detailed analysis.

All relevant issues raised during the combined scoping process were considered by the interdisciplinary team when developing alternatives, mitigations/monitoring and environmental analyses for the current action on the Wildbunch Allotment. The issues raised in scoping that are addressed in the environmental analysis below include socioeconomic effects, rangeland improvements, and concerns about sensitive species and range vegetation conditions.

## Chapter 2: Proposed Action and Alternatives

This section provides an overview of considered alternatives that represent the choice options for the responsible official.

### Alternatives Considered, but Eliminated from Detailed Analysis

One alternative was considered, but eliminated from detailed analysis in this iteration of the EA – the continuation of current management. This alternative would have continued livestock grazing under the current management strategy that has been in place since 1994. This alternative was not carried forward for further analysis since it would not meet the purpose and need to improve livestock distribution across the allotment and to improve rangeland condition.

### Alternatives Considered in Detail

#### Alternative 1: No Grazing

The no action alternative or consideration of no grazing is required by Forest Service Handbook (FSH) 2209.13 Chapter 90. Under the no action alternative, livestock grazing on the Wildbunch Allotment would be discontinued and the term grazing permit would be cancelled after a 2-year notification to the permit holder (Forest Service Handbook 2209.13-16.24). Maintenance of existing range improvements normally assigned to the permit holder would no longer occur.

#### Alternative 2: Proposed Action

The Proposed Action consists of reissuing a grazing permit to meet the purpose and need defined in chapter one of this analysis. The Proposed Action includes adaptive management options to reach desired conditions in portions of the allotment. A monitoring plan has been developed for the allotment which includes implementation and effectiveness monitoring. The Proposed Action follows current guidance from Forest Service Handbook 2209.13, Chapter 90.

#### Grazing Permit

A 10-year term grazing permit would be issued, authorizing the following stocking ranges, rotations, season of use, and adaptive management criteria:

- *Stocking:*
  - 188 – 311 cow/calf pairs (from 3/1 – 2/28 annually)
  - 8 horses (from 3/1 – 2/28 annually)
  - 29 – 48 yearlings (from 1/1 to 5/31 annually)
  - 22 – 35 yearlings (from 1/1 – 10/31 annually).
- *Rotation:*
  - 8 pasture deferred rest rotation.
- *Season of Use:*
  - Year-long.
- Adjustments to the annual authorized livestock numbers (within the ranges listed in the permit) may occur during the grazing year, based on favorable conditions or may be adjusted downward if conditions are not favorable, such as in the case of drought, insects or other environmental factors. The maximum numbers would be allowed when desired conditions are met.

## Grazing Management

The South pasture would be administratively divided into two sections and called the Southwest and Southeast pastures (See Figure 3). Through herding, livestock would be encouraged to use the Southeast pasture to allow the Southwest pasture recovery time (currently portions in poor range condition). If herding proves to be ineffective other adaptive management would be implemented. If current poor range conditions persist in the Southwest pasture, livestock management would be modified through a change in livestock numbers, season of use, and/or duration of grazing.

North and Joe Fritz pastures would be administratively managed as one pasture called North/Joe Fritz. This would be an administrative change with no associated ground disturbing activities.

Little pasture would not be authorized for grazing, but would be allowed incidental use as livestock pass through moving between pastures.

Primary pastures encompass 21,801 acres (see table 5). Five small traps and three exclosures bring the total Wildbunch Allotment to 23,027 acres. Traps are small areas used for gathering and moving livestock from one pasture to another. Exclosures are areas excluded from grazing.

**Table 5: Pasture, acres, and percent of area in the Wildbunch Allotment under Proposed Action**

Pasture name	Acres	Percent of project area
Southwest	5,569	24.2%
Southeast	4,086	17.7%
Mud Springs	3,956	17.2%
Roan Cow	3,536	15.4%
Indian Oak	2,371	10.3%
North/Joe Fritz	1,402	6.1%
Horse	475	2.1%
Little	406	1.7%
Exclosures/Traps	1,226	5.3%
<b>Total</b>	<b>23,027</b>	<b>100.0%</b>

## Structural Range Improvements

Structural range improvements for the Wildbunch Allotment are designed to improve livestock distribution and water access. The proposed improvements are delineated below in table 6 by pasture. It is important to note that some of these are potential improvements proposed under certain circumstances in the adaptive management framework detailed later in this chapter, meaning that we are not proposing to construct them right away as part of the Proposed Action.

**Table 6: Proposed improvements**

<b>Pasture</b>	<b>Proposed Improvements</b>	<b>Description</b>	<b>Location</b>
Southwest	Big Tank Series Tank #1 Water-lot	¼ mile of fence around Big Tank Series Tank #1	T2S, R31E, SW ¼ of section 28
Southwest	Big Tank Series Tank #2 Water-lot	¼ mile of fence around Big Tank Series Tank #2	T2S, R31E, SW ¼ of section 28
Southwest	Big Tank Series Tank #3 Water-lot fence	¼ mile of fence around Big Tank Series Tank #3	T2S, R31E, SW ¼ of section 33
Southwest	5,000 gallon storage tank	Tank to store water for the existing drinker.	T2S, R31E, SW ¼ of section 21
Southeast	5,000 gallon storage tank	Tank to store water for the existing and proposed drinkers	T2S, R31E, Middle of section 15
Southeast	150-600 gallon trough	Drinking trough with shut off valves installed to help control distribution and use	T2S, R31E, Middle of section 15
Southeast	150-600 gallon trough	Drinking trough with shut off valves installed to help control distribution and use	T2S, R31E, NE ¼ of section 21
Southeast	1 mile extension of pipeline	1 mile of 1 ¼ inch black poly plastic pipe laid on top of ground.	From existing water tank at T2S, R31E, SW ¼ of section 22, traveling south to T2s, R31w, SW ¼ of section 27
Southeast	150-600 gallon trough	Drinking trough	T2S, R31E, SW ¼ of section 27
Southeast/west	Fence	4 miles of fence, dividing south pasture	From Cienega creek #2 corral at T2S, R31E, NW ¼ of section 15 traveling south along ridge top to T2s, R31w, SW ¼ of section 33

Little	Fence	0.88 miles of fence	T2S, R31E, SW ¼ of section 8 to and SW ¼ of section 7
Horse	Fence	1 mile of fence	From private land at T2S, R31E, SW ¼ of section 8 traveling southeast through T2s, R31w, NW ¼ of section 17 circling back to private land.
Mud Springs	Trick tank and trough	Trick tank and trough with less than a one-acre foot print), with a collection apron, storage tank, pipeline, and trough to collect and hold water, surrounded by up to 0.5 miles of fence. Livestock would use the new trick tanks during the growing seasons	T2S, R31E, Middle of section 15
Roan Cow	Trick tank and trough	Trick tank and trough with less than a one-acre foot print), with a collection apron, storage tank, pipeline, and trough to collect and hold water, surrounded by up to 0.5 miles of fence. Livestock would use the new trick tanks during the growing seasons	T1S, R31E, NE ¼ of section 34

See figure 4 below for a geographical overview of proposed improvements as well as the potential improvements proposed under the adaptive management framework and Figure 5 for an overview of the means by which livestock are excluded from grazing on the Blue River.

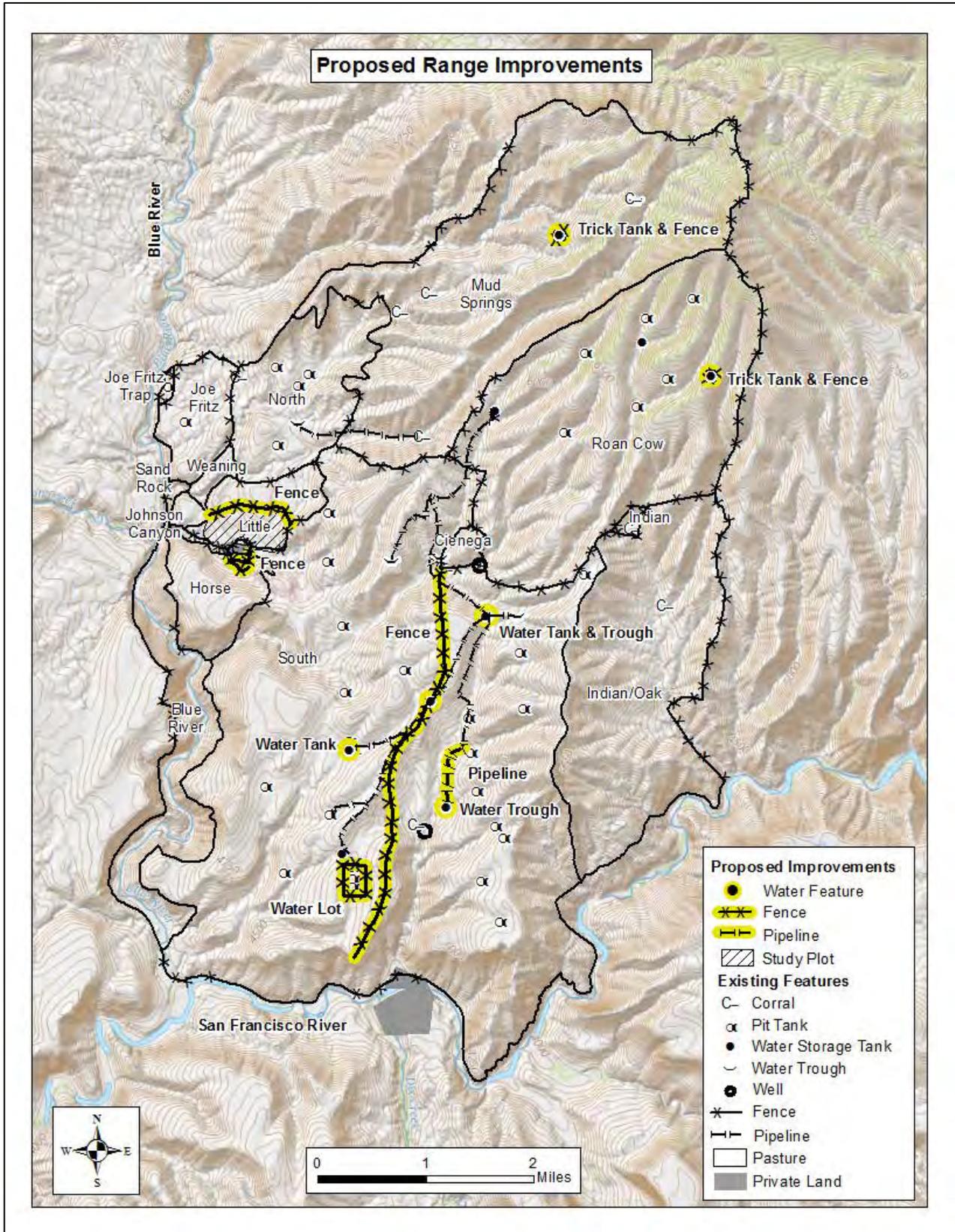


Figure 4: Wildbunch Allotment map with proposed improvements and pastures

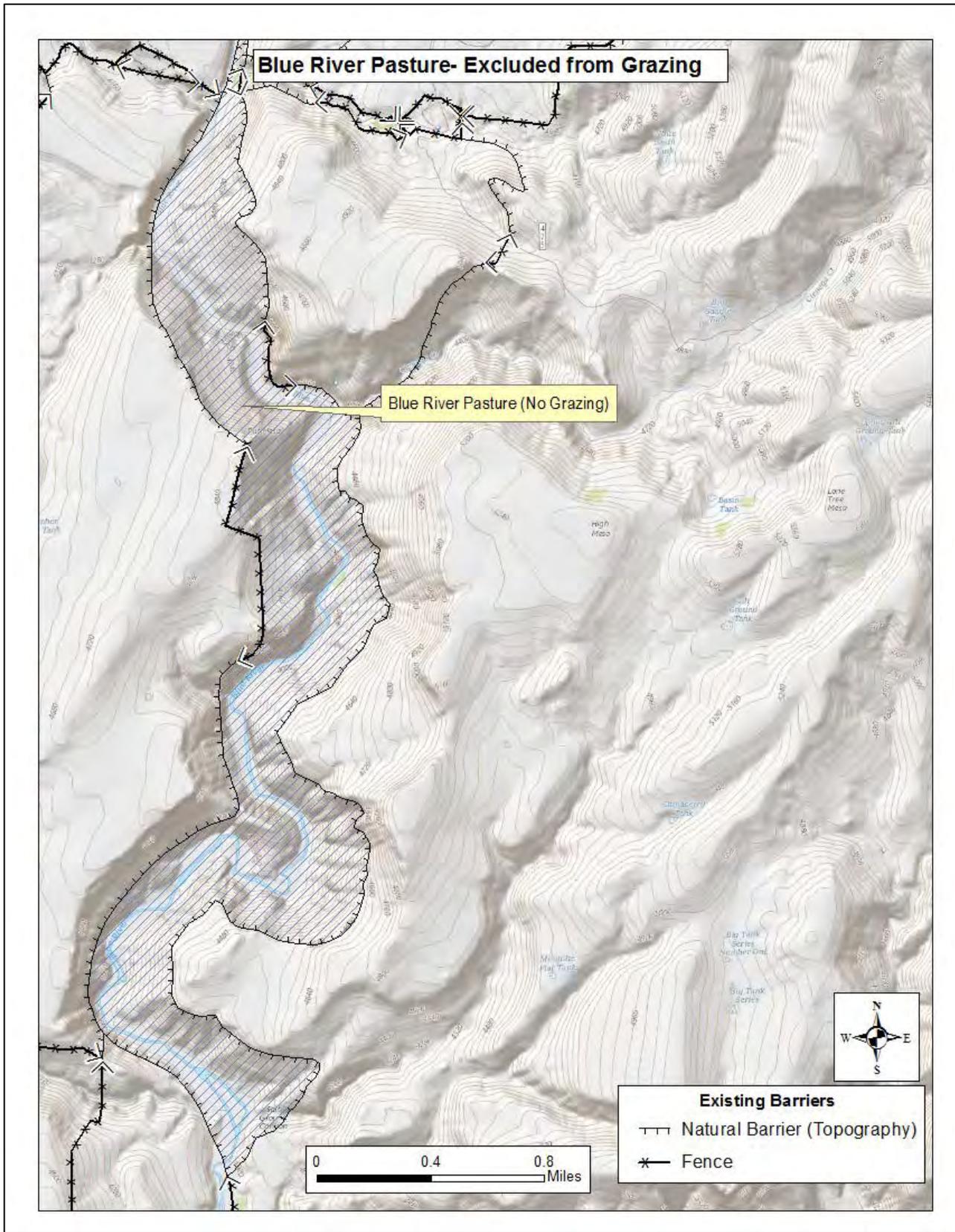


Figure 5: Blue River Pasture: Natural and Created Barriers to Livestock Use

## Rotation Strategy

A pasture rotation strategy would be used to provide rest in six pastures and to allow vegetative recovery in all pastures. Livestock would be managed under a deferred/rest rotational grazing system where the length of the grazing period within each pasture would be determined annually. Rest could include incidental use which is defined as 0 – 5% allowable use. The pasture rotation strategy includes:

- Mud Spring Pasture – Graze up to three months during the growing season one out of two years.
- North/Joe Fritz Pastures – Combine pastures and graze up to one month during the growing season, one out of two years, and rest one out of five years.
- Roan Cow Pasture – Graze up to four months during the growing season, one out of two years, and rest once every five years.
- Southeast Pasture – Graze up to four months during the growing season, two out of three years, and rest one out of three years.
- Southwest Pasture – Graze up to two months during the growing season, one out of five years, and rest two out of three years.
- Indian/Oak Pasture – Graze up to three months during the growing season one out of three years.
- Horse Pasture – Graze yearlong for eight horses. When grazing utilization levels are reached the horses would be removed.
- Little Pasture – Grazed incidentally as livestock are moved off the allotment using FS road 475 and between the Southwest pasture and Mud Springs pasture. Incidental use level is limited to between 0-5%.
- Blue River Pasture – Excluded from livestock use entirely by topography and strategically placed fences that prevent livestock entry into this 945 acre area surrounding the Blue River on both sides. Any drifting livestock would be removed immediately. See figure 5 above for an overview of the topography and fencing where the allotment intersects the Blue River.

## Proposed Allowable Use

Allowable use specifies the grazing intensity. Grazing intensity is measured by the utilization of palatable herbaceous forage along transects. Grazing intensity on woody browse is measured by percent of tree and shrub leaders browsed on plants less than 6 feet tall. Percent allowable use for riparian areas in functioning condition would be limited to 0-35% use whereas riparian areas in functioning-at-risk and non-functioning condition would be limited to 0-25%. The proposed allowable use by pasture is displayed in table 7 below. The proposed allowable use by pasture is displayed in table 7 below. The rotation strategy specifies the amount of time livestock can be in a pasture while the allowable use specifies the grazing intensity allowed. If either the time or the grazing intensity is reached then livestock are moved to the next pasture. For instance, in the Southwest pasture if any of the allowable use percentages are reached before the two month mark, then livestock would be moved to a different pasture. If the allowable use level is not reached by the two month mark livestock would still be moved to the next pasture to comply with the rotation strategy. Allowable use may be revised upward if range conditions improve to fair or good or downward if range conditions decrease to poor or very poor as monitoring indicates.

Forage utilizations proposed are at conservative (31-40%) levels during the dormant season and light to non-use (0-30%) during the growing season (FSH 2209.13). Utilization would be measured at key areas, key areas are a relatively small portion of a range selected because of its location, use or grazing value as a monitoring point for grazing use. It is assumed that key areas, if properly selected, will reflect the overall acceptability of current grazing management over the range (SRM 1998).

**Table 7: Proposed Allowable Use for the Wildbunch Allotment**

Pasture	Growing Season Allowable Use (July-Oct)	Dormant Season Allowable Use (Nov-June)	Woody Browse* (Riparian) Allowable Use**
Southwest	0-30%	31-40%	0-35%
Southeast	0-30%	31-40%	0-35%
Roan Cow	0-30%	31-40%	0-35%
Mud Springs	0-30%	31-40%	0-35%
Indian/Oak	0-30%	31-40%	0-35%
North/Joe Fritz	0-30%	31-40%	0-35%
Horse	0-30%	31-40%	0-35%
Little	0-5%	0-5%	N/A
Exclosure/Trap	0-5%	0-5%	N/A

\*Woody browse: riparian vegetation in canyon bottoms along intermittent springs and creeks.

\*\*Percent allowable use for riparian areas in Functioning at Risk and Non-functioning condition would be limited to 0-25%.

Incidental use up to 5% may be authorized for if vegetation condition improves (Little and Exclosure/Trap).

Of eleven sites on the allotment, five are at low similarity of potential vegetation, four are at mid-similarity of potential vegetation and two are at high similarity. In order to move these sites towards high similarity, light to conservative use levels would be applied to achieve this.

### Adaptive Management and Monitoring

The Proposed Action includes the application of adaptive management principles. Adaptive management is designed to provide sufficient flexibility to allow management to address changes in climatic conditions, seasonal fluctuations in forage production, and other dynamic influences on the ecosystem in order to effectively make progress toward or maintain desired conditions of the rangeland and other resources.

Under the adaptive management approach, regular/annual monitoring of short-term indicators may suggest the need for administrative changes in livestock management. The need for adaptation would be based on the magnitude or repeated re-occurrence of deviations from guidelines provided, or due to indications of a lack of progress toward desired resource conditions. The timing of such management changes would reflect the urgency of the need for adaptation. Annual operating instructions and the allotment management plan may be modified as appropriate to adapt management within the parameters of this Proposed Action.

Implementation monitoring would occur at the end of the growing season within each of the main grazing pastures by measuring grazing utilization or through the assessment of range condition. Utilization is defined as the proportion or degree of current year’s forage production that is consumed or destroyed by animals. Utilization is measured at the end of the growing season when the total annual production can be accounted for and the effects of grazing in the whole management unit can be assessed. Utilization and intensity measurements would be taken in key areas which reflect grazing effects within an entire pasture. Utilization guidelines are not intended as inflexible limits. Utilization measurements can indicate the need for management changes prior to this need being identified through long-term monitoring. A planned grazing system is designed to promote flexibility in the grazing program and to buffer the adverse effects of drought. Utilization data would not be used alone, but would be used along with actual-use, climate and condition/trend data, to determine stocking levels and pasture rotations for future years.

Effectiveness monitoring (long-term) determines if management practices are moving the allotment toward desired conditions and management objectives. Effectiveness monitoring may include measurements of attributes such as plant composition, ground cover, frequency, and other indicators. They would be monitored once every five to ten years. At least one representative monitoring site per pasture would be used as a key area. Both qualitative and quantitative monitoring methods would be used in accordance with *Interagency Technical References, Region 3 Rangeland Analysis and Management Training Guide, and the Region 3 Allotment Analysis Handbook*. See the allotment management plan in Appendix B.

If monitoring indicates that progress toward desired conditions are not being achieved on the allotment, management would be modified in cooperation with the permittee. Modifications may include adjustments in livestock numbers, timing, intensity and/or duration of grazing. These modifications would be made through administrative decisions such as: the specific number of head stocked on the allotment annually or in a particular season; the class of animals stocked (cow/calf pairs vs yearlings, steers or heifers, etc.); specific dates of grazing; livestock herd movement; and/or periods of rest, deferment, or non-use of portions or all of the allotment for an appropriate period of time, as conditions warrant. Such changes would not result in exceeding the AUMs authorized for livestock use included in this Proposed Action. Table 8 identifies several management evaluation points and management options to describe scenarios when adaptive management would be used under the implementation of the Proposed Action.

In addition to the management evaluation points in table 8, adaptive management would be triggered when allowable use or incidental use levels are exceeded for two consecutive years or in any two out of five years, as recommended by Holechek et al 1998.

**Table 8: Management Evaluation Points and Adaptive Management Options**

<b>Management Evaluation Point: <i>The "If" Statement</i></b>	<b>Adaptive Management Response Options: <i>The "Then" Statement</i></b>
<b>For all pastures</b>	
If allowable use (grazing utilization) is reached before the planned season of use is reached	Then move livestock to another pasture.
<b>For Southeast and Southwest pastures</b>	
If livestock herding is not effective in distributing livestock away from the Big Tank Series  <i>(for two consecutive years or in any two out of five years)</i>	Then erect one mile of fence around the Big Tank Series and Salt Ground Tank.
If, after the tanks are fenced, the allowable use levels are exceeded in the southwest pasture (for two consecutive years or in any two out of five years)	Then erect a four mile fence to physically divide the southwest and southeast pastures OR reduce the duration of use in SW and SE pastures OR adjust livestock numbers downward, if it is not feasible to build the fence due to funding availability or personnel

<b>Management Evaluation Point: <i>The “If” Statement</i></b>	<b>Adaptive Management Response Options: <i>The “Then” Statement</i></b>
<b>Little Pasture</b>	
If incidental use levels are exceeded <i>(for two consecutive years or in any two out of five years)</i>	Then 0.88 mile fence would be constructed to divide the pasture into two small pastures. The fence would provide the ability to rest portions of the pasture
If incidental use levels are exceeded after the pasture is split. <i>(for two consecutive years or in any two out of five years)</i>	Then exclude the portion with very poor range condition from livestock use.
If incidental use levels are still exceeded after the pasture is split and portions are excluded. <i>(for two consecutive years or in any two out of five years)</i>	Rest the entire pasture by excluding it from use.
<b>Horse Pasture</b>	
If allowable use levels are exceeded <i>(for two consecutive years or in any two out of five years)</i>	Then erect up to one mile of fence to divide the pasture into two pastures. Remove livestock to provide rest to the pasture.
If allowable use levels are exceeded after the pasture is split into two pastures <i>(for two consecutive years or in any two out of five years)</i>	Then exclude the portion with very poor range condition from livestock use.
If allowable use levels are exceeded after a portion is excluded from use <i>(for two consecutive years or in any two out of five years)</i>	Then exclude the entire pasture from livestock use.

## **Additional Management Practices and Mitigation Measures**

Below are measures designed and selected for this project that are intended to mitigate potential impacts of implementing the Proposed Action, by resource:

### **Range**

- Forest Plan Standards and Guidelines applicable to livestock grazing would be followed (Forest Plan, pp. 96-97).
- Salt can be used to help achieve proper livestock grazing distribution. Salt is not placed within ¼ mile of any live water (including dirt tanks) or riparian area (USDA 2015 and designated by AOI annually).
- Continue exclusion of Blue and San Francisco Rivers and associated riparian areas except for crossing the Blue River at Juan Miller crossing for shipping purposes. When low water permits, livestock are trailered across the Blue River;

- The ASNFs shall ensure that allotment and pasture fences are maintained to ensure that livestock are not using the Blue River for forage or watering. If fences are found to be damaged they shall be immediately repaired. If livestock are found in the Blue River they will be immediately removed per the terms and conditions of the 2017 USFWS Biological Opinion.

## Wildlife

- Prior to tank maintenance, surveys will be conducted for Chiricahua leopard frogs according to the species Recovery Plan protocol.
- Conservative forage use rates of 31 to 40 percent will be implemented in Mexican spotted owl recovery habitat (USDI 2012b) in upper Mud Springs Canyon; and;

## Riparian

- Riparian critical area monitoring of utilization levels of use of herbaceous and woody species in Indian Creek, Cienega Creek, and Wildbunch Canyons will occur.
- Design features to reduce effects to riparian areas are:
  - Monitoring utilization levels is critical when used to limit riparian use levels by triggering movement to the next pasture, before excessive use becomes a problem.
  - Percent allowable use for riparian areas in Functioning at Risk and Non-functioning condition would be limited to 0-25%.
  - Rotating the season of use would be used as a mitigation measure, as cool season or winter access of riparian drainages results in minimal effects as livestock spend minimal time there. Livestock tend to linger in these areas only long enough to water, but prefer to spend their time grazing warmer slopes, rather than loafing in canyons and drainages that act as cold air drainages. During cold seasons, livestock tend to utilize riparian vegetation minimally.
  - Duration of use is used to limit riparian area exposure to livestock effects. Rest rotation would be implemented to change riparian area effects to different seasons. Total exclusion of livestock is effective in riparian recovery if grazing effects are severe.
  - Numbers of livestock allowed or targeting a set amount of forage available for use can be used to manage effects to riparian areas.
  - Fencing is used to keep livestock from entering riparian areas. Fencing can be either in form of disconnected drift fences that address particular problem areas, continuous enclosure fences that isolate a given area, or pasture fences that can also be situated to limit riparian access.
  - Water gaps are another example of fencing that aims to minimize riparian effects to small areas, allowing livestock to access water, but disallowing access to riparian area grazing.
  - Herding can be used to push livestock out of sensitive areas, however this is a continual job as livestock have such high preference for riparian areas. Herding livestock can be a very effective method of mitigating effects to riparian areas although it can be very labor intensive.

## Water Quality & Quantity

Best Management Practices (BMPs) will be implemented to comply with the Clean Water Act (Appendix C). In the event that the above conservation measures do not accomplish site specific resource objectives, additional optional measures may be implemented. Site specific resource objectives and monitoring plan were summarized in the rangeland specialist report, and the monitoring plan is included as an appendix to this environmental assessment. These adaptive management measures would be designed to address site specific resource concerns and may include such things as temporary fencing, electric fencing, drift fences, additional livestock enclosures, temporary pipelines and water troughs, reconstruction of existing spring improvements and construction of new improvements such as spring boxes and water gaps. Fol-

lowing US Fish and Wildlife Service survey protocols, field surveys for federally threatened or endangered species will be conducted prior to reconstruction of existing improvements or the construction of new range improvements if they are proposed in listed species habitat. Adjustments will be made in the location of improvements or the timing of construction, as appropriate, in order to avoid adverse effects to these species. Additional consultation with the Service will be conducted as appropriate.

## Cultural Resources

For all cultural resources within the allotment it is understood that any management practices associated with the continued grazing on the allotment are designed to protect heritage resources from impacts caused by range construction projects or livestock concentration. Measures include but are not limited to the following:

- Before any range facilities are constructed, a district, zone, or forest archeologist will be contacted to determine if archeological survey is needed. All proposed range facilities will be surveyed by qualified personnel for heritage resources prior to any ground-disturbing activities. Facilities will be located avoid impacts to heritage resources.
- If unrecorded sites are discovered during the course of project implementation, activities will cease and a district, zone, or forest archeologist will be notified.

## Chapter 3- Environmental Effects

This chapter provides brief but sufficient summary evidence and analysis to determine the potential effects of the alternatives, including the effects of re-authorizing grazing on the Wildbunch Allotment. This portion of the environmental assessment is organized by resource area.

The existing conditions and affected environment for each impacted resource were described in chapter 1, and provide the baseline against which environmental effects are evaluated in this chapter. The *Environmental Consequences* section for each resource topic discusses direct, indirect, and cumulative effects as determined by USFS resource specialists employing the best available scientific information and using the assumptions and methodologies that are disclosed in each section. Effects can be neutral, beneficial, or adverse to various resources and form the scientific and analytical basis for comparison of the alternatives and thus provide the basis for the responsible official's decision.

### Rangeland Vegetation & Livestock Grazing Management

This section addresses both the existing upland vegetation within the Wildbunch Allotment, along with the effects associated with the management of livestock. This section contains additional information necessary to understand the affected environment and environmental effects associated with the alternatives considered.

#### Assumptions and Methodologies

Environmental consequences for rangeland resources within the project area are documented in terms of direct and indirect effects that occur within the allotment boundary for the Wildbunch Allotment, within the Apache-Sitgreaves National Forests.

The alternatives are contrasted based on the likelihood of range vegetation and livestock management attaining the desired conditions described earlier in this analysis document. For rangeland vegetation, rangeland management status (RMS) is the measure used to analyze the effects of alternatives relative to this desired condition, in addition to the amount of vegetative ground cover. The RMS is categorized as either satisfactory or unsatisfactory. The RMS for a site is considered to be satisfactory when the existing vegetation community is similar to the desired condition, or short-term objectives are being achieved.

For livestock grazing management, the alternatives are contrasted on the basis of their effects to the existing livestock operation, including number of head and the administrative grazing system such as improvements and pasture rotations.

### Environmental Effects on Rangeland Vegetation and Livestock Grazing Management

#### Alternative 1- No Grazing

Under the no-action alternative, all permitted livestock grazing within the allotment would be phased out over a 2-year period.

#### Direct and Indirect Effects on Rangeland Vegetation

With the removal of authorized livestock grazing, only incidental wildlife grazing at light intensities would be expected. The removal of livestock grazing would be expected to help the sites /areas that currently have unsatisfactory RMS within the South and Horse pastures to move towards the desired communities, as vegetative cover would increase and species composition would improve. However, it is important to note that vegetation changes occur as a result of many factors other than grazing, and disturbance is a natural feature

of plant communities (Ruyle and Dyess 2010). Even when grazing has been a cause of vegetation change in the past, completely removing grazing does not necessarily result in a return to historical conditions. For instance, in some areas, heavily disturbed plant communities can no longer achieve what may have been historic condition because of lack of a current seed source, or changes in soil characteristics. Such changes are considered state changes in the vegetation. There are areas in the Wildbunch Allotment where these state changes have occurred, especially those areas within the Little and Horse pastures. The plant communities in these areas may not move back towards desired plant communities, even in the absence of livestock. Areas that currently have satisfactory RMS would remain as such under the no grazing alternative, additional residual biomass would be retained under this alternative, which would increase the vegetative ground cover.

### Direct and Indirect Effects on Livestock Grazing

There would be no authorized livestock grazing under this alternative. Because grazing permittees would no longer be responsible for maintenance of structural range improvements, the existing improvements would fall into disrepair. Allotment boundary fence maintenance would be reassigned to adjacent grazing permit holders.

## Alternative 2- Proposed Action

The Proposed Action is described in detail in chapter 2 of the environmental assessment, and will not be reiterated here. Effects to range and vegetation resources includes both general (allotment-wide) and site-specific effects that are expected under the Proposed Action. The Proposed Action includes multiple components, which are grazing authorization, structural improvements, a rotation strategy, and an adaptive management framework. The direct and indirect effects below do not just consider the authorized numbers of livestock proposed, but also the rotation schedule, proposed improvements, and adaptive management options in reaching conclusions about potential environmental effects.

### Direct and Indirect Effects

Table 9 below displays a summary of the direct and indirect effects expected under the Proposed Action, by resource indicator and measure. Discussion of the effects follows the table.

**Table 9: Resource indicators and measures for alternative 2**

Resource Element	Resource Indicator	Measure	Alternative 2: Proposed Action
Rangeland vegetation	Rangeland management status (RMS)	Satisfactory or not satisfactory	Sites that currently have satisfactory RMS are expected to remain satisfactory; sites with unsatisfactory RMS in the Southwest pasture are expected to move to satisfactory; sites in Horse and Little pasture that have received heavy use in the past may not be capable of moving towards desired, study plots would help identify potential for those sites.
Rangeland vegetation	Vegetative ground cover	Percent vegetative ground cover – meeting potential or not	All sites currently meeting potential are expected to continue meeting potential; those not currently meeting potential are expected to move towards meeting potential.
Livestock grazing management	Authorized livestock use	Potential to affect livestock operation, including number of head and grazing system	Authorized livestock use is expected to remain consistent with recent levels; improved livestock management allotment-wide from splitting and combining pastures and installation of new range improvements

### *Rangeland vegetation – Allotment-wide effects*

Livestock grazing can directly affect vegetation by reducing plant height, total canopy cover, and ground cover. However, research has shown that forage plant health and productivity, and overall ecological condition of rangelands can be improved or maintained through properly managed livestock grazing. Use levels like those proposed in alternative 2, the Proposed Action, can maintain or increase forage production and vegetation composition.

Researchers have found that the light to conservative allowable use levels, can increase forage production and improve vegetation composition (Holechek et al. 2004). Increasing forage production and improving vegetation composition moves existing conditions towards a higher similarity to desired vegetation. Further studies of rangeland with similar plant communities and precipitation amounts have supported the ability of the project area to support livestock grazing while maintaining overall ecological condition (Molinar et al. 2011). These studies support the conclusion that managed livestock grazing, with an intensity and strategy as proposed under the Proposed Action, can result in maintaining or moving the plant community towards the desired condition (Castellano and Valone 2007). Moving a plant community towards desired conditions would result in a trend towards satisfactory RMS. Implementing the proposed pasture rotation strategy would provide for rest in six pastures, allowing for vegetative recovery in all pastures. Allowing for vegetative recovery can help move a plant community towards the desired community and increase vegetative ground cover. More complete detail on the studies supporting these conclusions can be found in the rangeland specialist's report in the project record.

Issuing the term grazing permit for a range of livestock numbers, alongside including the adaptive management components and the administrative actions of combining or splitting pastures all help provide the flexibility to make adjustments to the grazing strategy based on monitoring results. These components are expected to help maintain existing conditions or move plant communities towards desired conditions, resulting in a satisfactory RMS. The adaptive management component would further provide flexibility to make management changes if monitoring indicates the plant communities are moving away from desired in any of the pastures.

### *Rangeland vegetation- Pasture specific effects*

In addition to the effects disclosed above in the *Rangeland vegetation – Effects common to all pastures* section the following effects are expected on a pasture-by-pasture basis with the implementation of the Proposed Action.

#### **Southwest pasture**

The Proposed Action is expected to help move the plant communities in the analyzed TEUs for this pasture towards the desired vegetation. The Proposed Action is expected to increase the vegetative ground cover pasture-wide. The proposed grazing strategy would result in deferment from grazing during the growing season four out of five years and the pasture would be rested two years out of three years. This strategy would, to the extent possible, increase vegetative ground cover and ultimately move the plant community towards desired conditions and satisfactory RMS. Splitting the South pasture is expected to enhance the grazing management of the area, improving livestock distribution which would provide relief from grazing pressure and ultimately result in an increase in vegetative ground cover.

#### **Southeast pasture**

Both TEUs analyzed in the Southeast pasture currently have satisfactory RMS, and are meeting potential for vegetative ground cover. Under the proposed grazing strategy, this pasture would be deferred from grazing during the growing season one year out of three years. The pasture would also be rested one year out of three years. This strategy would maintain current vegetative ground cover. Overall range trend would continue to be static or upward. Satisfactory RMS would be maintained. As above, the action of splitting the

South pasture and constructing proposed structural range improvements is expected to enhance the grazing management of the area, improving livestock distribution which would provide relief from grazing pressure and maintaining the satisfactory conditions.

### **Mud Springs pasture**

The TEU analyzed in the Mud Springs pasture currently has a satisfactory RMS and is meeting potential for vegetative ground cover. Under the proposed grazing strategy this pasture would be deferred from grazing during the growing season one out of every two years. This strategy is expected to maintain or improve current vegetative ground cover. Overall range trend would continue to be static or upward, and satisfactory RMS would be maintained. The water development proposed in the Mud Springs pasture would enhance the livestock grazing management of the area, primarily by improving livestock distribution and thus providing relief from grazing to some areas. The improvement to livestock distribution should maintain the satisfactory existing conditions in that pasture.

### **Roan Cow pasture**

The TEU analyzed in the Roan Cow pasture currently has a satisfactory RMS and is meeting potential for vegetative ground cover. Under the proposed grazing strategy this pasture would be deferred from grazing during the growing season one year out of two years and the pasture would be rested one year out of five years. This strategy is expected to maintain or improve current vegetative ground cover. Overall range trend would continue to be static or upward. Satisfactory RMS would be maintained. The water development proposed in the Roan Cow pasture would enhance the livestock grazing management of the area, improving livestock distribution, providing relief from grazing to some areas and maintaining the satisfactory conditions.

### **Indian/Oak pasture**

The TEU analyzed in the Indian/Oak pasture currently has a satisfactory RMS and is meeting potential for vegetative ground cover. Under the proposed grazing strategy this pasture would be deferred from grazing during the growing season one year out of three years. This strategy is expected to maintain or improve current vegetative ground cover. Overall range trend would continue to be static or upward, maintaining satisfactory RMS.

### **North/Joe Fritz pasture**

Combining the North and Joe Fritz pastures is not expected to have any on-the-ground effect, other than simplifying the management of the allotment. Under the Proposed Action this pasture would be deferred from grazing during the growing season one year out of two years and the pasture would be rested one year out of five years. This strategy would maintain or improve current vegetative ground cover. Overall range trend would continue to be static or upward. Satisfactory RMS would be maintained in this pasture.

### **Horse pasture**

Under the Proposed Action this pasture would be grazed yearlong by 8 horses, when the allowable use of light to conservative utilization is met the horses would be removed. This strategy would improve vegetative ground cover. In areas that have not had a state change, plant communities are expected to move towards desired. The improved plant composition and vegetative ground cover would help move the plant community towards desired, resulting in satisfactory RMS. However, in those areas that have had a state change in vegetation (areas that were historically overgrazed) the plant communities may have crossed a threshold from which they may not be capable of returning to the desired condition.

### Little pasture

Under the Proposed Action the Little pasture would receive only incidental use (less than five percent). The grazing strategy of incidental use only would allow for vegetative recovery and improve vegetative ground cover, ultimately moving the plant community towards desired in areas that are capable. As discussed under alternative 1, some areas have experienced a state change in vegetation are unlikely to change even with a change in grazing management.

### Blue River pasture

No direct or indirect effects are expected under the Proposed Action as livestock would continue to be excluded from this pasture.

### *Livestock Grazing – Allotment-wide Effects*

Under the Proposed Action the term grazing permit for the allotment would be issued for a range of livestock numbers (i.e. instead of a permit for 311 cow/calf pairs, the permit would be for 188 to 311 cow/calf pairs). This proposed change is not expected to have an appreciable effect on the authorized grazing on the allotment because the authorized grazing has been well below the permitted level of 311 cow/calf pairs for several years. Issuing the permit in the manner proposed provides management flexibility and is consistent with current agency direction provided in the Southwestern Region supplement to the Grazing Permit Administration Handbook (FSH 2209.13 Chapter 90, Supplement 2209.13). These effects are common to all pastures, save those excluded from livestock use under the Proposed Action.

Implementing a pasture rotation strategy that includes light to conservative allowable use, an adaptive management component, proposed structural range improvements and the administrative actions of combining or splitting pastures all help provide grazing management flexibility and are expected to help maintain the authorized use levels on the allotment in a manner that corresponds with the desired conditions for livestock grazing identified in the 2015 Apache-Sitgreaves Forest Plan.

## Cumulative Effects on Range and Vegetation Resources

### *Past and Present Activities*

Past, present, and reasonably foreseeable future actions over the last 10 years were evaluated. The effects of past actions have been incorporated into the existing condition discussion and include: Blue River fish barrier, Blue River native fish introduction, and dispersed recreation activities.

**Table 10: Past and present activities on the Wildbunch Allotment**

Past and Present Activity	Timeframe	Location	Comments
Wallow Fire	2011	ASNFs	<ul style="list-style-type: none"><li>• 538,000 acres burned;</li><li>• 8.5 miles of dozer line constructed and rehabilitated;</li><li>• 0.4 mile of handline constructed and rehabilitated;</li><li>• Across Wallow Fire area, 81,500 acres seeded and 26,000 mulched;</li><li>• 2,000 miles of hazard tree removal within Wallow Fire boundary, 446 miles of hazard tree removal within project boundary;</li><li>• Effects to watersheds above the Wildbunch Allotment for the Blue and San Francisco River systems (portions of both included in this allotment).</li></ul>

Blue River Fish Barrier	2012	Clifton Ranger District (Lower Blue)	Fish barrier was completed in 2012. Maintenance of barrier will continue for the structures expected lifespan (100 years)
Blue River Native Fish Introduction	2012 – Present	Clifton Ranger District (Lower Blue)	Fish barrier was completed in 2012. Native fish will be reintroduced to system.
Whitewater Baldy Fire	2012	Gila National Forest	Fire burned 297,845 acres and had effects on the upper end of the San Francisco River. The river is on the southern end of the project area.
Recreational Activities	Ongoing	Clifton Ranger District	Motorized and Non-Motorized trails; Dispersed recreation especially during hunting season from October to April.

### *Reasonably Foreseeable Future Activities*

Reasonably foreseeable future actions in the project area are listed in table 11. The Apache-Sitgreaves National Forests will be analyzing changes to travel management in conformance with the Travel Management Rule including prohibiting motor vehicle use off designated National Forest road system routes. However a decision has not yet been made, making it premature to predict the changes that would occur from the decision.

**Table 11: Reasonably foreseeable future actions in the Wildbunch Allotment**

Reasonably foreseeable future actions (from ASNF SOPA)	Timeframe	Location	Comments
ASNF Travel Management	2014 - onward	ASNFs	Reduction of extent of off-trail and off-road motorized use.
Livestock Grazing	Ongoing	ASNFs	Livestock grazing on the Wildbunch Allotment and adjacent allotments; past range improvements.

### **Cumulative Effects of Alternative 1- No Grazing**

The additional activities included in the table above do not result in measurable cumulative effects when considered alongside the effects of the no grazing alternative already disclosed above.

### **Cumulative Effects of Alternative 2- Proposed Action**

The effects of these other activities, when added to the effects disclosed in the above analysis, do not change the anticipated effects to the rangeland management status or level of authorized livestock use on the allotment as disclosed above. The effects created through livestock grazing, improvement reconstruction and the adaptive management described for the action alternative, when added to the other past, present and future activities do not result in measurable cumulative effects.

Recreational activities related to non-motorized trails and dispersed recreation have short term effects and primarily consist of minor ground disturbance. Motorized recreation, if contained to existing roads, has limited effects on vegetation in the project area. If motorized use occurs off existing roads effects to vegetation and soil could occur. Unauthorized roads compact soil preventing vegetation to grow and cause erosion. Due to the remote location of the allotment and difficulty in accessing the terrain, recreational effects are minimal and consist primarily of hunters in the fall on horseback.

## Soils & Watersheds

### Assumptions and Methodologies

The Terrestrial Ecosystem Survey (TES) of the Apache-Sitgreaves NFs inventory was used with field observations to describe the existing soil conditions of the Wildbunch Allotment as disclosed in chapter one. The projected effects to soils and watersheds in this chapter are based on the ability of the alternatives to move soil conditions in TES map units towards increased ground cover to protect soil productivity. See table 12 below for an overview of the existing and desired ground cover levels used to evaluate the alternatives.

**Table 12: Desired condition for vegetative ground cover to protect soil productivity and water quality from the Terrestrial Ecosystem Survey for the Apache-Sitgreaves National Forests.**

TES Map Unit #'s highlighted in **red** are inherently unstable soils. Based on the Universal Soil Loss Equation (USLE) these soils are eroding faster than they are renewing themselves, but are considered to be functioning properly and normally (USDA-FS, 2013).

TES Map Unit #	% of Map Unit in the Allotment	Existing Vegetative Ground Cover	Tolerance Vegetative Ground Cover
#102	1%	20	20
#130	16%	5-10	25 or maximize where possible
#220	16%	5-10	40 or maximize where possible
#224	1%	5-10	45 or maximize where possible
#379	6%	9-27**	10
#412	26%	25	25
#432	4%	20-33**	25
#469	2%	5-38**	45 or maximize where possible
#470	4%	10-18**	40 or maximize where possible
#480	3%	15-25**	10
#512	1%	15	45 or maximize where possible
#573	1%	20	20
#612*	5%	40	40
#612	8%	40	50 or maximize where possible
#618	2%	45	70
#628	1%	55	60
#632	2%	20-30**	25
#732	1%	30	40 or maximize where possible

\*slopes less than 40 percent.

\*\* it was determined that ranges of values were best suited to describe map units where long-term rangeland vegetation monitoring data was collected in 2013 and available to combine with TES manuscript information. Where ranges are not presented, there was no long-term rangeland vegetation monitoring data available so those values came from the map unit information listed in the Apache-Sitgreaves NF TES manuscript.

## Environmental Effects on Soils

### *Alternative 1- No Grazing*

This alternative will provide the fastest recovery of soil conditions of the two alternatives. Plant utilization will be low as wild large ungulate use is expected to be low. Residual plant material will provide litter and add to surface roughness. The additional organic material will eventually be incorporated into the soil to improve water infiltration and nutrient storage. In areas where tree overstory densities are high, little improvement will be seen without mechanical treatment or the artificial introduction of fire. Lack of livestock trampling will allow biological crusts to expand to their maximum extent in time.

Residual vegetative material would be potentially more available to provide fuel for the reintroduction of fire to maintain fire adapted ecosystems in the woodland, juniper savannah and grassland vegetation types. No restrictions on timing and amount of fire would be necessary due to forage needs by a grazing operation.

### *Alternative 2- Proposed Action*

Soils, water quality and watershed conditions are directly impacted by grazing activities in the following ways and will be described together. Improving the amount and distribution of ground cover will result in improvement in soil and watershed condition and reduce sediment production on areas that are currently in impaired or unsatisfactory condition. These conditions are expected to improve to or trend towards satisfactory condition with the implementation of the Proposed Action for the following reasons:

- This alternative provides needed seasonal rest during critical growth periods in most pastures two of every three years which will allow for natural seed production and plant productivity.
- It provides stocking rates at or below calculated carrying capacity for proper utilization of plant species to allow for plant maintenance and recovery (Holechek and Galt, 2000; Holechek et al, 2001; Holechek et al. 2004).
- The alternative requires the monitoring of vegetative conditions to be able to adjust the length of time livestock remain in a pasture to ensure that over utilization does not occur, and will allow for the adjustment of livestock numbers, either up or down, which will allow areas to achieve or trend towards satisfactory condition within the term of the grazing permit (10 years).
- Riparian areas and highly eroded areas are monitored carefully and mitigating action will be initiated if proposed utilization levels are exceeded. Management objectives are tailored to minimize use in these areas through physical barriers, topography, herding, and improved water distribution.
- Impaired and unsatisfactory soil condition areas will be evaluated by establishing and monitoring key areas to determine if resource objectives are being met.
- Livestock re-distribution from areas of heavy historical use to areas where use has been incidental or low will allow for recovery of identified potentially capable range and reduce impacts to riparian resources. South and Horse pastures are areas of heavy historic use, which will be reduced considerably over current management until conditions improve.
- Implementation and monitoring of soil and water conservation BMPs (see Appendix C) will mitigate non-point source pollution by reducing sediment to streams and to protect long term soil productivity by mitigating accelerated soil loss.

The improved distribution of livestock, rest and deferment of pastures found in the Proposed Action reduces direct impacts to plants from trampling and use, and to soil biological crusts from hoof action as compared to existing conditions. Biological crusts on most soils of the Southwest are more tolerant of disturbance when soils are moist. Thus, biological soil crusts would most likely improve in these areas under grazing management that provides protection when soils are very dry, or extremely wet. Late fall/early winter grazing is least likely to cause damage to crusts (Belnap et al., 2001). Researchers have further suggested that periodic rest from grazing benefits crust organisms (Brotherson and Rushforth, 1983; Belnap et al. 2001)

and recommend light to moderate grazing in the early to middle of the wet season. Under the Proposed Action, plants and biological crusts will benefit from varying seasons of use, improved distribution of livestock, and incorporating rest.

A majority of the soils within the Little and Horse pastures are currently in unsatisfactory or impaired condition. A seeding trial may be implemented and monitored to determine the best seed mix and planting technique to rehabilitate similar soil conditions across the allotment. The Little pasture will not be grazed until ecological condition reaches mid-seral as stated in the alternative, however, grazing intensity should be low even after the recovery period. Both warm and cool season plant critical growth periods would be avoided through the pasture rotation timing in order to allow the plants to re-establish carbohydrate reserves necessary for root establishment and growth. After vegetation and watershed goals are met in this pasture, light grazing after monsoons have been well established (late August to early September) or during winter dormancy (December through February) which will allow vegetation and biological crusts to continue to improve. Plant material not consumed will add to needed litter and soil organic matter to improve water infiltration rates, which currently are very slow. The destruction of the crust through hoof action, while advocated by some (Savory, 1988), does not result in increased plant cover (Ladyman and Muldavin, 1996) and will cause damage to biological crusts or impede their re-establishment (Belnap et al., 2001).

The adaptive management strategy provides corrective measures in case management objectives are not being attained as observed through monitoring (see monitoring plan in project record). Corrective measures rely on physical barriers, such as fences, to restrict livestock access to areas that are not responding from only modification of animal behavior. Most of the impaired or unsatisfactory soils are in areas around historically dependable water sources that livestock are familiar with such as found in the western portion of the South pasture. Existing and proposed water sources distribute livestock use to areas where forage and soil conditions are in better shape and can better sustain grazing.

As mentioned in the existing condition section, monitoring of the Blue River and San Francisco River both have had levels of *E. coli* bacteria that are above the state water quality threshold that were detected in the recent past. Sources of the *E. coli* impairment have not been determined and are under ongoing investigation. Although the Wildbunch Allotment boundary includes portions of both rivers, grazing activities are not proposed to be authorized within the Blue or San Francisco Rivers except for crossing to access shipping corrals on the west side of the Blue River. During shipping, livestock may cross the Blue River at the Juan Miller road crossing. High bacteria readings found above and below that point indicate that there are other sources of the impairment other than grazing on this allotment. The watershed plan that is being developed by the local Gila River Watershed Association will provide recommendations to address this impairment.

#### *Cumulative Effects on Soil Resources*

It is anticipated that the Proposed Action coupled with other livestock grazing activities within the watersheds may continue to negatively impact the soil and watershed conditions in localized areas in the immediate short term. However, no significant long term negative effects to soil productivity, water quality or quantity are expected with the implementation of the Proposed Action for the Wildbunch Allotment. This would be the case for the no grazing alternative as well. The implementation of BMPs and the ability to monitor utilization and adjust livestock use based on utilization and condition provides for protection of upland vegetation, which should improve overall flow conditions across the allotment. See "*Cumulative Effects Analysis on Watersheds for the Wildbunch Allotment*" in the project record for more detail.

## Riparian Resources

Environmental consequences for riparian resources within the project area are documented in terms of direct and indirect effects that occur within the allotment boundary for the Wildbunch Allotment, within the Apache-Sitgreaves National Forests, as well as cumulative effects that may be larger in scale, extending to watersheds and sub-watershed within the surrounding area.

## Assumptions and Methodologies

The method used to assess riparian area functionality in this assessment is the PFC, or Proper Functioning Condition framework (Prichard et al, 1998). The Forest Service and the Bureau of Land Management use this method as a standard protocol throughout the western states. This assessment requires professional judgment applied across 17 individual factors to derive the summary rating. This method was used to describe the existing condition of the affected environment in chapter 1 of the EA, and PFC provides the desired condition against which our proposed management actions and alternatives are evaluated against.

The analysis and expected outcomes of the alternatives that are evaluated below are built on the following two key assumptions. The first assumption that this assessment relies on is the assumption of normal climate inputs, such as precipitation. Normal precipitation patterns are assumed to produce sufficient moisture for forage production in the watershed, as well as produce flows to sustain and improve riparian conditions. Setbacks are common in riparian recovery and can be caused by unusually high precipitation events with ensuing flood damage, or more commonly, unusually low precipitation, causing droughts that limit growth potential. The second assumption that this assessment is built on is the assumption of proper grazing management in line with the Proposed Action. Riparian recovery depends on vegetative recovery as well as maintenance of hydrological features such as stream banks and floodplains. Close monitoring of livestock effects as found in the Wildbunch Allotment Monitoring Plan (see project record / appendix) along with timely preventive action will be key to showing success in riparian recovery. In order to limit riparian use and achieve upland utilization goals, it may be necessary to continually herd livestock as often as necessary or erect fences as discussed in the adaptive management plan.

It is also noted here that an "improving trend" is not defined as a strict expectation to reach PFC within the 10 year term that the AMP and associated permit would cover, however the trend towards improvement should be obvious and measurable within that timeframe.

## Environmental Effects on Watershed & Riparian Resources

### *Alternative 1- No Grazing*

Under this alternative, key areas such as the riparian corridors would not be impacted by herbivory or hoof-related impacts. Herbaceous riparian species would be allowed to establish on banks and redeveloping floodplains, and woody species would be allowed to mature and reach full height without loss of terminal buds and branches. This allows fastest vegetative recovery, as well as eliminating impacts to bank and floodplain building processes.

It is expected that stream hydrology conditions would improve alongside the improvement of upland watershed condition over time. Large areas within the watersheds in the allotment area have characteristics of having steep slopes and soils with little soil moisture storage ability. High intensity summer precipitation events generally overwhelm the soils ability to infiltrate, and will produce runoff events with relatively large peak flows, although short duration. Additional ground cover may add surface roughness to slow overland flows and to promote increased infiltration rates to hold moisture on site for longer periods, thus reducing sheet flow and peak flows.

### *Alternative 2- Proposed Action*

As with soils, watersheds and riparian areas are expected to benefit from improvements in the amount and distribution of ground cover resulting in reduced sediment production and associated impacts on areas that are currently in impaired or unsatisfactory condition. However, it is not expected that riparian recovery will be complete in all riparian areas, though the grazing rotation plan does allow for rest through entire growing periods.

Improvements under the Proposed Action are also based on following a number of well documented riparian best practices for grazing implemented across the western U.S. to be incorporated into management of the Wildbunch Allotment under the Proposed Action. The following table describes the best practice, its general benefit or mitigation to livestock grazing, and how the Wildbunch Allotment management plan implements the best practice for desired results.

**Table 13: How the management plan implements best practices for the Wildbunch Allotment.**

<b>Best Grazing Practice for Riparian Improvement</b>	<b>General Benefits to Riparian Areas</b>	<b>How Proposed Action Implements Best Practice (cross-reference with chapter 2)</b>
1. Short grazing period leads to long recovery period	Reduces overuse on woody species terminal growth from less re-grazing on same plants, improves forage quality, increases use on less desired plants, stimulates regrowth, minimizes cumulative effects to riparian vegetation and allows for woody plants to recover before subsequent grazing	Based on the allotment's typical grazing rotation schedule, there are no periods greater than four months planned in each pasture each year, and pastures are grazed at different times in following years. Deferred rest rotation allows for greater than 1 year complete rest in most pastures during 5 years rotation. Riparian areas such as the Blue River and San Francisco River within and adjacent to the allotment are excluded from livestock grazing.
2. Regrowth before winter	Key factor in riparian recovery to allow for recover prior to dormancy for better spring growth performance and protection from spring runoff flows.	Allows for woody species recovery as well as minimum levels of stubble height for bank stability most years

<b>Best Grazing Practice for Riparian Improvement</b>	<b>General Benefits to Riparian Areas</b>	<b>How Proposed Action Implements Best Practice (cross-reference with chapter 2)</b>
3. Vary season of use from year to year	Meets plant phenology needs, allows for complete growing season rest.	Deferred rest rotation allows change in season of use, allowing use during critical growth periods only 1 in 3-5 years for either cool or warm season species in uplands as well as riparian recovery summer through fall.
4. Occasional Rest	Opportunity for plants to regrow leaves and roots.	Deferred rest rotation allows for greater than 1 year complete rest in most pastures during 5 years rotation.
5. Woody plants allowed to grow	Allow plants to grow above grazing heights with deferment and occasional full year of rest.	Deferred rest rotation allows for greater than 1 year complete rest in most pastures during 5 years rotation.
6. Riparian pastures with riparian objectives	Allows for most flexibility for protection of riparian areas based on intensive management	Proposed as a tool in the adaptive management strategy if proposed monitoring elements are not met.
7. In pasture during cool or warm season, vs. hot season	Cool or warm, not hot seasonal use most years. Hot season use (June-Aug) tends to concentrate cattle in riparian areas where there is water and shade.	Deferred rest allows for better use of uplands vs riparian in most years. Each pasture with riparian areas deferred during hot season in 2 out of 3 every years.
8. Graze early in growing season	Upland forage is more desirable (less rank) and there is more time for regrowth of riparian plants prior to winter dormancy.	Deferred rest allows time for riparian recovery prior to winter in most years.
9. Moderate to light grazing intensity	Allowable use moderate or light provides for plant health maintenance and recovery of root systems.	See Proposed Action for allowable use details. Adaptive management strategies will be implemented if overutilization occurs. Low stubble height and excessive bank damage also indicators of excessive use.
10. Even use	All plants grazed, not concentrated in riparian areas.	Better distribution through use of proposed new water sources, herding and use of supplements
11. Riding, herding, Stocksmanship	Physically moving cattle out of critical areas improves distribution and provides for even use	Manager is encouraged to keep cattle out of riparian areas so as not to exceed use. Trailing along riparian limited to small groups only if necessary (cf. forest plan guideline)
12. Cleared pastures	All livestock moved during pasture rotations to ensure recovery periods for riparian areas.	Manager is required to start and finish moves within the allotted timeframes (2 weeks) which also provides the control necessary to evaluate effectiveness of grazing plan meeting objectives and adaptive management strategy.
13. Off stream water access.	Improved distribution of water provide better use of uplands	New improvements including pipelines and stock tank locations for better cattle distribution to use areas previously avoided due to lack of water, reduces need for some historic riparian/near riparian livestock watering.
14. Salt/Supplement scattered across pastures.	Improved distribution of livestock	Forest guidelines restrict salt/supplement within ¼ miles of riparian/streams.
15. Select hill climbing cattle vs. bottom dwelling.	Wider distribution across pastures	Many individuals of existing herd have been observed on areas well out of riparian areas even in steep canyon areas.

The proposed action suggests allowing up to 35% use in riparian areas during growing season on PFC riparian areas, and 25% use on riparian woody species on those in FAR or NF. Methods described above, notably for better cattle distribution and varying season of use, should result in less than maximum forage use. While the effects of various rotational grazing schedules no doubt can have different impacts, these impacts are secondary, and additive to less than favorable climatic conditions, such as we are currently experiencing. During drought, far less vegetative growth occurs, even throughout riparian areas. Most of the riparian areas surveyed were not meeting desired conditions currently, being in a condition somewhat less than PFC (Proper Functioning Condition). Those reaches rated at FAR (Functioning-At-Risk) will improve as browsing is monitored on riparian woody species, and there is rest built in to allow them to mature and reproduce. Some of these are a result of poor watershed condition and extremely high runoff events that scour the channel on every runoff event. Restoration of the riparian system is contingent on improvements in watershed conditions.

### *Cumulative Effects on Riparian Resources*

There are two 5<sup>th</sup> level hydrologic unit code watersheds and three 6<sup>th</sup> level hydrologic unit code watersheds that are directly affected by the Wildbunch Allotment. This analysis of cumulative effects is divided into the following two sections:

- Overview of the past, present and reasonable foreseeable activities within the watershed.
- The cumulative impacts to the watershed that can be expected with implementation of the alternatives associated with the Wildbunch Allotment.

### *Past and Present Activities*

#### **Livestock Grazing**

Primarily since 1995, grazing by livestock has been analyzed for compliance with Forest Plan standards and other laws. Decisions to balance permitted livestock use with grazing capacity have been made and others are planned in compliance with the direction found within the 1995 Rescissions Act and associated NEPA Schedule. To date, decisions such as these have generally resulted in similar or reduced permitted grazing on the Forests. There are 41 grazing allotments on the Apache-Sitgreaves National Forest that are in whole or in part within Greenlee County, which includes the Wildbunch Allotment. Two of these allotments near Wildbunch Allotment are vacant; Sandrock which has been closed for 32 years, and Pleasant Valley, vacant for 10. Other allotments are under agreements that have reduced stocking conditions and that grazing is limited by recovery of rangelands from activities such as prescribed fire, or until range improvement are completed.

#### **Recreation and Road Use**

Road density in all three watersheds is very low. The watershed areas are used for many types of forest recreation, bunting, hiking, mountain biking, horseback riding, and motorized off-highway driving is limited due to access. All of the roads in the watershed are low standard roads, often lacking adequate maintenance and drainage due to their remoteness. These roads may be used during wet weather, which can cause ruts and affect the water drainage on the road. Soil loss and downstream sedimentation is occurring on many of these roads that lack proper drainage features. The forests have re-initiated the Travel Management Planning analysis, through which all roads on the forest will be located and analyzed. A decision for this process is planned for completion in federal fiscal year 2019. After this process is completed, no off-road vehicle travel will be allowed except for on designated travel routes, big game retrieval and dispersed campsites. This resulted in disturbance to the stream bottom, stream banks, and floodplain.

#### **Fire**

During the past twenty-five years, wildland and prescribed fires of various sizes have burned in these watersheds, with approximately 1,200 acres within the sub-watersheds having been burned. A majority of these fires have been relatively small in size, however four large fires (>300 acres) have burned. Large fires are

most likely to have the greatest effect on water flow and watershed condition. It is estimated there are effects to sediment and peak flows from the Wallow and Whitewater/Baldy fires of 2011 and 2012, however, both of these very large fires occurred in sub-watersheds many miles above these watersheds, and effects are diluted. It is expected that effects from these fires will reduce over time as upland conditions improve.

### **Vegetation Management (non-Fire)**

There has been very limited vegetation management activity in the watershed in the past. The watershed areas are currently open to fuelwood harvest except within the Blue Range Primitive Area. No roads are constructed to accommodate this activity and impacts are minimal.

### ***Reasonably Foreseeable Future Activities***

Other ongoing actions include the adjustment of grazing levels over the next 1 to 10 years as a result of grazing permit decisions to align permitted numbers with grazing capacity for all of the allotments within the three watersheds. Road system analysis could recommend reductions in or improvement of poorly located and eroding roads. Some unauthorized routes could be closed, but due to the low density existing now, it is unlikely system road density will decrease. Other vegetation treatment projects within the watersheds, primarily prescribed fire, will be identified as a result of the Forest's ongoing efforts to restore fire adapted ecosystems.

### ***Cumulative Impacts of the allotment at the Watershed Scale (5th Level Hydrologic Unit Code):***

Generally speaking, grazing allotments have impacts to three types of watershed outputs: water quantity, water quality, and sediment yield, all of which can potentially affect riparian resources. The Blue and San Francisco watersheds have a very high level of natural sediment yield, and small increments attributable to allotment management are minute at the watershed scale or 5th HUC level. Sediment, especially fines, can have impacts on fish habitat within perennial stream systems. However, this is more related to adequate sediment handling within the riparian area (PFC), rather than a function of sediment supply. Fine sediments are normally handled in functioning riparian systems by depositing on adequate floodplains during over-bank flooding, while a lack of functioning floodplains can cause fines to remain in the channel and plug gravel substrates. The expected effect this allotment potentially has on sediment yield to the entire Blue River watershed is negligible regarding impacts specific to riparian resources.

### ***Cumulative Impacts of the allotment at the Sub-Watershed Scale (6th Level Hydrologic Unit Code):***

For both alternatives, there is the potential to show positive cumulative effects to the indicators of riparian/wetland vegetation. While the overall watershed condition classifications would not change, it cumulative impacts would be expected to result in a positive trend. Full considerations of these impacts is detailed in the specialist report on cumulative effects to watersheds, found in the project record.

## **Wildlife**

Environmental consequences for wildlife within the project area are documented in terms of direct and indirect effects that occur within the allotment boundary for the Wildbunch Allotment, within the Apache-Sitgreaves National Forests, as well as cumulative effects that may be larger in geographic scale, referred to as the "action area" in this portion of the analysis, which typically refers to aquatic habitats potentially impacted by actions occurring on the allotment.

## **Assumptions and Methodologies**

A list of endangered, threatened, proposed, and candidate species was compiled using district files and the threatened & endangered species concurrence list developed between the Forests and US Fish & Wildlife Service. This project was analyzed and assessed with consideration of the best available science including published species Recovery Plans, Forest Plan standards and guidelines, research and published literature,

life history literature, approved survey protocols, implementation of established mitigation measures, and professional judgment.

For the purposes of analyzing impacts to aquatic wildlife, the action area includes all acres within 5<sup>th</sup> HUC watersheds that may be affected by the Proposed Action, as well as hydrologically connected streams for up to 10 miles downstream from the project boundary.

This analysis of potential effects to wildlife takes into account the implementation of design criteria and mitigation measures, including compliance with published recovery plan direction for various species. For federally-listed species, as well as proposed and designated critical habitat for those species, the U.S. Fish and Wildlife Service was consulted with throughout this process and a Biological Opinion was received, concurring with the determinations contained in this analysis.

## Affected Species

### Threatened and Endangered Species

Table 14 below shows threatened and endangered species (TES) that may occur or have suitable habitat on the allotment. Species that are known to occur or have the potential to occur on the allotment were further analyzed in the effects analysis, while species that are not present or lacking potential habitat in the project area were dismissed from detailed analysis. Greater detail on all of these species can be found in the project record.

**Table 14: Federally listed, proposed, candidate species; and critical habitat**

Common name ( <i>Genus and species</i> )	Legal status	Suitable habitat	Known to occur	Critical habitat
<b>Mammals</b>				
Mexican wolf ( <i>Canis lupus baileyi</i> )	EN	Yes	Yes	N/A
<b>Birds</b>				
Mexican spotted owl ( <i>Strix occidentalis lucida</i> )	T/CH	Yes	No	Yes, in action area.
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	E/CH	Yes	No	Yes, in action area.
Western yellow-billed cuckoo ( <i>Coccyzus americanus occidentalis</i> )	T/pCH	Yes	Yes	Yes, proposed critical habitat in the action area.
<b>Reptiles</b>				
Narrowheaded gartersnake ( <i>Thamnophis rufipunctatus</i> )	T/pCH	Yes	Yes	Yes, proposed critical habitat in the action area.
<b>Amphibians</b>				
Chiricahua leopard frog ( <i>Rana chiricahuensis</i> )	T/CH	Yes	No	Yes, but not in action area.
<b>Fish</b>				
Loach minnow ( <i>Tiaroga cobitis</i> )	E/CH	Yes	Yes	Yes, in action area.
Roundtail chub ( <i>Gila robusta</i> )				Roundtail chub was proposed for listing at the time of the consultation. However, the proposal was withdrawn, therefore, it is not analyzed further as a T&E species.
Spikedace ( <i>Meda fulgida</i> )	E/CH	Yes	Yes	Yes, in action area.
Species not analyzed in detail, because there is no habitat and/or effect in the action area.				
<b>Mammals</b>				Rationale why dismissed

Common name ( <i>Genus and species</i> )	Legal status	Suitable habitat	Known to occur	Critical habitat
New Mexico jumping mouse ( <i>Zapus hudsonius luteus</i> )	E/CH	No	No	Species and designated critical habitat do not occur within action area.
<b>Reptiles</b>				
Northern Mexican gartersnake ( <i>Thamnophis equis equis</i> )	T/pCH	No	No	Species and proposed critical habitat do not occur within action area.
<b>Fish</b>				
Gila chub ( <i>Gila intermedia</i> )	E/CH	No	No	Species and designated critical habitat do not occur within action area.

<sup>1</sup>Legal status:

- E = Endangered species.
- T = Threatened species.
- P = Proposed species.
- C = Candidate species.
- CH = Critical habitat.
- pCH = proposed Critical habitat.
- EN = Experimental/nonessential.

## Forest Service Sensitive Species

The most recent sensitive species lists for Region 3 provided the basis of the analysis. The lists are reviewed to determine species that may occur on Clifton Ranger District. Table 15 below shows species that are analyzed further, because there is suitable habitat in the action area. Narrative discussion of the sensitive species analyzed in detail follows the table.

**Table 15: Forest Service sensitive species analyzed**

Common name <i>Genus and species</i>	Habitat type	Habitat association	Habitat acres in action area	Known to occur
<b>Birds</b>				
American peregrine falcon <i>Falco peregrinus anatum</i>	Cliffs	Steep cliffs overlooking woodlands, riparian habitats supporting abundant avian prey species. Open expanses. Sonoran, Mohave, and Great Basin desertscrub to Rocky Mountain and Madrean montane conifer forest.	23,036	Yes
Bald eagle <i>Haliaeetus leucocephalus</i>	Riparian, desertscrub, chaparral, mixed conifer, pinyon-juniper, ponderosa pine	Sonoran riparian scrubland, interior strand, desertscrub, Arizona upland, interior chaparral, and Great Basin conifer woodland. Rocky Mountain and Madrean montane conifer. Nests on cliff ledge, rock pinnacle, cottonwood. Found in pinyon-juniper, ponderosa pine, sycamore, willow, and snags.	23,036	Yes
Gray catbird <i>Dumetella carolinensis</i>	Mixed broadleaf deciduous riparian, willow riparian, ponderosa pine, pinyon-juniper	Riparian areas in non-forested woodlands and shrublands. Nests in riparian scrub willow and alder. Ponderosa pine, pinyon-juniper; on dry, shallow, rocky mesas, benches, and canyon walls; non-forest river, riparian woodland, and subalpine marsh. In dense shrubs or vine tangles; abundant in shrub-sapling successional habitat.	23,036	No
Northern goshawk <i>Accipiter gentilis</i>	Deciduous, mixed conifer, ponderosa pine	See discussion in Effects Analysis: Management Indicator Species	30	No

Common name <i>Genus and species</i>	Habitat type	Habitat association	Habitat acres in action area	Known to occur
		Deciduous, coniferous, and mixed forest. Nests in mature or old-growth forest, commonly in ponderosa pine.		
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	Willow riparian, mixed broadleaf deciduous, mesquite, hackberry	See discussion in: Threatened and Endangered Species Analyzed in Detail.	345	Yes
<b>Reptiles</b>				
Narrow-headed garter snake <i>Thamnophis rufipunctatus</i>	Pinyon-juniper, pine-oak, ponderosa pine, mixed broadleaf deciduous riparian with perennial streams	See discussion in Threatened and Endangered Species Analyzed in Detail.	2,284	Yes
<b>Amphibians</b>				
Lowland leopard frog <i>Lithobates yavapaiensis</i>	Cienega wetland	Aquatic systems in desert grassland, pinyon-juniper, rivers, perennial streams, permanent pools in intermittent streams, beaver ponds, cienega wetland, and springs. In debris piles, heads of pools, deep pools with root masses. Shallow water with emergent vegetation for basking, root masses, undercut banks, debris piles for refuge from predators and hibernacula.	392	Yes
<b>Fish</b>				
Desert sucker <i>Catostomus clarkii</i>	Desert to mountain perennial streams	Streams and rivers with rapids and flowing pools with bottoms of gravel and rubble. Elevations 480-8840'.	4,568	Yes
Sonora sucker <i>Catostomus insignis</i>	Desert to mountain perennial streams	Widely distributed from 300-2000m elevation in streams with gravelly or rocky substrate, near undercut banks and/or debris... Water temperature varies from 40-81°F.	4,568	Yes
Roundtail chub <i>Gila robusta</i>	Desert to mountain perennial streams	Found in cool to warm water streams throughout the Colorado River basin. Associated with areas of cover in the form of boulders, overhanging cliffs, undercut banks, or vegetation.	4,568	Yes
<b>Invertebrates</b>				
A caddisfly <i>Lepidostoma apache</i>	Freshwater habitat	Limited information. Adults occupy freshwater habitat. Larval habitat requirements unknown.	4,568	No
A caddisfly <i>Limnephilus granti</i>	Springs and immediate outlets in ponderosa pine	Extremely rare species. Collected specimens have been associated with springs and ponderosa pine.	30	No
<b>Plants</b>				
Greene milkweed <i>Asclepias uncialis</i> ssp. <i>uncialis</i>	Great Basin grassland, Madrean pine-oak, pinyon-juniper	Bare, open patches of soil between clumps of grasses in plains grassland, shortgrass, open pinyon-juniper, open grassland in Madrean evergreen woodland.	14,861	No

Common name <i>Genus and species</i>	Habitat type	Habitat association	Habitat acres in action area	Known to occur
Villous groundcover Milkvetch <i>Astragalus humis- tatus var. crispulus</i>	Ponderosa pine, mixed conifer with frequent fire, pinyon-juniper	Endemic eastern Arizona and western New Mexico. On bare ground and vegetated road cut banks.	30	No
Arizona alum root <i>Heuchera glomeru- lata</i>	Mixed broadleaf decidu- ous riparian forest; mon- tane willow riparian, cot- tonwood-willow riparian	Shaded rocky slopes in humus soils near seeps, streams, and riparian areas.	345	No
<b><i>Sensitive species not analyzed in detail, because there is no habitat and/or effect in the action area.</i></b>				
<b>Birds</b>				
Burrowing owl (Western) <i>Athene cunicularia hypugaea</i>	Grassland, desert scrub	Open, well-drained grassland, steppe, desert, prairie, and agricultural land, associated with burrowing mammals. Great Basin shrub steppe with stands of shrubs, low trees. Chihuahuan desert scrub with creosote bush, large succu- lents.	7,090	No
Baird's sparrow <i>Ammodramus bairdii</i>	Grassland, wet meadows	Shortgrass prairie, scattered low bushes, mat- ted vegetation, native long grass prairie, desert and open grassland, overgrown fields, mixed- oak grassland with oak on the north slope, mixed-grass prairie, wet meadow, and tallgrass prairie.	47	No
<b>Reptiles</b>				
Northern Mexican gartersnake <i>Thamnophis eques megalops</i>	Cienega wetland, oak, de- sert	Riparian, cienega, and marsh in desert grass- land, occasionally in desert and lower oak woodland.	47	No
<b>Amphibians</b>				
Northern leopard frog <i>Lithobates pipiens</i>	Cienega wetlands, and streams	Aquatic habitats that include slow-moving or still water along streams, wetlands, permanent or temporary pools, beaver ponds, and human- constructed habitats such as stock tanks and borrow pits. .	2,284	No
<b>Fish</b>				
Little Colorado sucker <i>Catostomus sp3</i>	Creeks, small to medium rivers, and impoundments	Pools with abundant cover in the mainstem up- per Little Colorado River watershed.	0	No
<b>Invertebrates</b>				
California floater <i>Anodonta cali- forniensis</i>	Cienega wetland	Shallow muddy or sandy large rivers, reser- voirs and lakes. Uses native minnow and intro- duced mosquito fish.	0	No
A caddisfly <i>Lepidostoma knulli</i>	Cool springs, streams and rivers	Larval habitat is cool springs, streams , rivers, and lacustrine habitat	0	No
A stonefly <i>Capnia caryi</i>	High elevation creeks	Limited information. Specimens found in small creeks in high elevations. Due to loca- tion and similar habitat of specimen collection sites, the species may occur in the Wildbunch Allotment.	0	No
Ferris' copper butter- fly <i>Lycaena ferrisi</i>	Wet meadow, cienega	Meadows and cienegas near the food plant <i>Ru- mex hymeospalus</i> .	0	No

Common name <i>Genus and species</i>	Habitat type	Habitat association	Habitat acres in action area	Known to occur
<b>Mammals</b>				
Navajo Mogollon Vole <i>Microtus mogollonensis navaho</i>	Various habitats typically occupying dry grassy vegetation in conifer forests, dense prostrate shrub patches in ponderosa pine, monotypic sagebrush stands, thick grasses in greasewood/ desert-olive stands and juniper stands, shrubby tamarisk thickets. Ground cover vegetation is necessary.	Known range is north of the project area.	0	No
Arizona Montane Vole <i>Microtus montanus arizonensis</i>	Grasslands/meadow habitat	Relict distribution pattern; declines in abundance and distribution due to loss of grassland habitats; requires relatively well-developed grassland/meadow habitat. Distribution does not extend into the action area.	0	No
Springerville silky pocket mouse <i>Perognathus flavus goodpasteri</i>	Gravelly, rocky Areas with sparse vegetation various grasses and forbs. (AGFD 2002b)	Restricted distribution, north of Springerville, AZ. Not restricted to a specific plant association, as long as vegetation structure (sparse understory) is present. In Springerville, associated with shortgrass, boulders and tumbleweeds. Distribution does not extend into action area.	0	No
Western water shrew <i>Sorex palustris</i>	Riparian, mesic forest, and meadow habitats	Extremely restricted, relict distribution. High forest zone. Distribution does not extend in to action area	0	No
White Mountain's ground squirrel <i>Ictidomys tridecemlineatus monticola</i>	Grasslands	Habitat is greatly reduced and restricted. Relict, isolated distribution. Distribution does not extend into action area.	0	No
White Mountain's Chipmunk <i>Neotamias minimus arizonensis</i>	Variety of habitats including coniferous forests, meadows, deciduous hardwood, sagebrush desert.	Restricted distribution. This subspecies is endemic to the higher elevations of the White Mountains of Arizona. Distribution does not extend into action area.	15198	No
Pale Townsend's Big-eared bat <i>Corynorhinus townsendii pallescens</i>	Riparian, Coniferous forest, Pinyon-juniper, desert scrub, wooded areas,	Broad range of habit in elevation and latitude. Roost is caves, mines, rock shelters, under bridges. Avoids open, grazed pastures, but will forage along edges	22,261 7565*	No
Spotted bat <i>Euderma maculatum</i>	Riparian, Coniferous forest, pinyon-juniper, high elevation meadows	Primarily use cliffs, rock crevices for day roosting. Will use abandoned buildings for nocturnal roost Closely associated with riparian habitat.	15,255 7565*	No
Allen's lappet-browed bat <i>Idionycteris phyllotis</i>	Ponderosa pine, Pinyon-juniper, Riparian	Roosts in caves, mines, outcrops, boulder piles	15,255 7565*	No
Western red bat <i>Lasiurus xanthinus</i>	Broad-leaf deciduous forests, riparian	Deciduous riparian habitat. Roost in broad-leaf trees.	344 7565*	No

Common name <i>Genus and species</i>	Habitat type	Habitat association	Habitat acres in action area	Known to occur
<b>Plants</b>				
Arizona phlox <i>Phlox amabilis</i>	Open, exposed areas of limestone or basalt slopes	Endemic to central AZ. Exposed limestone or basalt rocky outcrops within pinyon-juniper and ponderosa pine-gambel oak communities. Range does not extend into action area	0	No
Goodding's onion <i>Allium gooddingii</i>	Mixed conifer with frequent fire, spruce-fir wet mixed conifer	Moist shaded canyon bottom in mature coniferous forest.	0	No
White Mountains paintbrush <i>Castilleja mogollonica</i>	Cienega wetland	Moderately drained, high elevation wet grassy meadow and cienega with perennial or intermittent creeks.	0	No
Gila thistle <i>Cirsium gilense</i>	Spruce-fir wet mixed conifer, montane grassland	Moist areas mountain meadow in montane coniferous forest.	0	No
Yellow lady's-slipper <i>Cypripedium parviflorum</i> var. <i>pubescens</i>	Cienega wetland	Bog, swamp, damp woods, near rivers, canal banks, wet meadows. Also rocky wooded hillsides, moist creek sides, swales in spruce.	47	No
Heathleaf wild buckwheat <i>Eriogonum ericifolium</i> var. <i>ericifolium</i>	Madrean pine-oak, pinyon-juniper, Great Basin and semi-desert grass	Soil composition is not known to be in the project area. White, powdery, gypseous limestone of Tertiary lakebed deposits.	0	No
Wislizeni gentian <i>Gentianella wislizeni</i>	Ponderosa pine, mixed conifer frequent fire, montane grass	High elevation clearing in pine-oak or mixed coniferous forest.	30	No
Arizona sneezeweed <i>Helenium arizonicum</i>	Ponderosa pine	Ponderosa pine; wet bogs, ponds, lakes, and roadside ditches.	30	No
Arizona sunflower <i>Helianthus arizonensis</i>	Ponderosa pine, Madrean pine-oak, pinyon-juniper, Great Basin and semi-desert grassland, chaparral	Dry sandy soils from 4,000 and 7,000 feet.	14,861	No
Mogollon hawkweed <i>Hieracium brevipilum</i>	Mixed conifer frequent fire, spruce-fir wet mixed conifer	Only collected a few times, habitat associations are uncertain. Likely in coniferous forest understory.	0	No
Eastwood alum root <i>Heuchera eastwoodiae</i>	Interior chaparral, Madrean pine-oak, pinyon-juniper, ponderosa pine	Rocky clay slopes on hillsides, along streams in chaparral to ponderosa pine.	23,036	No
Heartleaf groundsel <i>Packera cardamine</i>	Spruce-fir wet mixed conifer	Endemic to mature high elevation spruce-fir.	0	No
Maguire's beardtongue <i>Penstemon linarioides</i> ssp. <i>Maguirei</i>	Pinyon-juniper	Limestone cliffs in pinyon-juniper.	0	No
Davidson's cliff carrot <i>Pteryxia davidsonii</i>	Pinyon-juniper, ponderosa pine, mixed conifer frequent fire	Cool, rocky pinyon-juniper, lower montane coniferous from 6,500 and 8,000 feet. Associated with Morenci Mine area.	0	No
Parish's alkali grass <i>Puccinellia parishii</i>	Cienega wetland	Alkaline seeps, springs, or cienegas from New Mexico to California.	47	No

Common name <i>Genus and species</i>	Habitat type	Habitat association	Habitat acres in action area	Known to occur
Blumer's dock <i>Rumex orthoneurus</i>	Cienega wetland	Mid to high elevation wetland, moist organic soil, perennial springs or streams in canyon or meadow.	47	No
Arizona willow <i>Salix arizonica</i>	Cienega wetland	High elevation wet meadow, stream side, and cienega.	0	No
Bebb's willow <i>Salix bebbiana</i>	Mixed broadleaf deciduous riparian, montane willow, cottonwood willow	Along riverbank, streambank, overflow channel, and seeps from chaparral to high elevation coniferous forest.	0	No
Mogollon clover <i>Trifolium longipes</i> <i>ssp. Neurophyllum</i>	Cienega wetland, mixed broadleaf deciduous Riparian, montane willow	Wet meadow, spring, and riparian corridor in montane coniferous forest from 6,500 to 9,000 feet.	297	No

## Migratory Bird Species

**Table 16: Migratory Bird Species**

Species	Vegetation composition and structure	Abiotic landscape factors	Known to occur?
<b>Pinyon-juniper</b>			
Gray flycatcher	Larger pinyon-juniper, open ponderosa, sagebrush, greasewood, ground cover to support insects for foraging.	Mid to late successional, 4500-7500 feet.	Yes
Pinyon jay	Pinyon-juniper, ponderosa pine. Nests in bottom half of canopy.	Mid to late successional, nests on warmer south side; 5000-7500 feet.	Yes
Gray vireo	Open pinyon-juniper, broad-leafed shrubs, Utah serviceberry, and single-leaf ash.	Rocky and drier canyon/mesa, steep slopes; 3200-6800 feet.	Unknown
Black-throated gray warbler	Heavy conifer cover, tall dense pinyon-juniper, also Madrean oak/pine oak.	Pinyon-juniper woodlands with interspersed shrubby openings, 6500-8000 feet.	Yes
<b>Desert grasslands</b>			
Golden eagle	Forages in large open desert scrub/grasslands to open conifer.	Large open areas to forage, tall cliffs or canyons to nest; 1300-9000 feet.	Yes
Zone-tailed hawk	Open habitats near riparian areas. Nests in tall Freemont cottonwoods, Arizona sycamores.	Breeding range expanding North; 1780-7800 feet.	Yes
Cassin's sparrow	Tall grass, scattered low shrubs, desert grassland. Breeds abundantly in native grasses.	Ungrazed to lightly grazed habitat; 2200-5600 feet.	Unknown
Northern harrier	Open wetlands, grasslands, and agriculture. May forage over desert grasslands.	Irrigated pastures, forage from fence posts and rocks; 1300-7000 feet.	Unknown
Crissal thrasher	Dense shrub drainages, thickets, desert riparian drainages with cottonwood-willow.	Mountain foothill drainages and canyons, 1000-6400 feet.	Unknown

Species	Vegetation composition and structure	Abiotic landscape factors	Known to occur?
Grasshopper sparrow	Tall bunchgrass, turf grass, or sod grass.	Periodic fire to suppress brush; 3000-5000 feet.	Unknown
Swainson's hawk	Expansive grassland, sparse shrublands with open woodlands; scattered tree clumps for roosting, nesting and perching.	Nests in trees, utility poles, and windmills; 4900-9500 feet.	Unknown
Burrowing owl	Grasses, early succession plants, rock outcrops with burrowing mammals.	Dry, open, treeless, early successional shortgrass plains with burrowing mammals, 4900-7000 feet.	Unknown
<b>Riparian</b>			
Western yellow-billed cuckoo	See TES	See TES	See TES
Southwestern willow flycatcher	See TES	See TES	See TES

## Environmental Effects to Wildlife Species

This section documents the projected effects to species of wildlife, drawn from the lists above, which are considered as present in the project area for the purposes of this analysis. Further detail on the analysis and current status of these species in the project area can be found in the wildlife specialist's report and Biological Opinion received from the US Fish and Wildlife Service, both located in the project record.

### *Threatened and Endangered Species- Effects of Alternative 1*

#### **Predators (Mexican wolf and Mexican spotted owl)**

Elimination of livestock grazing would increase upland grass and shrub cover, improving forage and cover availability for prey species, including small mammals, passerine birds, mule deer, and elk. Although there is no grazing on the Blue or San Francisco rivers or associated riparian areas, removal of livestock would eliminate water diversion. This would improve in riparian vegetation and prey habitat capability. Mexican spotted owl would further benefit from increased recruitment of woody riparian vegetation that would provide nesting, roosting, foraging, and dispersal habitat. Removal of livestock could result in an increase in acres of connected habitat along the Blue and San Francisco Rivers where wolves may disperse with reduced potential for livestock conflicts.

#### **Riparian species (Southwestern willow flycatcher and Western yellow-billed cuckoo)**

Improvements to riparian habitat under Alternative 1 would be minimal because livestock are already excluded from the Blue River and San Francisco River, these rivers being the primary riparian areas that contain sufficient habitat for these species. Other riparian reaches on the allotment, where livestock may have access, likely do not have the potential to develop appropriate nesting habitat because of geography such as canyon confinement and gradient creeks with only seasonal water. Some improvements to riparian areas may occur if water diversion for tanks and troughs is eliminated. With no livestock in pastures adjacent to riparian areas the occurrence of brown-headed cowbird parasitism would be largely eliminated.

#### **Aquatic species (Narrow headed gartersnake, Chiricahua leopard frog, Loach minnow, and Spikedace,)**

Although livestock are excluded from the primary riparian habitat of the allotment, which occurs along the Blue and San Francisco River, removal of livestock from the area under alternative 1 would contribute to improved habitat elsewhere in the action area. The removal of livestock from the allotment would allow recovery of woody and herbaceous riparian obligate species, with certain species and age classes expected to

improve in 5 to 10 years. Water quality would improve because of less sedimentation, lower water temperatures from shading by vegetation, less input of nutrients, and increased bank stability. This would benefit aquatic species by increasing macroinvertebrate species richness and biomass, improving the potential prey base, as well as by improving spawning habitat (Belsky et al. 1999). All riparian areas, including those excluded, would benefit if water was no longer diverted for livestock use. Across the allotment there would be a gradual return to a more natural hydrology, creating less water impoundments and improving natural water distribution. This would contribute to an improvement in aquatic habitats for all aquatic species, particularly spawning habitat. The improvement in soil condition and subsequent water quality would occur more rapidly than with alternative 2.

### *Forest Service Sensitive Species- Effects of Alternative 1*

There would not be any expected direct, indirect, or additional cumulative adverse effects to any of the Forest Service Sensitive Species if this alternative is implemented. All of the analyzed sensitive species would be expected to benefit indirectly and/or directly through improved habitat capability and availability by the selection and implementation of alternative 1.

Removal of livestock from the Wildbunch Allotment would allow recovery of woody and herbaceous riparian obligate species. This would increase nesting and foraging and likely enhance recruitment of future mature roosting and nesting trees. An increase in water quality through an improvement in upland habitat conditions may result in improved prey foraging habitat for some species. With no livestock associated activities, such as trailing across the Blue River for shipping, there would be less likelihood for disturbance to any of the FS sensitive species. Removal of livestock would also eliminate trampling risk, and for Sensitive plants also the risk of grazing. Both wildlife and plants would benefit from no longer diverting water for livestock use.

### *Threatened and Endangered Species- Effects of Proposed Action*

#### **Effects on the Mexican wolf**

##### *Direct Effects/Indirect Effects:*

By authorizing livestock on the allotment, wolf and livestock interactions remain a possibility if wolves were to occur on the east side of the Clifton Ranger District. The ongoing management practice of year round calving can draw wolves into the area (Oakleaf et al. 2003). Water development maintenance and improvements with improved upland riparian conditions may provide habitats to increase mule deer densities that may attract wolves.

Indirect effects may also occur resulting from livestock use of plants that provide habitat for native wolf prey, including elk, Coues white tail deer, and mule deer may reduce the number of wild ungulates that might be present on the allotment. Under the Proposed Action, maximum allowable use levels would dictate pasture moves to allow adequate plant residual to remain and these moves are based on critical (riparian) areas such that upland key areas would typically have a lower level of use. Nonuse periods span from 7 to 24 months in the main pastures, except for the smaller Horse and Little pastures. These actions would provide more residual herbaceous and shrub cover for prey forage and cover needs versus current management. If denning is found to occur on the allotment, coordination on livestock management activities would occur to minimize disturbance to wolves while ensuring permittee access.

##### *Cumulative effects*

Cumulative effects for listed species include future State, tribal, local, and private actions that are reasonably certain to occur in the action area. Thus, cumulative effects are specific to management policies on the San Carlos and White Mountain Apache Reservations. The San Carlos Apache Reservation requires trapping and removal of any wolves that may move onto their land, while the White Mountain Apache Reservation allows wolves to establish territories on their land, but has removed a pack in the past.

### *Determination of effect*

The effect of this project on the Mexican wolf considers the following information:

1. The reintroduced Mexican wolf population has been designated as a non-essential experimental population. By definition, a non-essential experimental population is not essential to the continued existence of the species; therefore, proposed livestock grazing and livestock management activities in the area with the Mexican wolf are not likely to jeopardize the continued existence of the species.
2. The FWS has established a non-regulatory Mexican wolf Interdiction Program to address wolf-livestock issues, administered through the National Fish and Wildlife Foundation. The goal of the program is to prevent or mitigate depredation and nuisance effects on local stakeholders through voluntary interdiction, incentive, and compensation programs.
3. In instances where proposed livestock grazing and livestock management activities may adversely affect the Mexican wolf; i.e. if conflicts between the timing and location of livestock calving and calf depredations (depredation that is other than incidental) by Mexican wolves already residing in a specific reintroduction area occurs or is anticipated, it is strongly recommended that USFS personnel and affected livestock permittees work with the Mexican wolf field team to arrive at a solution.
4. In order to maintain forage and habitat for Mexican wolf prey species, forage utilization will be monitored and maintained at conservative levels.

Based on the discussion above, it has been determined that the implementation of the Proposed Action is **Not Likely to Jeopardize the Continued Existence** of the Mexican wolf.

### **Effects on the Mexican spotted owl and critical habitat**

#### *Direct Effects/Indirect Effects:*

The Mexican Spotted Owl Recovery Plan (USDI 2012b) states that improperly managed grazing can adversely affect Mexican spotted owls primarily through indirect effects. Therefore, livestock management within owl habitat should be designed to maintain or enhance prey availability, to maintain potential for beneficial surface fires while inhibiting potential for destructive stand-replacing fire, and to promote natural and healthy riparian, meadow, and upland plant communities including their functional processes.

The Forest Service follows a framework based on the following criteria to support a “may affect, not likely to adversely affect” determination on Mexican spotted owls for livestock grazing activities. The livestock grazing activity must meet criteria 1 – 3 below:

1. *In the action area, livestock grazing or livestock management activities will occur within protected activity centers, but no human disturbance or construction associated with the livestock grazing will occur in protected activity centers during the breeding season.* Regarding this criterion, no protected activity centers occur in the allotment, so no activities associated with livestock grazing will occur in protected activity centers during the breeding season.
2. *Livestock grazing and livestock management activities within protected activity centers, within the action area, will be managed for levels that provide the woody and herbaceous vegetation necessary for cover for rodent prey species, the residual biomass that will support prescribed, natural, and ignited fires that would reduce the risk of catastrophic wildfire in the Forest, and regeneration of riparian trees.* Again, no protected activity centers occur in the allotment.
3. *In owl foraging areas, forage utilization will be maintained at conservative levels.* Regarding this criterion, the proposed grazing plan is based on conservative forage utilization levels throughout the allotment.

Because the proposed grazing plan adheres to the criteria above, we determine that the Proposed Action would not have a significant effect on the Mexican spotted owl.

### *Cumulative effects*

Juvenile owls can disperse up to 46 miles away (Ganey et al. 1998), so the boundary for cumulative effects for this species extends into the San Carlos and White Mountain Apache Reservations, the Gila National Forest, as well as into State, BLM, and private lands to the south and east of the allotment. Grazing allotments, wild and prescribed fires, roads, and mining operations may affect Mexican spotted owls dispersal and prey, limit habitat for roosting or foraging juveniles, or for winter foraging habitat.

#### *Effects on Designated Critical Habitat of the Mexican Spotted Owl*

While grazing could adversely impact the constituent elements of critical habitat related to forest structure in Madrean pine-oak woodland through altered susceptibility to high severity crown fires (USDI 1995a), we do not expect this to occur due to the Proposed Action. Conservative grazing levels reduce pressure on herbaceous vegetation and allow for continued presence of the beneficial low-intensity ground fires. Therefore, we expect that grazing of herbaceous vegetation as proposed will not lead to destructive crown fires that can degrade the quality of forest structure constituent elements of critical habitat.

Much of the riparian habitat within the allotment is inaccessible to livestock. Riparian habitat along the Blue and San Francisco rivers and within the Horse pasture would be excluded from grazing. Riparian habitat in the weaning trap would be grazed only as livestock are weaned and rested the remainder of the year. Riparian habitat in the Indian trap would be grazed only as livestock are herded and rested the remainder of the year. We expect the proposed conservative forage utilization standards would allow for maintenance of forest structural complexity (Zwartjes et al. 2005) and would have only minor effects to constituent elements of critical habitat related to forest structure. When considered alongside expected maintenance and possible improvement to vegetation under the Proposed Action, we expect an insignificant effect on Mexican spotted owl designated critical habitat.

#### *Direct and indirect effects to maintenance of adequate prey species for designated Mexican spotted owl Critical Habitat*

Grazing that takes place in upland, meadow, and riparian habitats has the potential to adversely impact constituent elements of critical habitat related to maintenance of adequate prey species (USDI 1995). However, the conservative forage utilization standard proposed for the allotment is expected to provide adequate levels of residual plant cover for Mexican spotted owl prey species. This level of utilization should allow plant regeneration and maintain fruits and seeds used as forage by small mammals. Overall, given implementation of the proposed conservative forage utilization standards, we expect an insignificant effect on Mexican spotted owl habitat regarding the maintenance of adequate prey species.

#### *Determination of effect: Conclusions*

The effects of this project **on the Mexican spotted owl** taken into consideration the following information:

1. No Mexican spotted owl protected activity centers occur within the allotment, so there will be no effect to Mexican spotted owl protected activity centers.
2. There are no known populations of Mexican spotted owl in the project area, although suitable habitat does exist.
3. Proposed action management and conservation measures are in place. In the event that conservation measures do not accomplish site specific resource objectives, additional optional measures may be implemented. Field surveys for federally threatened or endangered species will be conducted prior to extensive reconstruction of existing improvements, or the construction of new range improvements. Adjustments will be made in the location of improvements or the timing of construction, as appropriate, in order to avoid adverse effects to these species. Consultation with the US Fish and Wildlife Service will be conducted as appropriate.

The effects of this project **on Mexican spotted owl Critical Habitat** consider the following information:

1. The Mud Springs Canyon area is designated critical habitat and designated restricted habitat, however, it does not contain all necessary constituent elements of critical habitat.
2. Proposed action conservation measures are in place to manage for conservative utilization rates of 30 to 40% in Mexican spotted owl recovery habitat in upper Mud Springs Canyon pastures.
3. Riparian habitat occurs along intermittent reaches and springs of canyon bottoms. Steep slopes (> 40%) prevent livestock from accessing some riparian habitat. Conservative woody browse utilization of 35% of terminal leaders are part of the Proposed Action for riparian areas.
4. Conservative forage utilization guidelines will allow for adequate amounts of herbaceous vegetation to allow low-intensity ground fires, and reduce the risk of fuel accumulations that develop into high-intensity crown fires.
5. Conservative forage utilization standards are expected to provide adequate levels of residual plant cover to allow for plant regeneration and maintain fruits and seeds used as forage and seed sources for Mexican spotted owl prey species.

Based on the analysis above, the appropriate determination for effects of the Proposed Action on the allotment is **May Affect, Not Likely to Adversely Affect** for the Mexican spotted owl and its designated Critical Habitat. If Mexican spotted owls are found, the District would work with the USFWS to delineate protected activity center boundaries and the permittee to manage livestock in the presence of those individuals. Section 7 consultation would be reinitiated, if needed.

### **Effects on the Southwestern Willow Flycatcher and Critical Habitat**

#### *Direct and indirect effects*

There would be no direct effect to the species or to its nesting and migratory habitat along the Blue and San Francisco Rivers, because livestock are excluded from these areas. A slight effect to riparian areas may occur because of water diversion for tanks and troughs, but this amount is expected to be negligible. Because of the grazing rotation plan, livestock would be present in some pastures adjacent to these rivers during the Southwestern Willow Flycatcher's breeding season. The proximity of grazing livestock to these areas could contribute to nest failure due to brown-headed cowbird parasitism.

#### *Cumulative effects*

Because of migration patterns the cumulative effect boundary extends beyond the boundary of the action area. Additional effects to these species include riparian degradation along migration routes from water diversions, groundwater pumping, channelization, bank stabilization, removal of vegetation along streams, canals, and ditches, livestock grazing, fire, recreation, as well as urbanization (USDI 2002a). These effects can be found on Federal, State, Tribal and private lands in the range of the Southwestern Willow Flycatcher.

The Forest Service provides a framework based on the following criteria to support a "May affect, not likely to adversely affect" determination for livestock grazing activities. The livestock grazing activity must meet all three criteria below:

1. *Grazing activities in the action area do not measurably or detectably reduce the suitability or regeneration of Southwestern Willow Flycatcher habitat.* Regarding this criterion, the action area is more than 50 miles from the nearest known area that is occupied by Southwestern Willow Flycatcher in the Alpine Ranger District Horse Pasture. Livestock are excluded from the riparian areas along the Blue and San Francisco Rivers, which is designated critical habitat. Grazing activities do not reduce the suitability or regeneration of Southwestern Willow Flycatcher habitat in the action area.
2. *Indirect effects occurring within the action area resulting from livestock grazing on the allotment are determined to be insignificant or discountable.* Regarding this criterion, the indirect effects from livestock grazing in the action area are discountable because livestock are excluded from the Southwestern Willow Flycatcher critical habitat along the San Francisco River.

3. *Livestock grazing should comport with or be more conservative than the descriptions provided in Table 2, Appendix G of the 2002 USFWS Southwestern Willow Flycatcher final recovery plan.* Regarding this criterion, the livestock grazing as proposed comports with, and is proposed at mostly more conservative rates than the recommendations in the USFWS' final recovery plan Southwestern Willow Flycatcher.

#### *Determination of effect*

The Proposed Action would have no effect to developing riparian vegetation, because livestock are excluded from both the Blue and San Francisco Rivers, and water diversion would be minimal. There would be the potential for a slight increase in brood parasitism where livestock are grazing in pastures adjacent to the rivers if the Southwestern Willow Flycatcher is present. This Proposed Action will result in a **May Affect, Not Likely to Adversely Affect** determination for the Southwestern Willow Flycatcher. Because associated critical habitat is fenced off along the San Francisco River, it has been determined that the continued grazing on the allotment will have **No Effect** on designated **Southwestern Willow Flycatcher Critical Habitat**.

#### **Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) and Proposed Critical Habitat**

##### *Direct and indirect effects*

There would be no direct effect to the Western yellow-billed cuckoo or to nesting or migratory habitat along the Blue and San Francisco Rivers, because livestock are excluded from these areas. The elimination of livestock grazing along riparian corridors restored the riparian woodland understory, increased cottonwood and willow saplings, reduced salt cedar establishment, and increased the local breeding population of this species (Kreuper et al. 2001). Reduced grazing pressure through conservative forage utilization standards will allow for structural complexity to be maintained and vegetation to continue developing in riparian habitat. A slight effect to riparian areas may occur because of water diversion for tanks and troughs, but this amount is expected to be negligible. Because of the grazing rotation plan, livestock would be present in some pastures adjacent to these rivers during Western yellow-billed cuckoo breeding season. The proximity of grazing livestock to these areas could contribute to nest failure due to brown-headed cowbird parasitism.

##### *Cumulative effects*

Because of migration patterns, the cumulative effect boundary extends beyond the boundary of the action area. Additional effects to these species include riparian degradation along migration routes from water diversions, groundwater pumping, and channelization, and bank stabilization, removal of vegetation along streams, canals, and ditches, livestock grazing, fire, recreation, and urbanization (USDI 2002a). These effects can be found on Federal, State, Tribal and private lands in the range of the Western yellow-billed cuckoo.

#### *Determination of effect*

The Proposed Action would have no effect to developing riparian vegetation, because livestock are excluded from both the Blue and San Francisco Rivers, and water diversion from the Proposed Action would be minimal. There would be the potential for a slight increase in brood parasitism where livestock are grazing in pastures adjacent to the rivers if the Western yellow-billed cuckoo is present. This alternative is **May Affect, Not Likely to Adversely Affect** Western yellow-billed cuckoo and is **Will Not Adversely Modify Proposed Critical Habitat**.

#### **Effects on the Narrow-headed gartersnake and proposed critical habitat**

##### *Direct and indirect effects to species*

Direct effects to gartersnakes are not expected to occur within the Blue or San Francisco Rivers due to continued livestock exclusion. Effects could occur during movement of livestock across Juan Miller Crossing twice a year, but are considered unlikely. Livestock are trailered across the Blue River using the Juan Miller

Road (FS road 475) unless water levels are high, then livestock walk or swim across. Because this occurs only twice a year, the potential for adverse effects is considered insignificant and discountable.

Properly managed livestock grazing is not likely to pose a significant threat to the snake. Riparian habitats can be impacted by livestock grazing when high densities of ungulates are attracted to natural water sources. This can result in the degradation or elimination of dense herbaceous vegetation, increase erosion of banks and shorelines leading to increased siltation, as well as potentially increasing pollutants from animal wastes (Zwartjes et al. 2005). These effects may not pose a direct significant threat to narrow-headed gartersnakes but they can impact the gartersnake prey base, or cause increased stress to snakes.

Six perennial streams or reaches of streams occur within the allotment that could support fish. These streams may disproportionately attract livestock to the drainage during sensitive growing season periods resulting in reduced vegetation cover and increased siltation into those perennial areas. This could affect fish populations resulting in a reduced prey base for the narrow-headed gartersnake. To alleviate grazing pressure within sensitive drainages, trick tanks are proposed for construction. These additional water sources should alleviate some pressure on the drainages and keep the majority of grazing in upland areas.

Indirect effects to the species include increased sedimentation and alteration of the native fish prey base. Riparian areas that livestock can access may demonstrate bank sloughing and sedimentation, which may affect fish prey base for the species downstream in the Blue or San Francisco Rivers. Rest-rotation of pastures, enforced utilization standards, and close monitoring of critical areas in non-excluded riparian areas are expected to minimize sedimentation and effects to fish prey base to the point where they are immeasurable. Indirect effects may include some reduced overland flow to rivers from the construction of the new tanks and troughs, but tanks and troughs would not divert a large amount of water, so indirect effects from construction are expected to be slight.

### ***Effects to Proposed Critical Habitat***

#### *Direct and Indirect Effects to Stream Habitat*

Both the Blue and San Francisco Rivers are perennial streams are excluded from livestock grazing by either fencing or topography. No effects to the drainages by decreasing protective cover and affecting stream banks or habitat is expected to occur due to the exclusion.

#### *Direct and Indirect Effects to Terrestrial Space*

Due to the exclusion of proposed critical habitat, no reductions in structural complexity for the snake's life history needs are expected to occur. The Proposed Action continues the exclusion of the Blue and San Francisco rivers, which would negate any loss of vegetation and maintain structural components within the Critical Habitat.

#### *Direct and Indirect Effects to Prey Base*

Native fish populations can be negatively impacted by livestock grazing. Unmanaged, livestock can compact soils and remove vegetation resulting in increased sedimentation into streams. This can increase water temperatures and decrease habitat quality for the fish. The Proposed Action includes conservative utilization levels, which would minimize the amounts of vegetation removed and in turn reduce erosion and sedimentation impacts to downstream fish populations. In addition, the development of upland watering systems within multiple pastures is designed to alleviate use within any riparian corridors outside the Blue and San Francisco Rivers, further protecting downstream fish species.

#### *Direct and Indirect Effects Resulting in Nonnative Species*

Livestock grazing has been associated with increased transfer and recruitment of nonnative species into aquatic habitats. No transfer of water or species is part of the Proposed Action and tank surveys following

the Chiricahua leopard frog Recovery Plan prior to tank cleaning would identify and potential nonnatives. The Proposed Action will not increase the presence of nonnative aquatic predators in streams or stock tanks.

#### *Cumulative effects*

Cumulative effects for this species includes grazing on other allotments, prescribed fire or wildfire, ground-water pumping, recreation, and other activities that may contribute to increased sedimentation that alters water quality and habitat. These actions can indirectly affect this species through alterations to habitat; including elevating stream substrate embedment, decreasing streambank stability, increasing water temperature, and degraded streamside riparian condition. These effects may result in disturbance or mortality of individuals. Activities for native fish restoration, including non-native fish removal in the Blue River would benefit the species.

#### *Determination of effect*

The Proposed Action may affect individuals, but would have minimal effect due the exclusion of livestock from both the Blue and San Francisco River, rest-rotation use of pastures, and conservative utilization guidelines. The Proposed Action is **May Affect, Not Likely to Adversely Affect** the narrow-headed garter-snake and is **Not Likely to Adversely Modify Proposed Critical Habitat**.

### **Effects on the Chiricahua leopard frog**

#### *Direct and indirect effects*

The direct and indirect effects of the Proposed Action on the Chiricahua leopard frog are described in terms of the criteria that are put forth by the Forest Service framework for streamlining informal consultation for livestock grazing activities (USDA 2015). A May Affect, Not Likely to Adversely Affect determination must meet all of the criteria that are discussed below.

1. *There will be no livestock use or livestock management activities where the species is reasonably certain to occur or there is occupied aquatic habitat (grazing is allowed in non-occupied suitable habitat).* Chiricahua leopard frog could reasonably occur in suitable streams, stock tanks and springs in every pasture on the Wildbunch Allotment. Only the Blue and San Francisco Rivers are excluded from livestock grazing, all other suitable habitats are not. Although the Blue and San Francisco Rivers are excluded from grazing, all unprotected riparian areas, springs, and stock tanks in the Wildbunch Allotment under the Proposed Action could be grazed during the breeding season (March through August) at some time during the rotation.
2. *Indirect effects occurring within the action area, where the frog is reasonably certain to occur, which result from upland livestock grazing are determined to be insignificant or discountable.* Indirect effects of livestock grazing include degraded water quality, alteration of vegetation and riparian bank structure, reduced cover, and increased risk of disease transmission (Fleischner 1994, Belsky et al. 1999). Riparian habitats can be impacted by livestock grazing when high densities of ungulates are attracted to natural water sources. This can result in the degradation or elimination of dense herbaceous vegetation, increase erosion of banks and shorelines leading to increased siltation, as well as potentially increasing pollutants from animal wastes (Zwartjes et al. 2005).

The Proposed Action includes construction of new water storage tanks and troughs as well as fencing. More storage tanks can cause decreased stream flows, eliminate or reduce backwater pools used for reproduction, increase stream temperatures, and reduce dissolved oxygen levels. The water diverted for this project would be small enough to result in only insignificant effects. Indirect effects from changes in sedimentation may occur. If Chiricahua leopard frog are present sediment inputs to riparian areas can affect egg survival. Implementation of the Proposed Action is expected to increase ground cover and soil stability in the uplands thus leading to reduced sedimentation in aquatic habitats.

Maximum allowable use levels in critical riparian areas may dictate a pasture move, although if management can redistribute livestock, as with extra and frequent herding and holding efforts, into areas in that pasture at less than the maximum allowable use level, demonstrating that they can be kept in these areas, then livestock may remain in the pasture uplands longer. Based on movement out of the pasture, or at least the riparian areas, coupled with periods of nonuse in the main pastures from 7 to 24 months, effects to riparian vegetation would be reduced. To alleviate grazing pressure, trick tanks are proposed across the allotment. These additional water sources should alleviate use of drainages and springs. However, these effects cannot be considered discountable.

3. *Proposed livestock management activities, within the action area, will not increase the likelihood that non-native predators or chytrid fungi will colonize or be introduced to such aquatic sites.* Proposed management activities will not increase the likelihood of nonnative species or spread of chytrid fungus. Non-native species are only known from the Blue and San Francisco Rivers and bullfrogs are not present. Management activities would not increase the likelihood of non-native species establishing within the allotment. Chytrid fungus is present on lowland leopard frogs in the adjacent Dix Creek. However, precautions to reduce the risk of chytrid fungus during stock tank cleaning (e.g. drying of equipment and no transference of water) is standard on the Forest. Many of the livestock waters are trick tanks, which do not require cleaning out, further reducing the risk of spreading chytrid fungus.

#### *Cumulative effects*

Cumulative effects for this species includes grazing on other allotments, prescribed fire or wildfire, ground-water pumping, water diversion, recreation, and other activities that may contribute to increased sedimentation that alters water quality and habitat. Cumulatively, these actions can indirectly affect this species through alterations to habitat; including elevating stream substrate embedment, decreasing streambank stability, increasing water temperature, and degraded streamside riparian condition. These effects may result in disturbance or mortality of individuals. Activities for native fish restoration, including non-native removal, in the Blue River would benefit the species. Other cumulative effects for Chiricahua leopard frog include nonnative aquatic species which have been identified as a contributing factor in the decline of Chiricahua leopard frog populations across its range (Sredl and Jennings 2005). Both the San Francisco and Blue Rivers contain a number of predaceous nonnative species; including crayfish, channel and flathead catfish, carp, and bullfrogs. Chytrid fungus may be present in some water bodies in the three primary watersheds discussed above. It can be spread between water bodies by humans, livestock, and native terrestrial wildlife.

#### *Determination of effect*

Based on the proximity of known populations to the south of the allotment and the populations within the Blue River, it is reasonable to assume that Chiricahua leopard frog currently do or will occur on the Wildbunch Allotment during the 10 years of the Proposed Action. It is also expected that riparian recovery outside of riparian exclosures would not be complete in the 10 years of the Proposed Action. There are 238 acres of riparian habitat on the Wildbunch Allotment that could potentially be occupied. Given the analysis above, the criteria for a not likely to adversely affect cannot be met. Therefore, the Proposed Action **May Affect, Likely to Adversely Affect** the Chiricahua leopard frog. There will be **No Effect** on Chiricahua leopard frog designated Critical Habitat, because there is no designated Chiricahua leopard frog critical habitat in the Wildbunch Allotment. USFWS concurred with this determination, and further concluded in their biological opinion that this action is **unlikely to jeopardize the continued existence** of the Chiricahua leopard frog.

If Chiricahua leopard frog are found in the future or stocked, the ASNFs would work with the USFWS and the permittee to manage livestock in the presence of that population. Section 7 consultation would be reinitiated if needed.

### **Effects on the Loach minnow, the Spikedace, and their critical habitat**

Based on similar expected outcomes and habitat requirements, the effects analyzes for these species are summarized together.

#### *Effects Analysis Criteria and Measures*

The action area for this analysis includes the affected allotments and also includes connected drainages for up to ten miles below the allotment boundaries for effect considerations. The USDA Forest Service provides a framework for streamlining informal consultation for livestock grazing activities. The 2015 framework suggests criteria for a "NLAA" determination, which could not be met for loach minnow but could be applied to spikedace for this analysis. The livestock grazing activity must meet all criteria below:

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

1. Evidence suggests that there is reason to believe listed aquatic species are reasonably certain to occur in the action area,
2. Direct effects to listed fish will be avoided by yearlong exclusion of livestock from occupied TEP species habitats in the action area,
3. Indirect effects to listed fish occurring within the action area which result from upland livestock grazing are determined to be insignificant or discountable.

#### *Direct and indirect effects*

Direct effects to streambanks and spawning habitat are not expected to occur, because livestock are excluded from both the Blue and San Francisco Rivers. Direct effects may occur during movement of livestock: Timing for livestock movement occurs in the spring and fall, and takes between 2 and 4 days to complete. Livestock are moved across the Blue River using the Juan Miller Road (FS road 475). They are primarily moved in trailers, but livestock swim across if the river is too high. Management would mitigate these effects by limiting trailing to twice a year, and these effects only lasting from 2 to 4 days. Effects are minimized by using FS road 475 to cross the Blue River and by moving the livestock primarily by trailer. The use of a trailer limits the potential for any effects to occur off the road. A trailer would not be used if the Blue River is too high to drive across. Spawning conditions would not be ideal during high flows, which would limit direct effects of trailing.

Indirect effects to both species and their designated critical habitat from livestock grazing throughout the Wildbunch Allotment include elevated sediment and nutrient loading from grazing effects to non-excluded stream corridors and adjacent uplands. Indirect effects may alter critical habitat constituent elements by increasing suspended sediments to affect water quality, specifically increased levels of fines and embedded sediments in the interstitial spaces of larger substrates, as well as the insect food base. These alterations of critical habitat may lead to unsuccessful spawning or recruitment from lack of available habitat and lowered food base. The short lifespan of the loach minnow, coupled with the comparatively low fecundity of the species and small populations makes it vulnerable to adverse effects from activities which may only effect the species' habitat for relatively short time periods, especially during spawning season. Spikedace also have a short lifespan of 1-2 years that also makes it especially vulnerable to adverse effects.

Critical habitat primary constituent elements 1b, 2 and 3 were significantly impacted either during or shortly after the Wallow Fire in Blue River and San Francisco Rivers with emphasis on the section of river in the vicinity of Grant Creek and continuing downstream. Current effects to primary constituent elements 1b and 2 of loach minnow and spikedace critical habitat include ongoing high levels of fines in Blue River in the vicinity of KP Creek and continuing downstream for an unknown distance. The remaining critical habitat constituent elements have little to no potential to be impacted by the Proposed Action. Adaptive management is expected to mitigate or lessen these effects in a number of ways. Exclusion from riparian habitats decreases the likelihood that trampling of adult fish, fry, or eggs would occur. Proposed management of

rest-rotation, utilization standards, and critical areas should reduce livestock effects in a given pasture, allow for adequate herbaceous cover to slow runoff, and minimize sedimentation.

#### *Cumulative effects*

Cumulative effects for this species includes grazing on other allotments, ash flow from wildfire, groundwater pumping, water diversion, recreation, and other activities that may contribute to increased sedimentation that alters water quality and habitat. Cumulatively, these actions can indirectly affect this species through alterations to habitat; including elevating stream substrate embeddedness, decreasing streambank stability, increasing water temperature, and degraded streamside riparian condition. These effects may result in disturbance or mortality of individuals. Activities for native fish restoration, including non-native removal in the Blue River would benefit the species.

#### *Determination of effect*

Loach minnow, spikedace, and their designated critical may be directly and indirectly affected. These effects are not insignificant or discountable because of the current environmental baseline post-fire and current sedimentation from streams within Wildbunch Allotment to occupied critical habitat based on riparian surveys. The criteria for a not likely to adversely affect determination could not be met based on the guidance criteria. Therefore, based on the analysis above, the Proposed Action **May Affect, Likely to Adversely Affect** loach minnow and spikedace and their designated critical habitat.

USFWS concurred with this determination, and further concluded in their biological opinion that this action is **unlikely to jeopardize the continued existence** of the loach minnow and spikedace.

### *Forest Service Sensitive Species- Effects of the Proposed Action* **Effects on the Bald eagle and Peregrine falcon**

#### *Direct & Indirect Effects*

There would be no direct effects to the species foraging, roosting, or nesting habitat along the Blue and San Francisco Rivers, because livestock are excluded from these areas. Livestock carcasses have been observed on the Wildbunch Allotment with this grazing and calving operation. These would be scavenged upon by bald eagles. Under the Proposed Action, maximum allowable use levels and extended nonuse periods in pastures would help provide more residual herbaceous cover for small mammal prey forage and cover needs. Improvements in upland watershed and soil conditions from increased ground cover would contribute to improvements in watershed condition and water quality, and also to improvements in aquatic and riparian habitats. Improvements on the Wildbunch Allotment may not be major at the 5<sup>th</sup> code watershed level scale per the watershed/soil specialist's report in the project record.

#### *Cumulative Effects*

The species who winter and breed in the southwest extends northward as far as Saskatchewan, extending the cumulative effect boundary well outside the action area. Additional effects to the species include shooting and trapping, pesticides, ingestion of lead and plastic, degradation of wintering and summering habitat, and disturbance at roost sites among other things. These effects can be found on Federal, State, Tribal and private lands in the U.S. portion of the range of the species.

#### *Determination of Effects*

With exclusion of livestock use along the Blue River and San Francisco River and the Wildbunch Allotment representing only 8% of the Lower Blue River Watershed, as well as only 3% of the Mule Creek/San Francisco Watershed, we conclude that the Proposed Action is **not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing.**

## **Effects on the Gray catbird**

### *Direct & Indirect Effects*

There would be no direct effects to the species or habitat along the Blue River and San Francisco River because livestock are excluded from these areas. There is the potential for indirect effects to habitat, because livestock would be present in adjacent pastures.

### *Cumulative Effects*

Cumulative effects for this species extend beyond the immediate action area because of migratory and habitat needs. Effects to riparian areas along the Blue and San Francisco River would effect this species, but negative effects are not expected to be substantial.

### *Determination of Effects*

With the primary nesting and migratory habitat along the Blue and San Francisco Rivers being excluded from livestock use, we conclude that the Proposed Action is **not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing.**

## **Effects on the Lowland leopard frog**

### *Direct & Indirect Effects*

Direct effects of livestock grazing include trampling, degraded water quality, alternation of vegetation and riparian bank structure through foraging and soil compaction, and increased risk of disease transmission (Fleischner 1994, Belsky et al. 1999 and Zwartjes et al. 2005). All unprotected riparian areas would be grazed during the breeding season from March to August during the rotation. Water quality in the unprotected reaches of riparian areas in the Wildbunch Allotment would not have an improvement in water quality. Protected reaches would be affected by livestock grazing in upstream unprotected reaches

Indirect effects of implementing the proposed management plan would include a small increase in water quality in the Blue River and San Francisco River through an improvement in upland soil conditions. With maximum allowable use levels in critical riparian areas to dictate pasture moves, effects to riparian vegetation would be limited. There are periods of nonuse in the main pastures of the Wildbunch Allotment from 7 to 24 months. These actions would help promote more residual riparian herbaceous and shrub cover.

### *Cumulative Effects*

Cumulative effects for this species includes grazing on other allotments, prescribed fire or wildfire, groundwater pumping, recreation, and other activities that may contribute to increased sedimentation that alters water quality and habitat. Cumulatively, these actions can indirectly affect this species through alterations to habitat; including elevating stream substrate embeddedness, decreasing streambank stability, increasing water temperature, and degraded streamside riparian condition. Activities for native fish restoration, including non-native removal, in the Blue River would benefit the species. Both the San Francisco and Blue Rivers contain a number of predaceous nonnative species; including crayfish, channel and flathead catfish, carp, and bullfrogs. Chytrid fungus may be present in some water bodies in the three primary watersheds discussed above. It can be spread between water bodies by humans, livestock, and native terrestrial wildlife.

### *Determination of Effects*

Under the Proposed Action, acceptable water quality condition would not be degraded in the Blue or San Francisco Rivers and primary riparian areas would be excluded from livestock, so the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing.**

## Effects on the Desert sucker and Sonora sucker

### *Direct & Indirect Effects*

Surveys from 1994 to 2005 indicate that Sonora sucker and Desert sucker are consistently found in major numbers. Direct effects from the Proposed Action would be minimal, because livestock are excluded from the Blue River and San Francisco River, other than brief impacts to the Blue River from moving livestock at Juan Miler Crossing twice annually. Timing for livestock movement is limited, occurs in the spring and fall, and takes between 2 and 4 days to complete. Effects are minimized by using FS road 475 to cross the Blue River and by moving the livestock primarily by trailer. A trailer would not be used only if the Blue River is too high to drive across. Spawning conditions would not be ideal during high flows, which would limit direct effects of trailing.

### *Cumulative Effects*

Cumulative effects for these species include all effects from State, tribal, local, and private actions, not involving a federal action, and extend beyond the immediate action area. Water quality and food base for these species have already been impacted because of increased sediment from recent wildfires and other actions including grazing on upstream allotments. With the conservation utilization levels and exclusion of livestock from most riparian areas, effects of the proposed action would be insignificant.

### *Determination of Effects*

Based on the above analysis, the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing.**

## Effects on the Roundtail chub

### *Direct and indirect effects*

Direct effects from trampling streambanks and spawning habitat would be minimal, due to exclusion of livestock grazing from occupied habitat in the both the Blue River and San Francisco River. Direct effects may occur during movement of livestock. Timing for livestock movement occurs in the spring and fall, and takes between 2 and 4 days to complete. Livestock are moved across the Blue River using Forest Service Road 475. Because of the short duration of these direct effects, the potential for direct effects is considered insignificant and discountable.

Indirect effects to roundtail chub from livestock grazing throughout the Wildbunch Allotment include the creation of elevated sediment levels in non-excluded stream corridors and adjacent uplands. This potential sedimentation would not impact the food base of the roundtail as much as that of other species such as the loach minnow, as roundtail are opportunistic omnivores (Propst, 1999). Sedimentation could alter pool habitat, but is more likely to affect spawning habitat during years without high flows to mobilize and move fine sediment.

Adaptive management is expected to mitigate or lessen these effects in a number of ways. Exclusion from the Blue River and San Francisco River would minimize negative effects to riparian habitat. Exclusion mitigates the chance that trampling of adult fish, fry, or eggs would occur, limiting it to the 4-8 days a year proposed for taking livestock across the Blue River. Proposed management of rest-rotation, utilization standards, and critical areas should reduce livestock effects in a given pasture, allow for adequate herbaceous cover to slow runoff, and minimize sedimentation into the Blue River.

### *Cumulative effects*

Grazing on other allotments, prescribed fire or wildfire, groundwater pumping, water diversion, recreation, and other activities that may contribute to increased sedimentation can indirectly affect this species through alterations to habitat. These include elevating stream substrate embedment, decreasing streambank stability,

increasing water temperature, and degraded streamside riparian condition. These effects may result in disturbance or mortality of individuals. Activities for native fish restoration, including non-native removal in the Blue River would benefit the species.

#### *Determination of effect*

Given that livestock grazing is excluded from primary habitat and proposed developments would not substantially alter water availability, the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing.**

#### **Effects on the Greene milkweed, villous groundcover milkvetch, and Arizona alum root**

Based on similar expected outcomes the effects analyses for these species are summarized together.

#### *Direct & Indirect Effects*

Direct effects to sensitive plants resulting from the Proposed Action could include trampling and grazing from livestock, except in exclosures and where plants are inaccessible to livestock due to geography. Potential indirect effects include heavy flows in canyons that tear out plants or bury them with heavy deposition. An overall improvement in upland soil and watershed condition is expected under the Proposed Action. Increases in vegetative ground cover, root holding, and litter return would occur in nonuse periods and through conservative grazing guidelines.

#### *Cumulative Effects*

Impacts to sensitive plants from State, tribal, local, and private actions that are reasonably certain to occur in the action area would be minimal. These species are not found in the action area and are in limited locations or not documented at all on the entire ASNFs.

#### *Determination of Effects*

There are no known populations of any of these species in the action area, but these species have also not been specifically surveyed for in the Wildbunch Allotment. If any of these species are present in the Wildbunch Allotment, the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing.**

#### **Effects on the caddisflies *Lepidostoma apache*, *Lepidostoma knulli*, and *Lepidostoma granti*; the stonefly *Capnia caryi*, and Ferris' copper butterfly**

Based on similar expected outcomes the effects analyses for these species are summarized together.

#### *Direct & Indirect Effects*

If these species are present in the action area direct effects from grazing would be minimal, because a majority of riparian areas, particularly all of the Blue River and all of the San Francisco River are excluded from grazing.

#### *Cumulative Effects*

These sensitive insect species all have very limited known populations. No known State, tribal, local and private actions are expected to occur that would impact any of these insects.

#### *Determination of Effects*

There are no known populations of any of these species in the action area, but if any of these species are present in the Wildbunch Allotment, the Proposed Action **may adversely impact individuals, but is not likely to result in a loss of viability in the planning area, nor cause a trend to federal listing.**

## Migratory Birds

### Alternative 1

#### *Direct & Indirect Effects & Cumulative Effects*

This alternative would not allow for livestock grazing, thus all direct effects from livestock grazing would cease. This would benefit all neo-tropical migratory birds except the Burrowing Owl, which prefers early seral stages in desert grassland habitat. No fences or water troughs would be added. Existing fences and water developments would be unmaintained and eventually cease functioning.

### Alternative 2

#### *Direct & Indirect Effects & Cumulative Effects*

The Proposed Action would have a direct effect on migratory birds, because of constructed range developments. Additional fences and troughs would add new sources for potential mortality for migratory birds. Golden Eagles, Northern Harriers, Burrowing Owls, and other species have been injured and or killed by three strand barb wire fences. The additional fence would also help better distribute livestock across the Wildbunch Allotment, resulting in improved distribution of livestock, and reducing the effects of grazing on vegetation composition and structure. Ground-nesting birds like Northern Harrier can be negatively affected by reduced ground cover or trampling, and some species, such as Gray Vireo, can be indirectly impacted if parasitized by brown-headed Cowbirds. Altered vegetation can also reduce seed availability and increase shrub encroachment, which can negatively impact Grasshopper Sparrows, while Crissal Thrashers benefit from an associated increase in shrub and brush. Grazing in riparian areas can negatively impact all of the riparian obligate neo-tropical migrants; which require wide, dense stands of riparian vegetation with a broadleaf overstory for nesting and foraging. The Blue River and San Francisco River are excluded from grazing, reducing effects to riparian habitats and riparian vegetation.

### **Determination of Effects**

No major effects would occur to range wide populations of migratory bird species because the Proposed Action would not affect the suitability of migratory bird habitat. No unintentional take would occur from the no grazing alternative. Unintentional take may occur with implementing project related activities under the Proposed Action.

### **Important Bird Areas**

The Blue River is a recognized important bird area under Arizona's IBA program. Given that it would continue to be excluded from livestock grazing under all alternatives, the Proposed Action would not adversely alter the character or habitat that makes the Blue River an important bird area.

## **Socioeconomic Resources**

### Assumptions and Methodologies

Environmental consequences for socioeconomic resources within the project area are documented in terms of direct and indirect effects that occur in the area immediately surrounding the boundary for the Wildbunch Allotment, within the Apache-Sitgreaves National Forests. The entirety of the Wildbunch Allotment is within Greenlee County, Arizona. The county is the best available unit for conducting any economic analysis at a project level and represents the affected environment for this analysis. This socioeconomic analysis will discuss two primary implications of management actions- economics (how actions effect money passing through institutions in and around the project area), and social (how actions effect the way people live in and around the project area).

The direct and indirect effects of the Proposed Action and no grazing alternative are analyzed here at two levels:

- Direct Effects: Impacts on the permittee and on the Federal Treasury (grazing fee receipts)
- Indirect Effects: County-wide impacts, second-order effects resulting from the direct effect.

This analysis is based off of relevant statistics, such as the demographics of the local area, and the major socioeconomic indicators that relate to agriculture and public land in the project area. Using the Economic Profile System Analyst (EPSA) tool developed by Headwaters Economics, a socioeconomic profile was produced for Greenlee County. Major socioeconomic indicators include but are not limited to, number of agriculture jobs, contribution of agriculture to the local economy, and the degree of specialization present in the local economy. The percentage of public land in an area is important to consider as well, as it has a direct relationship with how agricultural production depends on public land managers. Further mechanisms to consider include federal land payments, payments in lieu of taxes, and Forest Service Revenue Sharing.

Another key assumption to disclose in this economic analysis is the fact that the primary non-market recreational values in this area of the Apache-Sitgreaves National Forests, such as hunting and OHV use, are not expected to change in any meaningful sense under either alternative, due to the remote and largely roadless character of the project area. Given that this is a site-specific grazing decision for the Wildbunch Allotment, any economic effects analyzed here are restricted to be specific to this allotment and its contribution in the context of the local economy.

While some values used here appear very precise in measurement, they are based on certain assumptions, thus they serve best as an indicator and general magnitude of change rather than a precise measurement. The effects of the Wildbunch Allotment on two segments of the economy are shown in Table 1. The segments include: (1) economic contributions to the local economy, (2) annual grazing fee receipts to the U.S. Treasury. Economic contribution to the local economy is derived from estimated expenditures for 1997 per animal unit as indicated by a survey of forest grazing permittees. They estimated spending an average of \$117 per animal in the local economy, and this is calculated for the range of 188-311 head (Cosgrove C. R., 1998). This amount is converted to 2018 dollars (\$182) by using the inflation calculator developed by the US Department of Labor – Bureau of Labor Statistics (US Department of Labor, 2018). Grazing fees are paid to the federal government per head-month (HM). Current fees are set at \$1.41 per HM.

### Economic Effects of Alternatives

Table 17 below summarizes two of the projected quantitative effect of the alternatives on economic resources, while an extended qualitative discussion of the alternatives follows.

**Table 17: Summary of Estimated Economic Contributions by Alternative**

Indicators	Alternative 1	Alternative 2
Economic Contribution to the Local Economy	0	\$46,436 - \$73,164
Annual Grazing Fee Receipts (Federal)	0	\$6,225

#### *Alternative 1- No Grazing*

Lifestyle changes of ranch employees in response to loss of income or increased debt could include decreasing spending, investing more time in other operations as means of alternate income opportunities and further diversifying operations to make them less dependent upon public land ranching. It is understood that some individuals may be greatly affected by the authorization of grazing in the Wildbunch Allotment, especially those whose business is either tied directly to the permittee or other aspects of range management. Without a

greater level of quantitative data, the intensity of effects to individuals that would be affected cannot be determined at a quantitative level, but this alternative would likely eliminate the viability of the ranch and the directly associated employment.

The no action alternative would result in the loss of fees to the U.S. Treasury and a portion of annual federal payments to Greenlee County for livestock grazing. This loss, by itself, is not substantial; however, the county would also not benefit from tax receipts from potential range improvements and the revenues that are based on the permittees’ use of federal lands. This alternative would generate no economic contribution to the local economy from a livestock operation, would generate no grazing receipts for the federal treasury. Because ranching is a relatively small percentage of employment in the community, the effects on economics of the no action alternative would not result in a measurable effect on employment in the local communities. However, there would be a reduction in the federal revenue-sharing payments to Greenlee County. The loss of grazing privileges on the allotment would represent a detrimental effect on the permittee’s ability to pursue the lifestyle and profession of their choosing.

*Alternative 2- Proposed Action*

The contribution of up to approximately \$6,225 to the federal treasury would come from grazing receipts associated with the Proposed Action. This would contribute to the federal revenue-sharing payments to Greenlee County.

The implementation of the Proposed Action would help to ensure the economic viability of the ranch associated with the Wildbunch Allotment. Alternative 2 would provide an estimated economic contribution to the local economy from a livestock operation in the range of \$46,436 - \$73,164, based on the assumptions disclosed earlier. No social group would be negatively impacted by Forest Service actions related to the issuance of livestock grazing permits. Participation by permittees and others in the ranching business in the community could be expected to remain the same, with any changes being the result of variables beyond the scope of the Proposed Action.

*Environmental Justice*

Executive order 12892 requires federal agencies to address the effects of their actions on low-income and minority populations by considering equity and fairness in resource decision making. This analysis evaluated some selected quantitative demographic indicators of minority populations and low-income populations of communities for purposes of assessing environmental justice (EJ) concerns in the project area. The following analysis only addresses indicators to determine the presence or absence of minority and/or low-income communities in a study area. Table 18 summarizes key demographic indicators of minority populations and low-income populations.

**Table 18: Population statistics for race and ethnicity, and poverty status for Greenlee and Arizona**

Geographic Area	2016 Total population	Percent of 2018 total population								2016 below poverty level	
		White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some other race	Two or more races	Hispanic or Latino (of any race)	Percent of population for whom poverty status is determined, all ages	Percent of Families in poverty status
Arizona	<b>6,728,577</b>	69.5	4.0	4.0	3.0	0.2	0.1	2.1	30.5	17.7	12.9
Greenlee County	<b>9,224</b>	90.3	1.9	3.8	0.6	0.0	2.4	0.0	46.5	13.4	10.3

Neither of the alternatives would result in disproportionate direct, indirect, or cumulative effects to low income or minority populations. The economic analysis suggests that there would be very limited direct or indirect economic effects to the analysis area for the economic analysis, which is Greenlee County.

## Cultural Resources

### Assumptions and Methodologies

Environmental consequences for cultural resources within the project area are documented in terms of direct, indirect, and cumulative effects that occur within the boundary for the Wildbunch Allotment. This analysis evaluated include continued grazing and the evaluation of some identified proposed range improvements. Other range improvements will be phased through time, requiring additional heritage survey or assessment prior to construction.

Analysis of effects to cultural resources in this report is conducted in accordance with Appendix H of the *First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities* in meeting National Historic Preservation Act (NHPA) Section 106 responsibilities. Analysis of the of the project area, including the proposed improvements, was based on the best available current data from the Apache-Sitgreaves National Forests' Heritage site and survey records, the Apache-Sitgreaves National Forests' Heritage GIS database, and discussions with forest range staff. Records for all sites located within the allotment were also searched for any references to existing livestock disturbance. In addition to the archival and GIS analysis, archaeological fieldwork was conducted.

### Environmental Effects on Cultural Resources

#### *Alternative 1- No Grazing*

Under this alternative, livestock would be removed from the allotment over a two-year period and no construction of additional range improvements will take place. The potential for heritage resources within the allotment to be either directly or indirectly affected by livestock grazing would be eliminated. Because of a lack of grazing, ground cover should increase, minimizing the impacts of erosion on cultural resource sites. Given that no new range improvements would be constructed under this alternative, no ground-disturbing activity with the potential to affect heritage resources will take place.

#### *Alternative 2- Proposed Action*

The Proposed Action would continue livestock grazing on the allotment using an adaptive management framework that will progress toward or maintain desired conditions of the rangeland vegetation (see range section, beginning of chapter 3). While the improvement of vegetative cover and soil conditions would in turn benefit cultural resources, impacts to the resources resulting from the presence livestock can potentially include:

- Livestock trampling sites and artifacts by congregating heavily within site boundaries
- The construction of range improvements that necessitate ground-disturbing activities
- Removal of vegetation and erosion caused by livestock grazing which impacts the movement of surface deposits and alters the setting and geography of sites.

Any improvement in vegetative cover and soil conditions resulting from implementing the Proposed Action would benefit cultural resources by reducing the visibility of sites and the movement of artifacts. When livestock grazing continues under a scenario that moves the land towards desired conditions, an adverse effect would not be expected to occur. Thus, the Proposed Action is considered to have no adverse effect to cultural resources provided that the management recommendations provided in the heritage specialist's report are adhered to.

Any other future range improvement or vegetative treatment projects not identified at this time will be surveyed for cultural resources, if appropriate, and a separate clearance report issued in compliance with the NHPA, the *First Amended U.S.D.A., Forest Service, Region 3 Programmatic Agreement (PA) Regarding Cultural Property Protection and Responsibilities*, dated December 24, 2003, and more specifically within the PA, Appendix H - Standard Consultation Protocol for Rangeland Management, for each of the new undertakings on a project-by-project basis prior to implementation.

#### *Cumulative Effects of the Proposed Action on Cultural Resources*

The results of the Proposed Action, through increased vegetative cover and stable soils, has the potential to combine with other projects like travel management planning to increase vegetative cover. However, there are also many current uses and reasonable foreseeable actions that could decrease vegetative cover and soil stability. Ultimately, the net cumulative impact on cultural resources within the allotment combined with the Proposed Action is negligible.

## Chapter 4: Agencies and Persons Consulted

The following Forest Service employees served on the interdisciplinary team to complete the analysis for this project.

### Interdisciplinary Team Members

Name	Title
Edwin Holloway	District Ranger, Responsible Official
Dave Evans	Rangeland Program Manager
Orry Hatcher	NEPA Coordinator
Shannon Houlette	Wildlife Biologist
Stephanie Coleman	Wildlife Biologist
John Rihs	Hydrologist
Chris Nelson	Hydrologist (past)
Eric Robertson	Soils Scientist
Eric Bredemann	Clifton Archaeologist (past)
Cynthia Englebert	Rangeland Management Specialist
Eric Bredemann	Geographic Information Systems Coordinator (past)

The Forest Service consulted the following individuals, federal, state and local agencies, tribes and non-Forest Service persons during the development of this environmental assessment:

### Federal and State Officials and Agencies

US Fish and Wildlife Service  
US Senate – Office of Jon Kyl  
US Senate – Office of John McCain  
Arizona House of Representatives - Office of Paul Newman (past)  
Arizona House of Representatives – Office of Ruben Ortega (past)  
Arizona Department of Environmental Quality  
Arizona Game and Fish Department  
Arizona State Historical Preservation Office  
Greenlee County  
City of Duncan  
University of Arizona Cooperative Extension

### Tribes

White Mountain Apache Tribe Ft. McDowell Yavapai Indian Nation  
San Carlos Apache Tribe  
Hopi Tribe  
Tonto Apache Tribe  
Navajo Nation  
Yavapai-Apache Nation  
Pueblo of Zuni  
Yavapai-Prescott Tribe

### Others

Scoping lists available upon request.

# Draft Finding of No Significant Impact

The following is a summary of the project analysis to determine significance, as defined by Forest Service Handbook 1909.15-05. “Significant” as used in NEPA requires consideration of both context and intensity of the expected project effects that result from our interdisciplinary analysis summarized above and available in full detail in the project record.

## Context

For site-specific actions, like the Proposed Action detailed in this final EA, significance usually depends upon the effects in the local rather than in the world as a whole. This project is limited in scope and duration. This project is a site-specific action that does not have international, national, region-wide or statewide importance environmentally. The intended decision is made within the context of local importance in the area associated with the Apache-Sitgreaves National Forests and the Clifton Ranger District..

There are 92 active allotments on the Forests, 22 of which are located on the Clifton Ranger District. The district consists of approximately 550,000 acres, with livestock grazing currently authorized across 20 of the 22 allotments on the district, including the Wildbunch Allotment. Approximately 404,000 acres of the Clifton Ranger District are occupied by active grazing allotments (minus some unused individual pastures and riparian enclosures), totaling around 73 percent of the District.

In terms of scale and scope of grazing authorization for the Wildbunch Allotment, this allotment contains 23,027 acres of National Forest System land. All of these acres could potentially be grazed under the Proposed Action with the exception of excluded areas totaling approximately 1,226 acres that would decrease the area affected to 21,801 acres. The acres proposed for grazing here represent approximately four percent of the acreage in the entire Clifton Ranger District, and just over one percent of the total land area of the Apache-Sitgreaves National Forests.

## Intensity

Intensity is a measure of the severity, extent, or quantity of effects, and is based on information from the effects analysis, found summarized in chapter 3 of this final EA, and the references in the project record. The effects of authorizing grazing within the Wildbunch Allotment have been appropriately and thoroughly considered with an analysis that is responsive to concerns and issues raised by the public. The agency has taken a hard look at the environmental effects using relevant scientific information and knowledge of site-specific conditions gained from field visits. This finding of no significant impact is based on the context of the project and intensity of effects using the ten factors identified in 40 CFR 1508.27(b). If these factors exist, there is not necessarily a significant impact; rather, the responsible official must evaluate these factors in light of context and intensity to determine if there are significant impacts.

**1) Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on the balance the effects will be beneficial.** Under the Proposed Action, range improvements would be added which would improve distribution of livestock. With the increased livestock distribution, the Proposed Action would maintain or improve upland vegetation. Flexibility given to resource managers to adjust the timing, intensity, frequency, and duration of livestock grazing will ensure that plants are not used beyond levels that will provide for recovery, improved vigor, and recruitment of desirable species. Light to conservative use levels, in addition to mitigation measures such as not placing salt and/or mineral supplements within stream or riparian corridors will minimize effects to riparian areas and stream channels will be minimal. In addition, vegetation on the allotment will likely increase in desirable forage plant densities and litter. Authorization of incidental use may result in some localized impacts through disturbance from livestock grazing. No significant adverse effects were identified during the analysis (see EA Chapter 3, Environmental Consequences).

**2) The degree to which the Proposed Action affects public health or safety.** We conclude that there will be no significant effects on public health and safety because rangeland management activities similar to those described in the EA have occurred in this area, as well as over most of the Apache-Sitgreaves National Forests, without issues related to public health and safety. It is worth noting here that as part of Chapter 3, water quality was considered as part of the hydrology, riparian, and watershed analysis, and discussed E. coli impairment to the Blue River including reaches that border the allotment. However, given the closure of the Blue River pasture to livestock and strict adherence to management practices and mitigation measures in the proposed action, such as salting/supplement locations up out of the drainages, the proposed action is not expected to contribute to the extant E. coli impairment, nor cause any additional impairments. The proposed action will not impact this impairment based on current assessment data, which was inconclusive as to the source of the impairment.

**3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.** There will be no significant effects on unique characteristics of the area. A portion of the Lower San Francisco Inventoried Roadless Area overlaps with the allotment, however, the proposed action does not include any changes to existing transportation nor does it authorize the construction of new roads. There are no Wilderness or Recommended Wilderness areas within the Wildbunch Allotment. There are no eligible or designated Wild and Scenic River reaches within the grazed area. The reach of the Blue River that runs through the excluded area of the allotment is listed as a suitable stretch of river eligible for “wild” designation, but it is not grazed and has not been since approximately 1994. As discussed in chapter 3 of the final EA, the allotment is known to contain cultural resources of both prehistoric and historic periods. The proposal to continue livestock management is considered to have a no adverse effect on the heritage properties located within the Wildbunch Allotment since the construction of new range developments will be designed to avoid impacts to cultural resources, and relevant tribes have been consulted with throughout the project-level planning process.

**4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.** The effects on the quality of the human environment are not likely to be highly controversial. There is no known credible scientific controversy over the impacts of the Proposed Action. This environmental analysis is tiered to the Environmental Impact Statement (EIS) for the Apache-Sitgreaves National Forests Land Management Plan, and the suitability of this project area for grazing was determined in that EIS (see also figure 3, chapter 1 of EA). Management actions such as those discussed in Chapter 2 for the Proposed Action are implemented in other areas throughout the Apache-Sitgreaves National Forests and on many other national forests in both the Southwestern Region and across the larger United States. Furthermore, the effects of the Proposed Action and alternatives have been analyzed in line with *40 CFR 40 1500.1* and *36 CFR 220.7* in Chapter 3. While some members of the public are opposed to livestock grazing on public lands and others view the Forest Service as too restrictive in its management, this action and its potential impacts does not represent anything highly controversial within the larger context of the *National Environmental Policy Act*. The analysis in this final EA represents the judgement and expertise of resource management professionals who have applied their knowledge to similar projects and resources in the past. There has been no information presented that would demonstrate that the action would cause adverse impacts that could not be mitigated. Accordingly, we conclude that it is unlikely that the environmental effects associated with the action will be highly controversial. The intensity of grazing and management practices proposed are consistent with the best scientific information currently available and current Forest Service direction.

**5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.** The staff of the Apache-Sitgreaves National Forests and the interdisciplinary team that conducted the analysis have considerable experience with actions that are highly similar to the

Proposed Action. Further, our analysis shows the effects of implementing the Proposed Action are not uncertain, and do not involve any unique or unknown risk. This action is similar to many past actions, both in this analysis area and the larger Apache-Sitgreaves National Forests. It is highly likely that the effects of implementing this Proposed Action will be similar to the effects of past, similar actions. The interdisciplinary team that conducted the analysis used scientifically accepted analytical techniques and the best available information to estimate potential effects associated with the proposal, including agency scientific guidance specific to rangeland management (See various subsections within EA Chapter 3).

**6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.** The action is not likely to establish a precedent for future actions with significant effects because it is a stand-alone decision and each grazing allotment is evaluated independently on its own merits. Major follow-up actions will not be necessary. We conclude that this action does not establish precedent for future actions, which will be evaluated through an environmental analyses process on a project-by-project basis, in compliance with *40 CFR 1500-1508* and *36 CFR 220*.

**7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.** The cumulative impacts have been displayed in this analysis in both the EA and in specialist reports contained in the project record. Chapter 3 of the EA discusses the combined effects of the project with other past, current and reasonably foreseeable future actions across a wide variety of resource areas. Based on the discussions in the EA, specialist reports, and information identified during public review, we have concluded that there are no significant cumulative impacts.

**8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in the National Register of Historic Places or may cause loss or destruction of significant cultural or historical resources.** The action will have no significant adverse effect on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. Areas proposed for ground-disturbing activities will be surveyed and all cultural resources or historic sites will be avoided. The adaptive management option alternatives for the Wildbunch Allotment include new fence construction, existing fence maintenance and repair and water distribution and collection developments. These activities may be considered undertakings, depending upon the nature of the fence installation/removal activities. According to the Programmatic Agreement between the Forest Service and the State Historic Preservation Officer, maintenance, replacement, or reconstruction of existing facilities are not considered undertakings and do not require additional survey. However, to ensure that the requirements of Section 106 of the National Historic Preservation Act are met, any new range improvement projects that will result in ground-disturbing activity associated with the proposed improvements will require case-by-case consultation and clearance from the Apache-Sitgreaves NF Heritage Program Manager. All areas affected by the improvements will be surveyed prior to project implementation to make certain that there are no adverse effects upon heritage resources. In the event that cultural resources are discovered, project concurrence by the Arizona State Historic Preservation Officer will be sought prior to project implementation.

Inventories shall be conducted in accordance with the stipulations set forth in the *First Amended Programmatic Agreement*. Archeological clearance must be approved with all necessary consultation with SHPO prior to the construction, modification, or removal of all improvements. This approach, based on long-term consultation with SHPO and on U.S. Forest Service Region 3 policy as embodied in the *First Amended Programmatic Agreement Regarding Historic Property Protection and Responsibilities*, and specifically, Appendix H, the *Standard Consultation Protocol for Rangeland Management* developed pursuant to Stipulation IV.A of the *Programmatic Agreement* is considered to be the "standard operating procedure" for treating potential grazing impacts to heritage resources on the Southwestern National Forests, including the Apache-Sitgreaves. By following these guidelines, the project will be in compliance with Section 106 of the National Historic Preservation Act, as amended, and Section 101(b)(4) of the National Environmental Policy

Act of 1969. The most recent listings of the National Register of Historic Places have been consulted, and no sites that appear on the Register occur within the project area. Finally, the Proposed Action has a determination of “No Adverse Effect” on cultural resources located within the Wildbunch Allotment.

**9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act.** There are federally-listed threatened or endangered species or their habitat within the project area. The Wildlife, Fisheries, and Rare Plants Report serves as the Biological Evaluation for the Wildbunch Allotment and documents the effects on species and habitat, as summarized in chapter 3 of the final EA. A biological assessment (BA) analyzed the effects of the Proposed Action on seven federally-listed species and their designated or proposed critical habitat, and was submitted to the US Fish and Wildlife Service, which concurred with our assessment and determinations.

On July 21, 2015, the letter from the Clifton Ranger District was received in the USFWS Ecological Services office on that date requesting initiation of formal section 7 consultation under the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 et seq.) for ongoing livestock grazing and effects to seven listed species and proposed and designated critical habitat under the Wildbunch Allotment Management Plan (AMP) on the Clifton Ranger District, Apache-Sitgreaves National Forests (ASNFs), Arizona. A Final Biological Opinion (02EAAZ00-2015-F-0849) was issued on February 2, 2017.

The consultation process with the USFWS and resulting Biological Opinion on threatened or endangered species on the Wildbunch Allotment indicated that the Proposed Action was neither likely to have an adverse effect on Yellow-billed cuckoo, the Southwestern Willow Flycatcher, the Mexican Spotted Owl, or narrow-headed gartersnake nor an adverse effect on their critical habitat, representing 4 of the 7 threatened or endangered species with habitat or range overlapping with the allotment. However, for the Chiricahua leopard frog, loach minnow, and spikedace, USFWS found the action likely to adversely affect the species. This determination for the Chiricahua leopard frog was based on the presence of *occupiable* riparian habitat on the WBA, as opposed to the existence of the species on the allotment at present. Surveys have not found the Chiricahua leopard frog on the allotment. Such a determination for the loach minnow and spikedace is based primarily on upland sediment disturbance within the allotment potentially impacting downstream habitat for these aquatic species, though the habitat itself is excluded from direct impacts. Loach minnow and spikedace are present within the allotment, although not within a grazed area due to the Blue River pasture being excluded from livestock grazing through topography and strategically placed fencing.

With respect to these three species, it is important to emphasize the USFWS further concluded that the Proposed Action is not likely to jeopardize the continued existence of these three species or destroy or adversely modify their critical habitat(s).

**10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.** The action will not violate Federal, State, and local laws or requirements for the protection of the environment. This project is consistent with the Apache-Sitgreaves National Forests Land Management Plan and the National Forest Management Act (NFMA), Clean Water Act, and the Federal Land Policy Management Act of 1976.

## Conclusion

After considering the environmental effects described in the EA and specialist reports, we have determined that the Proposed Action, alternative 2, will not have significant effects on the quality of the human environment considering the context and intensity of impacts (40 CFR 1508.27). Thus, an environmental impact statement will not be prepared.

## References

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## Appendix A: Glossary of Terms:

(Adapted from the Society for Range Management's *Glossary of terms used in range management* as well as regulations found in Forest Service Handbook 2209.13 – *Rangeland Management Decision-making* and Forest Service Handbook 1909.15- *National Environmental Policy Act Handbook*)

**Adaptive Management-** A formal, systematic, and rigorous approach to learning from the outcomes of management actions, accommodating change, and improving management. It involves synthesizing existing knowledge, exploring alternative actions and making explicit forecasts about their outcomes.

**Allotment Management Plan (AMP)** - An Allotment Management Plan (AMP) is unique, and is based on the individual landscape and ranch operation and will be modified with modification or issuance of a new permit following a NEPA decision to ensure consistency with the NEPA decision.

**Animal Month (AM)** - A month's use and occupancy of rangeland by a single animal or equivalent.

**Animal Unit Month (AUM)** – The quantity of forage required by one mature cow (1,000 pounds) or the equivalent for 1 month; approximately 26 lbs. of dry forage per day is required by one mature cow or equivalent.

**Annual Operating Instructions (AOI)** - Instructions developed a guideline for grazing management by the agency and livestock permittee for implementing grazing management activities on a specific allotment for a specific grazing season.

**Aquatic** – Pertaining to standing and running water in streams, rivers, lakes and reservoirs.

**Browse** – Young twigs and leaves of woody plants consumed by wild and domestic animals.

**Candidate Species-** Plants and animals for which the U.S. Fish and Wildlife Service (FWS) has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act

(ESA), but for which development of a proposed listing regulation is precluded by other higher priority listing activities.

**Community Type** – Community types represent existing vegetation communities that do not currently reflect potential due either to disturbance or natural processes related the development of the community. Vegetation may be disturbed by a number of factors including: grazing, fire, and other activities.

**Critical Habitat** – That portion of a wild animal's habitat that is critical for the continued survival of the species as declared by the Secretary of the Interior.

**Cultural Resource** – The physical remains of past human cultural systems and places or sites of importance in human history or prehistory.

**Desired Conditions-** Descriptions of the social, economic and ecological attributes that characterize or exemplify the desired outcome of land management. They are aspirational and likely to vary both in time and space.

**Dispersed Recreation** – In contrast to developed recreation sites picnic grounds, dispersed recreation areas are the lands and waters under Forest Service jurisdiction that are not developed for intensive recreation use.

**Ecological Type** – Ecological types are derived directly from the TES document and describe the potential vegetation for a particular soil type. The potential vegetation was defined through intensive field sampling. See the Terrestrial Ecosystem Survey Handbook, USDA 1986 for a full description of how potential vegetation descriptions were derived.

**Endangered Species** – Any species that is in danger of extinction throughout all or a significant portion of its range, as declared by the Secretary of the Interior.

**Environmental Analysis** – An analysis of alternative actions and their predictable short- and long-term environmental effects, including physical, biological, economic and social effects.

**Environmental Assessment** – The concise public document required by regulations for implementing the procedural requirements of NEPA (40 CFR 1508.9).

**Forage** – All non-woody plants (grass, grass-like plants and forbs) and portions of woody plants (browse) available to domestic livestock and wildlife for food.

**Forage Utilization** – The portion of forage production by weight that is consumed or destroyed by grazing animals. Forage utilization is expressed as a percent of current year's growth.

**Forest Plan** – A document, required by Congress and the National Forest Management Act, assessing social and environmental impacts of land management activities, and describing how land and resources will provide for multiple use and sustained yield of goods and services.

**Grazing Capacity** – The maximum level of plant utilization by grazing and browsing animals that will allow plants or associations of plants to meet their physiological and/or reproductive needs.

**Grazing Period** - The length of time grazing livestock or wildlife occupy a specific land area.

**Grazing Permittee** – An individual who has been granted written permission to graze livestock for a specific period on a range allotment.

**Ephemeral** – A stream that flows only in direct response to precipitation, and whose channel is above the water table at all times.

**Erosion** – The wearing away of the land's surface by running water, wind, ice or other geological agents. Erosion includes detachment and movement of soil or rock fragments by water, wind, ice or gravity.

**Gully Erosion** – The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to depths ranging from several feet to as much as 75 to 90 feet.

**Habitat** – The sum total of environmental conditions of a specific place occupied by a wildlife species or a population of such species.

**Impaired Soil Condition** – Indicators signify a reduction in soil function. The ability of the soil to function properly and normally has been reduced and/or there exists an increased vulnerability to degradation. Changes in land management practices or other preventative measures may be appropriate.

**Improvement** – Manmade developments such as roads, trails, fences, stock tanks, pipelines, power and telephone lines, survey monuments and ditches.

**Incidental Use** - Incidental Use targets the lower range of the Light Use (0-30%) category in all seasons by applying such practices as herding or by limiting where livestock attractants such as salt or water are placed relative to the area of concern.

**Indicator Species** – A wildlife species whose presence in a certain location or situation at a given population level indicates a particular environmental condition. Population changes are believed to indicate effects of management activities on a number of other wildlife species.

**Instream Flows** – Those necessary to meet seasonal streamflow requirements for maintaining aquatic ecosystems, visual quality and recreational opportunities on National Forest lands at acceptable levels.

**Interdisciplinary (ID) Team**– A group of individuals with skills from different resources. An interdisciplinary team is assembled because no single scientific discipline is sufficient to adequately identify and resolve issues and problems. Team member interaction provides necessary insight to all stages of the environmental analysis process.

**Intermittent (or Seasonal Stream)** – A stream that flows only at certain times of the year when it receives water from springs or from some surface source such as melting snow in mountainous areas.

**Issue** – a point of discussion, debate, or dispute with a Proposed Action based on some anticipated effect.

**Key Area** - A relatively small portion of a range selected because of its location, use or grazing value as a monitoring point for grazing use.

**Management Indicator Species** – See “Indicator Species.”

**Mesa** – A tableland; a flat-topped mountain or other elevation bounded on at least one side by a steep cliff.

**Monitoring** - The orderly collection, analysis, and interpretation of resource data to evaluate progress toward meeting management objectives. This process must be conducted over time in order to determine whether or not management objectives are being met.

**National Environmental Policy Act (NEPA)** – An act to declare a National policy that will encourage productive and enjoyable harmony between man and his environment; to promote efforts that will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the Nation and to establish a Council on Environmental Quality.

**National Forest System Land** – National forests, national grasslands and other related lands for which the Forest Service is assigned administrative responsibility.

**NEPA**- See “National Environmental Policy Act”

**Perennial Stream** – A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

**Permitted Grazing** – Authorized use of a National Forest range allotment under the terms of a grazing permit.

**Proper Functioning Condition (PFC)** - A methodology for assessing the physical functioning of riparian and wetland areas. The term PFC is used to describe both the assessment process, and a defined, on-the-ground condition of a riparian-wetland area.

**Proper Functioning Condition (PFC) Assessment** - Provides a consistent approach for assessing the physical functioning of riparian-wetland areas through consideration of hydrology, vegetation, and soil/landform attributes. The PFC assessment synthesizes information that is foundational to determining the overall health of a riparian-wetland area.

**Proposed Action** – In terms of the National Environmental Policy Act, the project, an activity or action that a Federal agency intends to implement or undertake and that is the subject of an environmental assessment.

**Range Allotment** – A designated area of land available for livestock grazing upon which a specified number and kind of livestock may be grazed under a range allotment management plan. It is the basic land unit used to facilitate management of the range resource on National Forest System and associated lands administered by the Forest Service.

**Range Condition** – The state of health of a range land site based on plant species composition and forage production in relation to the potential under existing site conditions. Range condition is rated as satisfactory or unsatisfactory.

**Riparian** – Land adjacent to perennial and intermittent streams, lakes and reservoirs. This land is specifically delineated by the transition

ecosystem and defined by soil characteristics and distinctive vegetation communities that require free and unbound water.

**Satisfactory Soil Condition** – Indicators signify that soil function is being sustained and soil is functioning properly and normally. The ability of the soil to maintain resource values and sustain outputs is high.

**Sheet Erosion** – The removal of a fairly uniform layer of soil from the land surface by rainfall and runoff water without the development of conspicuous water channels.

**Soil Erosion** – The wearing away of the land surface by running water, wind, ice or other geological agents, including such processes as gravitational creep. Detachment and movement of soil or rock by water, wind, ice or gravity.

**Soil Productivity** – The capacity of a soil in its normal environment to produce a specified plant or sequence of plants under a specified system of management.

**Species Composition** – Species composition refers to a descriptive list of species that together make up a given ecological community.

**Species Diversity** – Diversity refers to the measure of composition for a given community and is also referred to as species richness.

**Stream Reach** - the length of the stream selected for monitoring.

**Structural Range Improvement** – Any type of range improvement that is manmade (e.g., fences, corrals, water developments).

**Suitable Range** – Range which is accessible to livestock or wildlife and which can be grazed on a sustained yield basis without damage to other resources.

**Terrestrial Ecosystem Survey (TES)** - consists of the systematic analysis, classification and mapping of terrestrial ecosystems. It describes and maps the soils and potential vegetation (ecologi-

cal types). This Ecological Classification describes the existing vegetation associated with the ecological map units.

**Threatened Species** – Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

**Travelway** - Any transportation facility that allows vehicle passage of any sort, that came into existence without plans, design or standard construction methods, that is not maintained or signed and has a very low traffic volume.

**Trend**- The direction of change in an attribute as observed over time.

**Unsatisfactory Soil Condition** – Indicators signify that a loss of soil function has occurred. Degradation of vital soil functions result in the inability of the soil to maintain resource values, sustain outputs or recover from impacts. Unsatisfactory soils are candidates for improved management practices or restoration designed to recover soil functions.

**Utilization**- The proportion or degree of the current year's forage production that is consumed or destroyed by animals (including insects). The term may refer either to a single plant species, a group of species, or to the vegetation community as a whole.

**Watershed** – The entire area that contributes water to a drainage or stream.

**Watershed Condition** – A description of the health of a watershed in terms of the factors that affect the hydrologic function and soil productivity.

**Wildlife Habitat** – The sum total of environmental conditions of a specific place occupied by a wildlife species or a population of such species.

# Appendix B: Wildbunch Allotment Monitoring Plan

## Introduction

The objective of this monitoring plan is to identify monitoring methodology and frequency to determine whether management is being properly implemented and whether the actions are effective at achieving or moving toward desired conditions. Monitoring is a measure of indicators that detect change and may trigger further detailed analysis of a particular resource.

Adaptive management provides a menu of management options that may be needed to adjust management decisions and actions to meet desired conditions as determined through monitoring. A critical component of adaptive management is monitoring.

### *Monitoring Definitions*

**Monitoring** is defined as the orderly collection, analysis and interpretation of resource data to evaluate progress toward meeting management goals and objectives. This process must be conducted over time in order to determine whether or not management objectives are being met.

**Implementation Monitoring** determines whether standards and management practices are implemented as detailed in the allotment management plan (AMP) or the annual operating instructions (AOI). This short-term monitoring answers the question: “Was the management implemented as designed?” It annually documents several items including answering questions such as: (1) were management actions implemented as designed and (2) did the management actions achieve the annual effect expected. Items which may be documented through implementation monitoring include, but are not limited to, actual use (livestock numbers and days), condition of range improvements, etc.

**Effectiveness Monitoring** determines whether management practices are effective in moving the allotment toward a desired condition as described in the AMP. This long-term monitoring documents whether management actions are having the expected progress towards achieving resource management objectives. Effectiveness monitoring considers: (1) whether management practices met resource objectives or corrected problems, (2) utilization measurements, and (3) progress made towards specific properly functioning condition (PFC) elements.

## Monitoring Summary

Tables 19 summarize the monitoring to be accomplished on the allotment. See map of pasture conditions and key areas proposed monitoring points at the end of the plan section.

**Table 19: Specific Monitoring Items (Who, What, When and Where)**

Monitoring Item:	Methods	Timing (mid-season)	Frequency (Interval, years)	Where	Critical Triggers	Lead
Upland Implementation monitoring	Various methods*	Utilization measured in the Fall, Grazing intensity when cattle leave a pasture	Utilization-annually, Intensity up to several times a year	by pastures and in Key areas	Monitoring results would identify triggers	Range
Ecological status/range condition (Trend, composition, ground cover)	Various methods*	Late summer	Year 5 and 10	Permanent transects	Poor or very poor range; Downward or non-apparent trends	Range
Assess riparian condition/key PFC elements using MIM protocols	Utilization/Stubble Height Woody species Use Streambank Alteration Greenline Composition	Mid-summer or later	Annual Annual Semi-Annual Every 5 years	Key areas associated with permanent transects. Riparian critical areas TBD (Cienega, Mud Springs and Wild Bunch Canyons and Oak or Indian Creek)	Downward or non-apparent trends	Range/Watershed/Wildlife
Soil condition	Various methods*	Any	As needed Onset, year 5 and 10	Critical and Key areas and associated with Permanent Transects	Exceedance of percent utilization guidelines	Range/Watershed/Wildlife

\*Available from Interagency Technical, 1996, Southwestern Region Rangeland Analysis and Management Training Guide, Principles of Obtaining and Interpreting Utilization Data on Rangeland, 5/07, and other acceptable methods.

\*\* Burton, T.A., S.J. Smith and E.R. Cowley. 2011. Riparian area management: Multiple indicator monitoring (MIM) of stream channels and streamside vegetation. Technical Reference 1737-23, BLM/OC/003+1737. U.S. department of the interior, Bureau of land Management, National Operations center, Denver, CO. 155pp.

## Range Management

### Implementation Monitoring:

**Objective:** ensure that the action(s) described in the decision document are implemented accordingly as scheduled and are in compliance with the forest plan standards and guidelines.

**Permit Compliance:** Throughout each grazing season, Forest Service personnel will monitor activities on the allotment to ensure compliance with Permit terms and conditions, the Allotment Management Plan (AMP), and the Annual Operating Instructions (AOI).

**Livestock Actual Use:** Permittee will keep accurate records regarding actual livestock numbers and pasture use dates on the form supplied as part of the AOI. This form will be submitted to the Forest Service at the end of the grazing season.

**Grazing Intensity & Utilization:** Grazing intensity would be managed to allow for the physiological needs of plants. On the Wildbunch Allotment, grazing intensity would be managed at conservative levels (31-40%) during the dormant season when sufficient opportunity exists for plant regrowth. During spring and summer growing periods, grazing intensity would be managed at light levels (0-30%) when the potential for plant regrowth is limited. Conservative grazing intensity (35% leaders browsed) would be managed on key upland woody species in the dormant season. Grazing intensity of 25 to 35% use on key woody species within riparian areas based on riparian condition would occur.

Grazing intensity measurements will be taken in key areas which reflect grazing effects within an entire pasture. A minimum of one key area<sup>1</sup> will be established within each main grazing pasture, at existing long-term monitoring sites if possible, to represent the overall grazing intensity within the pasture.

Utilization is defined as the proportion or degree of current year's forage production that is consumed or destroyed by animals (including insects)<sup>2</sup> (see map at the end of section). It is a comparison of the amount of herbage left compared with the amount of herbage produced during the year. Utilization is measured at the end of the growing season when the total annual production can be accounted for and the effects of grazing in the whole management unit can be assessed. Critical areas are to be identified within a pasture and monitored accordingly.

Utilization guidelines are not intended as inflexible limits. Utilization measurements can indicate the need for management changes prior to this need being identified through long term monitoring. Utilization data would not be used alone, but would be used along with climate and condition/trend data, to determine stocking levels and pasture rotations for future years.

Residual measurements – to assure that adequate standing grasses are left post livestock grazing for hiding cover. Height of grasses will be collected at the end of the growing season.

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<sup>1</sup> 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.

<sup>2</sup> Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands. 2005. U of A Cooperative Extension Service

If monitoring shows that the utilization guideline was exceeded in a pasture, the grazing schedule and/or livestock numbers would be adjusted for the following year. If utilization is exceeded for two consecutive years or in any two out of five years, then changes would be made to the grazing management system.

General Observation – Current resource conditions (forage growth and livestock water) and other impacts of land use actions will be assessed when necessary (particularly during drought conditions) prior to livestock entry.

**Noxious Weeds** - The location of any noxious weeds should be noted in the utilization-monitoring write up. During this monitoring any noxious weeds shall be grubbed out or treated and documented regarding the location. Noxious weeds can be tracked from the same data used to collect plant composition and density.

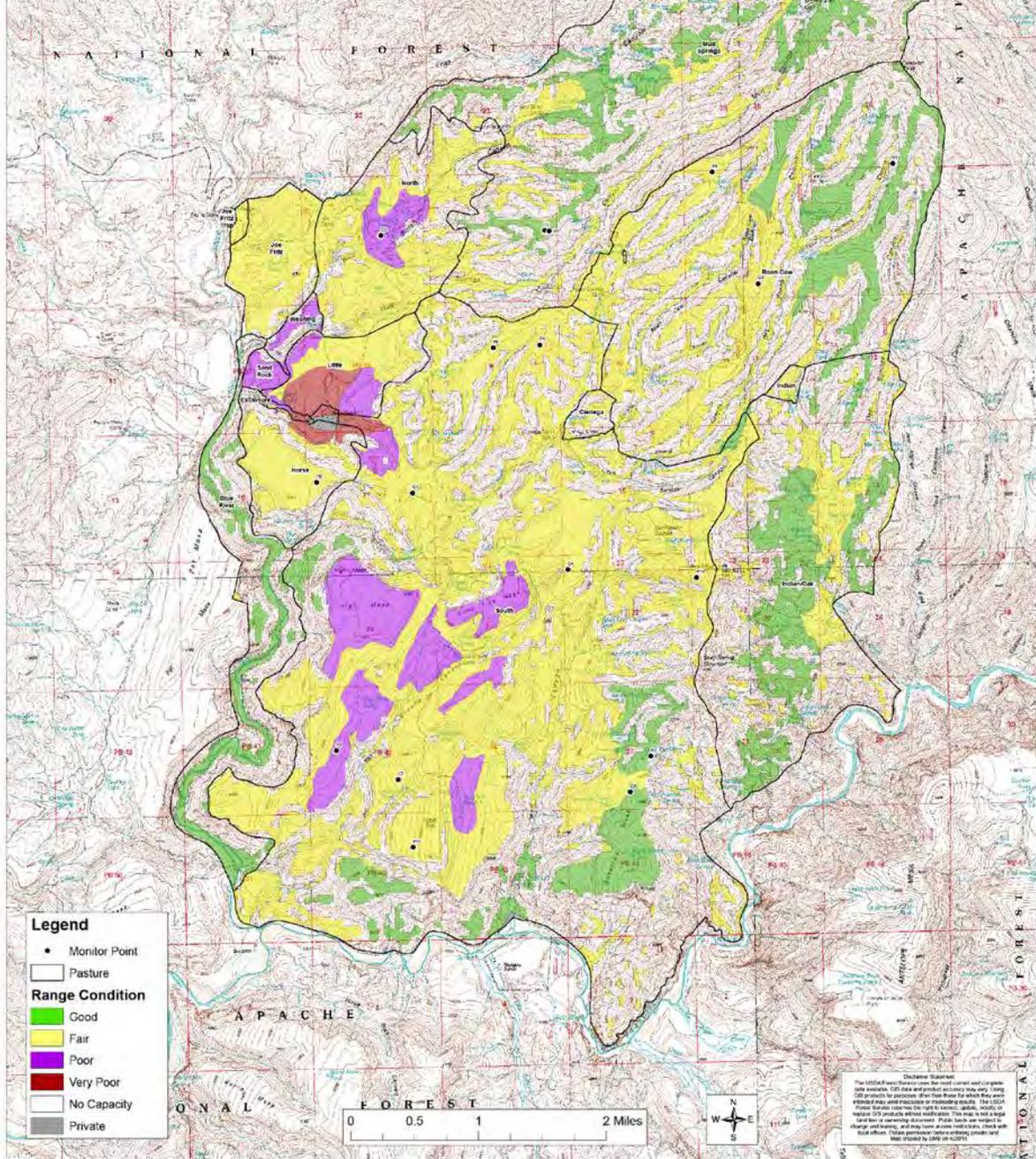
A written summary will be completed each year by Forest Service personnel to document the overall history of that year's grazing. This document will include a monitoring summary, livestock actual use, weather history, and a discussion of the year's accomplishments and problems. Information from this report will be used in preparing the following year's AOI.

## Effectiveness Monitoring

**Objective:** Effectiveness monitoring is intended to determine whether management is successful at moving rangeland resources towards desired conditions. Effectiveness monitoring will occur within key areas on permanent transects at an interval of 10 years or less. Effectiveness monitoring may also be conducted if data and observations from implementation monitoring (annual monitoring) indicate a need. The long-term health of upland and riparian resources will be monitored in key areas or critical areas on each allotment using one or more of the following methods as needed, but not limited to:

1. Ecological status and/or range condition trend – range clusters and areas suitable for determining long-term trend in vegetation should be read at 10th year. Emphasis on monitoring ecological status will be made. The trend in the west portion of the south pasture will be a focus in order to determine if management practices are moving the pasture toward the desired conditions.
  - a. Ecological status (cover frequency/similarity)
  - b. Ecological status (Parker 3-Step was used to establish baseline, but ecological status will be used in the future)
2. Cover – the percent of an area that is covered by vegetation, rocks and litter. Ground cover is important to intercept raindrops impact before reaching the soil. An increase in vegetation and litter cover from baseline measures is considered as moving toward desired conditions (DC), a decrease is considered as not accomplishing DC.
  - a. Point cover
  - b. Cover frequency
  - c. Paced transect

Monitoring will be used to adjust or amend previously described actions in the decision document or AMP. Information on monitoring should be shared with the permittee and others concerned with the decision. If the monitoring data is not achieving or moving toward the desired conditions, Forest Service personnel must analyze the problem and decide on a course of action. If necessary, an ID team may be convened to determine if the goals and objectives are correct or need to be adjusted. Re-initiation of NEPA may not be necessary if the action is still within the scope of the original decision.



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# Appendix C: Best Management Practices

## Cultural Resources

- Any new range improvements projects that result in ground disturbing activity will require case-by-case consultation and clearance from the Apache-Sitgreaves NFs Heritage Program Manager. This applies to all the adaptive management proposals.
- In the event a historic or pre-historic cultural resource is found during implementation, all activities would cease and appropriate officials and affiliated tribes would be notified to evaluate the situation. Project activities may resume after proper notifications, mitigations and archaeological clearances are obtained.

## Soil and Watershed Resources

- Planned grazing systems shall be implemented to maintain or improve plant cover for the purpose of maintaining existing plant cover while properly using the forage available, increasing efficiency by uniformly using all suitable parts of each grazing unit, reducing erosion and improve water quality, insuring a supply of forage throughout the grazing season, increasing production with improved quality of forage, enhancing wildlife habitat, promoting flexibility in the grazing program and buffer the adverse effects of drought.
- Grazing shall be at an intensity that would maintain enough cover to protect the soil or improve the quantity and quality of desirable vegetation. Allowable use would be adjusted by range condition class on fully and potentially capable land. Key grazing areas would be monitored to determine when cattle should be moved to prevent over use.
- Utilize salt to improve livestock distribution. Salt a reasonable distance away from water or natural congregating areas such as roads, trails, and saddles in hills, and avoid key areas. Move salt when distribution objectives are not being met or to correct localized overuse problems.
- Access roads for the maintenance of grazing improvements shall be engineered to facilitate reasonable control and disposal of water, to control erosion, and make the best possible use of topographical features, where possible. Access roads shall not be placed along or parallel to the stream channel within the streamside management zone. Crossing shall be perpendicular to the stream and the number of crossings should be minimized. Road gradients should not exceed 10 percent except for short lengths where more acceptable design criteria are prevented. All cuts and fills will be stabilized.
- Drainage structures will be engineered to provide adequate surface drainage to meet site specific criteria and runoff conditions. Culverts, bridges or grade dips for water management shall be provided at all natural drainage ways. Roadside ditches shall be engineered to provide surface drainage for the roadway and deep enough to serve as outlets for subsurface drainage. Drainage channels shall be sited on stable grades or protected with structures or linings for stability.
- Rolling dips or water bars shall be incorporated into design criteria to control surface runoff. These should be maintained periodically to ensure proper function. Structures shall be placed on all water bars or rolling dip outlets to trap sediment and slow erosive force of water. Lead-out ditches shall not be placed directly into watercourses. Water quality shall be protected during and after construction by erosion-control facilities and maintenance. Filter strips, sediment and water control basins, as well as other accepted conservation practices shall be used and maintained as needed.

## Appendix D: Apache-Sitgreaves Forest Plan Consistency

Project-level environmental analyses such as this one are tiered to the Environmental Impact Statement for the ASNFs' Forest Plan and the provisions of the Forest Plan, which include desired conditions, objectives, standards, and guidelines. These requirements are delineated by resource and compliance with the requirements takes the following forms:

- For desired conditions:
  - Maintain or make progress toward one or more of the desired conditions of a plan without adversely affecting progress toward, or maintenance of, other desired conditions; or
  - Be neutral with regard to progress toward plan desired conditions; or
  - Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward or maintenance of one or more desired conditions in the short term; or
  - Maintain or make progress toward one or more of the desired conditions over the long term, even if the project or activity would adversely affect progress toward other desired conditions in a negligible way over the long term.
- For objectives:
  - A project or activity is consistent with the objectives of the plan if it contributes to or does not prevent the attainment of any applicable objectives.
- For standards:
  - The project or activity is designed in exact accord with the standard.
- For guidelines:
  - The project or activity is designed exactly in accord with the guideline; or
  - A project or activity design varies from the exact words of the guideline, but it is as effective in meeting the purpose of the guideline to contribute to the maintenance or attainment of the relevant desired conditions and objectives.

The detailed Apache-Sitgreaves National Forest Land and Resource Management Plan (2015) requirements applicable to this proposal are:

### *Soils Desired Conditions (DCs)*

- Soil condition rating is satisfactory.
- Soils are stable within their natural capability. Vegetation and litter limit accelerated erosion (e.g., rills, gullies, root exposure, topsoil loss) and contribute to soil deposition and development.
- Soils provide for diverse native plant species. Vegetative ground cover (herbaceous vegetation and litter) is distributed evenly across the soil surface to promote nutrient cycling, water infiltration, and to maintain natural fire regimes.
- Biological soil crusts (e.g., mosses, lichens, algae, liverworts) are present and reestablished if potential exists.
- Soil loss rates do not exceed tolerance soil loss rates.

### ***Soils Standards & Guidelines (S&Gs)***

- Projects with ground-disturbing activities should be designed to minimize long- and short term impacts to soils resources. Where disturbance cannot be avoided, project specific soil and water conservation practices should be developed.
- Severely disturbed sites should be revegetated with native plant species when loss of long term soil productivity is evident.

### ***Water Resources DCs***

- Vegetation and litter is sufficient to maintain and improve water infiltration, nutrient cycling, and soil stability.
- Water quality, stream channel stability, and aquatic habitats retain their inherent resilience to natural and other disturbances.
- Water resources maintain the capability to respond and adjust to disturbances without long term adverse changes.
- Vegetation and soil conditions above the floodplain protect downstream water quality, quantity, and aquatic habitat from negative effects of precipitation events (e.g. flooding and sediment produced above the level needed for maintenance)
- Stream channels and floodplains are dynamic and resilient to disturbances. The water and sediment balance between streams and their watersheds allow a natural frequency of low and high flows.

### ***Water Resources S&Gs***

- Projects with ground-disturbing activities should be designed to minimize long- and short term impacts to water resources. Where disturbance cannot be avoided, project specific soil and water conservation practices and BMPs should be developed.
- Streams, streambanks, shorelines, lakes, wetlands, and other bodies of water should be protected from detrimental changes in water temperature and sediment to protect aquatic species and riparian habitat.
- To protect water quality and aquatic species, heavy equipment and vehicles driven into a water body to accomplish work should be completely clean of petroleum residue. Water levels should be below the gear boxes of the equipment in use. Lubricants and fuels should be sealed such that inundation by water should not result in leaks.

### ***All Potential Natural Vegetation Types (PNVTs) DC***

- Vegetative ground cover (herbaceous vegetation and litter cover) is optimized to protect and enrich soils and promote water infiltration. There is a diverse mix of cool and warm season grasses and desirable forbs species. Organic soil cover and herbaceous vegetation protect soil, facilitate moisture infiltration, and contribute to plant and animal diversity and ecosystem function.
- Herbivory is in balance with available forage (i.e., grazing and browsing by authorized livestock, wild horses, and wildlife do not exceed available forage production within established use levels).
- Grasses, forbs, shrubs, and litter are abundant and continuous to support natural fire regimes.

### ***All PNVT S&Gs***

- Vegetation treatments shall include measures to reduce the potential for introduction of invasive plants and animals and damage from nonnative insects and diseases
- Project plans should include quantitative and/or qualitative objectives for implementation monitoring and effectiveness monitoring to assist in moving toward or maintaining desired conditions.

### ***Riparian PNVTs DCs***

- Natural ecological disturbances (e.g., flooding, scouring) promote a diverse plant structure consisting of herbaceous, shrub, and tree species of all ages and size classes necessary for the recruitment of riparian-dependent species.
- Riparian-wetland conditions maintain water-related processes (e.g., hydrologic, hydraulic, geomorphic). They also maintain the physical and biological community characteristics, functions, and processes.
- Stream (lotic) riparian-wetland areas have vegetation, landform, and/or large coarse woody debris to dissipate stream energy associated with high waterflow.
- Streams and their adjacent floodplains are capable of filtering, processing, and storing sediment; aiding floodplain development; improving floodwater retention; and increasing groundwater recharge.
- Vegetation and root masses stabilize streambanks, islands, and shoreline features against the cutting action of water.
- Wetland riparian areas are capable of filtering sediment and aiding floodplain development that contribute to water retention and groundwater recharge.
- Soil compaction from forest activities (e.g., vehicle use, recreation, and livestock grazing) does not negatively impact riparian areas.
- Riparian vegetation consists mostly of native species that support a wide range of vertebrate and invertebrate species and are free of invasive plant and animal species.
- Riparian obligate species within wet meadows, streambanks and active floodplains provide sufficient vegetative ground cover (herbaceous vegetation and litter cover) to protect and enrich soils, trap sediment, mitigate flood energy, stabilize streambanks, and provide for wildlife and plant needs.
- Large coarse woody debris provides stability to riparian areas and stream bottoms lacking geologic control (e.g., bedrock) or geomorphic features (e.g., functioning floodplains, stream sinuosity, and width/depth ratio).

### ***Riparian S&Gs***

- Ground-disturbing projects (including prescribed fire) which may degrade long term riparian conditions should be avoided.
- Wet meadows and cienegas should not be used for concentrated activities (e.g., equipment storage, forest product or mineral stockpiling, livestock handling facilities, special uses) that cause damage to soil and vegetation.
- Active grazing allotments should be managed to maintain or improve to desired riparian conditions.

### ***Other PNVTs DCs***

- Madrean Pine-Oak PNVT - Grasses, forbs, shrubs, needles, leaves, and small trees support the natural fire regime. The larger proportion (60 percent or greater) of soil cover is composed of grasses and forbs as opposed to needles and leaves.
- Madrean Pine-Oak PNVT - Perennial herbaceous species dominate and include native grasses, grass-like plants (sedges and rushes), and forbs, and in some locations, a diversity of shrubs.
- Semi-Desert Grasslands PNVT - Vegetative ground cover (herbaceous vegetation and litter cover) is optimized (as defined by the TES map units) to prevent accelerated erosion, dissipate rainfall, facilitate the natural fire regimes, and provide wildlife and insect habitat. Ungrazed herbaceous vegetation heights range from 7 to 32 inches depending on grassland type.

### ***Livestock Grazing DCs***

- Livestock grazing and associated activities contribute to healthy, diverse plant communities, satisfactory condition soils, and wildlife habitat.
- Livestock grazing is in balance with available forage (i.e., grazing and browsing by authorized livestock, wild horses, and wildlife do not exceed available forage production within established use levels).

### ***Livestock Grazing S&Gs***

- Critical areas should be managed to address the inherent or unique site factors, condition, values, or potential conflicts associated with them.
- Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture.
- New livestock troughs, tanks, and holding facilities should be located out of riparian areas to reduce concentration of livestock in these areas. Existing facilities in riparian areas should be modified, relocated, or removed where their presence is determined to inhibit movement toward desired riparian or aquatic conditions.
- As areas are mechanically treated or burned, or after large disturbances, timing of livestock grazing should be modified as needed, in order to move toward desired conditions and to accomplish the objectives for the treatment.
- Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that plants providing for these needs remain at or move toward a healthy, persistent state.
- To minimize potential resource impacts from livestock, salt or nutritional supplements should not be placed within a quarter of a mile of any riparian area or water source.
- To prevent resource damage (e.g., streambanks) and disturbance to federally listed and sensitive wildlife species, trailing of livestock should not occur along riparian areas. Where no alternative route is available, approval may be granted where effective mitigation measures are implemented (e.g., timing of trailing, number of livestock trailed at one time).

### ***Riparian PNVTs Desired Conditions (DCs)***

- Project plans should include quantitative and/or qualitative objectives for implementation monitoring and effectiveness monitoring to assist in moving toward or maintaining desired conditions.
- Natural ecological disturbances (e.g., flooding, scouring) promote a diverse plant structure consisting of herbaceous, shrub, and tree species of all ages and size classes necessary for the recruitment of riparian-dependent species.
- Riparian-wetland conditions maintain water-related processes (e.g., hydrologic, hydraulic, geomorphic). They also maintain the physical and biological community characteristics, functions, and processes.
- Stream (lotic) riparian-wetland areas have vegetation, landform, and/or large coarse woody debris to dissipate stream energy associated with high waterflow.
- Streams and their adjacent floodplains are capable of filtering, processing, and storing sediment; aiding floodplain development; improving floodwater retention; and increasing groundwater recharge.
- Vegetation and root masses stabilize streambanks, islands, and shoreline features against the cutting action of water.

- Ponding and channel characteristics provide habitat, water depth, water duration, and the temperatures necessary for maintaining populations of riparian-dependent species and for their dispersal.
- Lentic riparian areas (e.g., wet meadows, fens, bogs) have vegetation and landform present to dissipate wind action, wave action, and overland flow from uplands.
- Wetland riparian areas are capable of filtering sediment and aiding floodplain development that contribute to water retention and groundwater recharge.
- Willows (e.g., Bebb, Geyer, Arizona, Goodding's) are reproducing with all age classes present, where the potential exists.
- The spatial extent of wetlands is maintained.
- Soil compaction from forest activities (e.g., vehicle use, recreation, livestock grazing) does not negatively impact riparian areas.
- Riparian vegetation consists mostly of native species that support a wide range of vertebrate and invertebrate species and are free of invasive plant and animal species.
- Diversity and density of riparian forest vegetation provides for breeding, escape, hiding, and resting cover for wildlife and provides travelways between other habitat areas and seasonal ranges.
- The ecological function of riparian areas is resilient to animal and human use.
- Riparian obligate species within wet meadows, around springs and seeps, along streambanks, and active floodplains provide sufficient vegetative ground cover (herbaceous vegetation, litter, and woody riparian species) to protect and enrich soils, trap sediment, mitigate flood energy, stabilize streambanks, and provide for wildlife and plant needs.
- Riparian soil productivity is optimized as described by the specific TES map unit as indicated by the vigor of the herbaceous vegetation community. Based on species composition, ungrazed plant heights range from 10 inches to 36 inches.
- Floodplains and adjacent upland areas provide diverse habitat components (e.g., vegetation, debris, logs) as necessary for migration, hibernation, and brumation (extended inactivity) specific to the needs of riparian-obligate species (e.g., New Mexico meadow jumping mouse, Arizona montane vole, narrow-headed gartersnake).
- Large coarse woody debris provides stability to riparian areas and stream bottoms lacking geologic control (e.g., bedrock) or geomorphic features (e.g., functioning floodplains, stream sinuosity, width/depth ratio).
- Vegetation is structurally diverse, often dense, providing for high bird species diversity and abundance, especially neotropical migratory birds. It includes large trees and snags in the cottonwood-willow and mixed broadleaf deciduous riparian forests to support species such as beaver, yellow-billed cuckoo, bald eagles, Arizona gray squirrel, and various bat species.
- Ecological conditions for habitat quality, distribution, and abundance contribute to self-sustaining populations of native and desirable nonnative plants and animals that are healthy, well distributed, connected, and genetically diverse. Conditions provide for the life history, distribution, and natural population fluctuations of the species within the capability of the landscape.
- Watersheds exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition.

### ***Riparian Guidelines***

- Ground-disturbing projects (including prescribed fire) which may degrade long term riparian conditions should be avoided.

- Wet meadows, springs, seeps and cienegas should not be used for concentrated activities (e.g., equipment storage, forest product or mineral stockpiling, livestock handling facilities, special uses) that cause damage to soil and vegetation.
- Active grazing allotments should be managed to maintain or improve to desired riparian conditions.
- Storage of fuels and other toxicants should be located at least 100 feet outside of riparian areas to prevent spills that could impair water quality or harm aquatic species.
- Equipment should be fueled or serviced at least 100 feet outside of riparian areas to prevent spills that could impair water quality or harm aquatic species.
- Construction or maintenance equipment service areas should be located at least 100 feet from riparian areas, and treated to prevent gas, oil, or other contaminants from washing or leaching into streams.

### ***Livestock Grazing DCs***

- Livestock grazing and associated activities occur such that healthy, diverse plant communities, satisfactory condition soils, and wildlife habitat are maintained or improved.

### ***Livestock Grazing Guidelines***

- Critical areas should be managed to address the inherent or unique site factors, conditions, values, or potential conflicts associated with them.
- Grazing use on seasonal allotments should be timed to the appropriate plant growth stage and soil moisture.
- New livestock troughs, tanks, and holding facilities should be located out of riparian areas to reduce concentration of livestock in these areas. Existing facilities in riparian areas should be modified, relocated, or removed where their presence is determined to inhibit movement toward desired riparian or aquatic conditions.
- Forage, browse, and cover needs of wildlife, authorized livestock, and wild horses should be managed in balance with available forage so that providing for these needs remain at or move toward a healthy, persistent state.
- To minimize potential resource impacts from livestock, salt or nutritional supplements should not be placed within a quarter of a mile of any riparian area or water source. Salt or nutritional supplements should also be located to minimize herbivory impacts to aspen clones.
- To prevent resource damage (e.g., streambanks) and disturbance to federally listed and sensitive wildlife species, trailing of livestock should not occur along riparian areas. Where no alternative route is available, approval may be granted where effective mitigation measures are implemented (e.g., timing of trailing, number of livestock trailed at one time).

### ***Water Resources DCs***

- Water quality, stream channel stability, and aquatic habitats retain their inherent resilience to natural and other disturbances.
- Water resources maintain the capability to respond and adjust to disturbances without long term adverse changes.
- Vegetation and soil conditions above the floodplain protect downstream water quality, quantity, and aquatic habitat.

- Instream flows provide for channel and floodplain maintenance, recharge of riparian aquifers, water quality, and minimal temperature fluctuations.
- Streamflows provide connectivity among fish populations and provide unobstructed routes critical for fulfilling needs of aquatic, riparian dependent, and many upland species of plants and animals.
- Water quantity meets the needs for forest administration and authorized activities (e.g., livestock grazing, recreation, firefighting, domestic use, road maintenance).
- Stream channels and floodplains are dynamic and resilient to disturbances. The water and sediment balance between streams and their watersheds allow a natural frequency of low and high flows.
- Stream condition is sufficient to withstand floods without disrupting normal stream characteristics (e.g., water transport, sediment, woody material) or altering stream dimensions (e.g., bank-full width, depth, slope, sinuosity).
- Floodplains are functioning and lessen the impacts of floods on human safety, health, and welfare.
- Water quality meets or exceeds Arizona State standards or Environmental Protection Agency water quality standards for designated uses.
- Water quality meets the needs of desirable aquatic species such as the California floater, northern and Chiricahua leopard frog, and invertebrates that support fish populations.

### ***Water Resources Guidelines***

- Projects with ground-disturbing activities should be designed to minimize long and short term impacts to water resources. Where disturbance cannot be avoided, project specific soil and water conservation practices and BMPs should be developed.
- Streams, streambanks, shorelines, lakes, wetlands, seeps, springs and other bodies of water should be protected from detrimental changes [11] in water temperature and sediment to protect aquatic species and riparian habitat.
- Aquatic management zones should be in place between streams and disturbed areas and/or road locations to maintain water quality and suitable stream temperatures for aquatic species.
- As State of Arizona water rights permits (e.g., water impoundments, diversions) are issued, the base level of instream flow should be retained by the Apache-Sitgreaves NFs.

### ***Water Developments DCs***

- Water developments contribute to fish, wildlife, and riparian habitats as well as scenic and aesthetic values.
- Apache-Sitgreaves water rights are secure and contribute to livestock, recreation, wildlife and administrative uses.

### ***Water Developments Standards***

- Forest Service water rights must be put to beneficial use and that use documented and consistent with ADWR regulations.