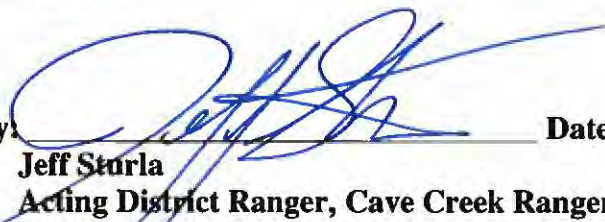


**COPPER CREEK
ALLOTMENT MANAGEMENT PLAN
CAVE CREEK RANGER DISTRICT
TONTO NATIONAL FOREST**

Prepared By:  Date 5/8/2018
Eric Hoskins, Range Staff Cave Creek Ranger District

Prepared By:  Date 5-8-2018
Keenan Bender, Rangeland Management Specialist Cave Creek Ranger District

Approved By:  Date 5/8/2018
Jeff Sturla
Acting District Ranger, Cave Creek Ranger District



COPPER CREEK
Copper Creek Grazing Allotment Management Plan
Cave Creek Ranger District, Tonto NF



This allotment management plan was developed using information from the 2017 Environmental Assessment (EA) and subsequent Notice of Decision for the allotment. The EA was developed following procedures outlined in the National Environmental Policy Act (NEPA) and other national and regional policy. The Decision Notice and Finding of No Significant Impact, which documents the selection of the Proposed Action to address resource concerns, was signed by the decision maker on January 26, 2018.

Allotment Description

Copper Creek allotment is approximately 35,000 acres in southeast Yavapai County, 50 miles north of Phoenix, Arizona. It is located at the northwest portion of the Cave Creek Ranger District of the Tonto National Forest. Vegetation on the allotment is made up of tobosa grassland, semi desert grassland, and desert scrub in the higher elevations. Copper Creek allotment consists primarily of five pastures: Bobcat, Brooklyn, Cornstalk, Granite-Mesa Butte, and Perry Mesa.

Operation

The Copper Creek Grazing Allotment is being managed as a cow/calf year-long cattle grazing operation where the bulls are run with the cows year-long. This allotment is also currently being run in conjunction with the Horseshoe Allotment on the Bureau of Land Management (BLM) to allow greater flexibility and management of resources. The Copper Creek allotment is divided into 5 pastures and a holding pasture that are used in a flexible selective rest-rotation pattern so that each pasture does not receive use at the same time each year.

A selective rest-rotation strategy is comprised of two components. The selective component uses current climatic and on the ground monitoring data along with utilization triggers to prompt livestock rotations. The rest component is a period of no grazing, or deferment, within a pasture to allow for the physiological needs of plant recovery and reproduction after grazing has occurred within that pasture.

Annual Operating Instructions (AOI) On an annual basis, the Forest and permittee will jointly prepare an annual plan, referred to as the AOI which sets forth:

- The numbers, class of livestock and the timing and duration of use for the current grazing year.
- The planned sequence of grazing in pastures on the allotment and the monitoring criteria that would be used to make changes.
- Structural and non-structural improvements to be constructed, reconstructed or maintained and who is responsible for those activities.
- Allowable use or other standards to be applied and followed by the permittee to properly manage livestock.
- Monitoring for the current grazing year would include documentation of compliance with the terms and conditions in the grazing permit, AMP and AOI.

Permitted Numbers

Permitted use numbers will vary from 200 to 500 head of livestock which is equal to 2,400 to 6,000 Animal Unit Months (AUMs), year-long and up to 250 yearlings (which is equal to 788 AUMs for 250 yearlings for four and a half months) for natural increase (last year's calves) from January 1 to May 15, annually. Table 1 shows the maximum permitted numbers that would be allowed for the Copper Creek Grazing Allotment.

Table 1: Stocking Numbers

Class of animal	Begin Date	End Date	Maximum Stocking #	Maximum Stocking in AUMs
Cow/Calf pairs	1-Mar	28-Feb	200-500	2,400 to 6,000
Yearlings	1-Jan	15-May	Up to 250	Up to 787.5

Annual authorized livestock numbers are the number of cattle that are determined can be appropriately grazed in a given year based on precipitation, pasture rotation, forage production and other resource concerns. This number can be adjusted on a yearly basis but will not exceed the permitted number of livestock. A stock and monitor approach, consistent with regional Forest Service direction Region 3 Supplement to FSH 2209.13 Chapter 90, will be used to establish grazing capacity over the long term (5 to 10 years). Actual permitted levels of grazing would be determined annually by the Cave Creek District Ranger with the permittee based on the results of monitoring and successful implementation of management practices.

The length of the grazing period within each pasture will also be considered and managed for the desired grazing intensity and utilization guidelines. Range readiness of pastures may be checked along with rest and recovery of key species to ensure proper rest and recovery of those plant species has occurred, if due to circumstances such as drought, fire, exceedance by wildlife use, or any other possible reason that plants have not recovered sufficiently to meet their key physiological requirements, grazing could be delayed or pushed off until sufficient plant recovery has occurred.

Goals, Objectives and Management

Livestock management practices such as herding and salting are critical to achieve proper livestock distribution within each unit/pasture. The Forest will work with the permittee and other specialists to implement strategies in order to achieve proper distribution, protection, and management of cattle on the allotment.

Tonto National Forest Grazing Practices are as follows: Decision Notice for the Copper Creek Grazing Authorization Project Page 16 of 23

- Forest Plan Standards and Guidelines applicable to livestock grazing will be followed (Forest Plan, p. 24).
- Salt and/or supplements will be placed where forage is abundant and current grazing use levels are low. Salt and/or supplements will not be placed any closer than one quarter mile from available water, recreation sites, or designated trails except where prior written approval had been obtained from the District Ranger.
- No salting will occur within or adjacent to identified heritage sites. Salt will be removed from pastures when cattle have left an area, and not placed within a pasture until the cattle arrive. Additionally, salt will not be placed in the same location(s) each year.

- Troughs will be left full of water and operational year round for wildlife accessibility, unless in limited circumstances where extreme freezing conditions may damage facilities.
- When entering the next scheduled pasture, all livestock will be removed from the previous pasture within two weeks (dependent on terrain).
- Permittee will ensure that enough time is allowed to remove livestock to meet the pasture move date(s) and avoid unauthorized and excess use.
- Permittee will ensure all infrastructures are in functioning condition prior to entering the next scheduled pasture.

The following is a list of when administrative actions will be necessary in the management of this allotment:

- Monitoring shows management objectives have not been achieved or that trend toward achieving desired conditions is not improving or improving at an adequate rate.
- Annual indicators of grazing use or grazing guidelines are not met.
- Climatic events, fire, flood, or uses and activities detrimentally impact resource conditions and a modification of grazing use is needed to provide for recovery of the site.

There are several types of administrative actions that could take place within the allotment. These actions will comply with the Forest Plan and mitigations detailed later in this section. The following list includes some of these actions:

- Extending or shortening time in a pasture based on utilization levels in uplands and riparian areas.
- Assessing the readiness of a pasture and changing its position in the rotation for the season.
- Time or season of pasture use.
- Resting a pasture for one or more growing seasons.
- High intensity, short duration grazing.
- In the event of extended drought, severe fire, or depleted rangelands, complete removal of livestock until rangelands have recovered.
- Decrease or increase herd size within the limits of the permitted numbers
- Temporarily closing off water in a portion of a pasture to manipulate grazing pressure and intensity of use.
- Use of salt and mineral blocks to aid in distribution, especially away from critical areas such as riparian areas.
- Excluding livestock from specific areas temporarily or permanently for other resource objectives.
- Changing or limiting season of use to minimize impacts to riparian vegetation and water quality.

If monitoring indicates desired conditions are not being met, the District Rangeland Management Specialist, in consultation with the permittee and resource specialists, as appropriate, will:

- Evaluate the potential cause for not meeting desired condition or indicator such as utilization.
- Evaluate the need to implement alternative strategies
- Generate documentation necessary in the AOI and/or permit and allotment files for the action to be implemented.
- As necessary, conduct additional site specific surveying, such as for cultural resources.

Objectives identified in the EA include:

- Soils: According to Forest Service Manual 2550.2, the desired conditions for soils are to “maintain or restore soil quality on National Forest System lands. Manage resource uses and soil resources on NFS lands to sustain ecological processes and condition so that desired ecosystem services are provided in perpetuity.” Further, the Forest Plan indicates that projects should improve soil productivity (p. 19). One key way of ensuring this is to maintain effective ground cover so that no more than 30% is bare ground.
- Watershed: According to the Forest Plan, the Tonto National Forest should manage watersheds so as to improve them to a satisfactory or better condition. As the Watershed Condition Framework is currently the Forest Service’s accepted measure of watershed condition, satisfactory equates to a rating of “functioning properly”.

Table 2: Watershed Condition for 6th Code Watersheds in Project Area

6th Code Watershed	Percent of 6th Code Watershed within Allotment	Condition
Bishop Creek Watershed	59	Impaired
Tank Creek Watershed	43	Functioning at risk
Silver Creek Watershed	42	Functioning at risk
Squaw Creek Watershed	15	Functioning at risk
Lousy Canyon-Agua Fria River Watershed	13	Functioning at risk

- Wildlife: provide for species diversity, maintaining viable populations of existing species, improving habitat for selected species and manage to increase population levels of threatened and endangered species. Provide at least 40% ground cover around springs and riparian areas for wildlife hiding cover. Continue to provide access to water for game and non-game species on the allotment. Wildlife escape ramps and access ramps will be provided and maintained on all cattle troughs on the allotment. In riparian areas across the allotment provide for regeneration of vegetation to achieve multiple age classes and complex vegetative structure for wildlife habitat. To provide for needs of special status species
- Archaeology: continue to survey for archaeological sites prior to any ground-disturbing projects. Do not place salt or mineral blocks near or in any archeological sites and manage cattle in a way that minimizes or reduces any current impacts to heritage sites

from grazing. If any disturbance is occurring to observed archeological sites report this to the agency. Any time heavy equipment is planned on being used on the allotment prior approval must be received from the agency.

Range Improvements

1). Existing Structures: Fencing, waters, handling facilities, etc. are critical components of any grazing management plan. All range improvements assigned to the permittee (as part 3 of the Term Grazing Permit) need to be maintained to Forest Service Standards as outlined in FSH 2209.22(R3) in order to facilitate proper management of the Allotment. Any improvements that are no longer necessary need to be identified by the permittee and agreed upon by a Forest Service official. These improvements may be removed from the Forest. A permit modification will be completed to remove the structure from the permittee's maintenance responsibilities.

The permittee must receive District approval prior to bringing heavy equipment onto the Forest. Maintenance on existing range improvements may require additional archeological or biological clearances prior to beginning any work. Any maintenance or reconstruction will be confined within original site disturbance and construction. Poles, posts, and trough framing materials used in the construction of the water development will be maintained, repaired, or replaced as needed. In addition the following guidance will be followed when maintaining structural range improvements:

Trough, Water System, and Stock Pond Standards

- New spring developments will be constructed with the spring box designed so that residual flow is left at the spring head to prevent dewatering.
- Outlet pipes and valves from head boxes will be functioning and any leaking should be kept to a very minimum.
- Above ground pipeline support structures will be maintained to keep the pipes at gradient and prevent sagging.
- Pipeline leaks will be repaired or the damaged section will be replaced with materials similar to the original construction materials.
- Pipelines with air and drain valves will be covered with a screen to prevent rodents and dirt from entering the pipe. Screens will be replaced as needed.
- Pipelines with valve covers boxes will be kept covered and repaired when needed.
- Pipelines will use existing pipeline routes for replacement of existing lines whenever possible. Placement of above or below ground lines will be determined on a site-specific basis.
- Water troughs will be kept at heights that make them useable to livestock. Troughs which become elevated from trampling livestock may be periodically backfilled to maintain a useable height.
- Troughs which become uneven due to settling will be reset and leveled.
- Troughs, storage tanks, and pipelines will be drained and cleaned periodically to prevent moss and debris buildup and damage from freezing.

- Stock water ponds will be kept clear of debris, dead animals, etc. Spillways will be cleaned and maintained to prevent washing out or becoming plugged. Rodent damage and damaging vegetation on dams will be reported to the Forest Service.
- Stock water development components (e.g., rusted out troughs, broken sections of pipe, etc.) replaced during maintenance or reconstruction will be removed and properly disposed of.
- Bottoms of troughs will be kept clear of the ground with at least 2 inches to 4 inches of clearance under the bottom of the trough to prevent rusting or decomposition.
- Water will not be allowed to overflow the sides of the troughs. Overflow pipes must be kept clear. Overflow water will be piped away from troughs at least 50 feet. The end of the overflow pipe must be protected from trampling by livestock. Water from overflow pipe must be directed away from the trough area and returned to its source.
- Inlet and outlet pipe shall be protected by anchoring to the trough with a single post next to the vertical pipe and a brace or pole supporting the horizontal pipe. Inlet and outlet pipeline will be buried as much as possible for their protection.
- Troughs will be equipped with a wildlife escape ramp from which birds and rodents can escape or drink from the trough.

Fence and Corral Standards

- Broken or rotten posts, broken braces and missing staples will be replaced where and when needed to maintain the fence.
- Wires will be re-stretched where needed.
- Broken or missing stays will be replaced where needed.
- Top wire on all range fences should be kept under 42 inches in height.
- Staples will not be driven so deep into the post that they scar or create a weak spot in the wire.
- Gates will be closed before livestock enter the grazing units and opened and tied back after livestock leave the allotment.
- Wire gate tension will be sufficient to prevent the gate from sagging and still be easily opened and closed. Gate loops will be made from smooth wire, not barbed wire.
- Trees which fall on fences will be cut and removed when and where needed; wire, if broken, will be spliced and re-stretched; poles if broken will be replaced.
- Broken or rotten sections of log or pole fences and corrals will be replaced as needed.
- Corrals will be kept clean of litter, in good repair, and in useable condition.
- Metal components of range fences and corrals (e.g., wire, stays, t-posts, gates, etc.) replaced during maintenance or reconstruction will be removed from the Forest and properly disposed of.
- All broken fence wire will be spliced and repaired in such a manner that tension on a wire can be maintained. Wire splices will be made with 12 gauge size tie wire or type of wire used in initial construction.

2). New Improvements: To improve management of livestock on the allotment, additional fencing, livestock handling facilities, springs developments, and additional watering sources

might be necessary to facilitate better livestock distribution, reduce undesirable effects to riparian vegetation and wildlife habitat, or otherwise improve the rangeland resource.

All new construction of proposed structural range improvements must have an archeological clearance prior to any work. The Forest Service should receive advance notice for any proposed improvements to allow for timely completion of all required planning, field visits and clearances. Improvements will be authorized through a permit modification form signed by the Ranger then provided to the permittee prior to work being started. Once the project is complete, an inspection will be conducted to ensure that the completed work meets Forest Service Standards, the site is clean, and improvement functional.

Wildlife

Since site specific information regarding precise location and timing of all range improvements are not available at this time, the Forest Service will implement the following actions to protect listed species:

- For improvements proposed in the Perry Mesa pasture, Sonoran desert tortoise habitat, if present, will be avoided to minimize overlap with livestock concentration areas.
- All water developments will include wildlife access and escape ramps. When possible, waters will be kept available to wildlife year round.
- All fencing will be built to Forest Service standards to provide for wildlife passage through the fence. At a minimum, this will be a four-strand fence with smooth bottom wire 18 inches off the ground and a total height of 42 inches or less.

Riparian

- Existing developed and new developed springs should be fenced to exclude livestock access in order to protect the spring and spring box. A trough(s) will be located outside of the enclosure to provide water for wildlife and livestock.
- Livestock will not be trailed through key riparian areas.
- Salt and/or mineral supplements will be placed at least a quarter mile from riparian areas.
- New troughs will be placed in the uplands, at least 400 feet away from riparian areas.

Heritage

There are specific archaeological requirements for different maintenance activities. Maintenance activities exempt from further review according to the programmatic agreement with the Arizona State Historic Preservation Officer (SHPO):

- Pipeline repair or replacement within existing footprint
- Fence repair or replacement within existing footprint
- Corral repair or replacement within existing footprint
- Water trough replacement within existing footprint

If no new ground disturbance (beyond the existing footprint of the improvement) is needed then work may proceed. The permittee will keep a record of the maintenance activities and report them to District Range Staff each year during their Annual Operating Instructions (AOI) meeting. If heavy equipment (backhoe, dozer, excavator, etc.) is required, District Range Staff will authorize its use in their AOI. Stock tank cleaning using an existing route may occur after inspection by District Range Staff and authorization in the AOI. The inspection would only need to occur once and will be documented in the improvement file for future use. Other activities will require additional evaluation, including:

- Stock tank cleaning away from roads where prior access is unknown
- Locations where there are known heritage resources within the project area
- Wells re-drilled next to existing wells
- New windmill construction or new windmills built next to existing windmills
- Fence installation in a new location or outside of existing fenceline footprint
- Replacement of any facility that is outside of its existing footprint

These activities require consultation with the heritage staff before the permittee may proceed. District Range Specialists will prepare documentation that clearly articulates the methods and conditions under which maintenance will occur. This document will be evaluated by Heritage Staff then authorization with sideboards will be given for work to proceed. These guidelines only refer to Heritage Resources. Any other requirements in the term grazing permit, such as restrictions due to Threatened or Endangered Species or Wilderness still apply.

There are currently two fence projects and thirteen water development projects that have been cleared with current NEPA. Written authorization is required prior to implementation (Table 3). These projects will be flagged by the Forest Service prior to construction to ensure they are within the completed archeological clearances. All projects must be constructed according to Forest Service Standards (FSH 2209.22 R3).

TRAVEL MANAGEMENT

The following on-going activities requiring motor vehicle use off-road are authorized by this AMP to conduct livestock grazing activities on National Forest System lands within the Tonto National Forest:

- Off-road vehicle use by pickup, trailer, ATV, UTV, or motorcycle needed to transport materials or machinery to maintain or inspect structural range improvements (fences, corrals, pipelines, wells, windmills, and storage tanks, water delivery systems, troughs, earthen tanks) assigned in Part 3 of the grazing permit as the permit holder's responsibility for maintenance is authorized. Existing routes or the shortest, most direct route to the improvement must be used and route construction (i.e. blading a path) would not be allowed without additional authorization.
- Using an off-road vehicle to place supplements in strategic locations for livestock management purposes may be authorized by the District Ranger in the AOI when requested.

Vehicle use to gather or move livestock off-road is not authorized. Cross-country motorized travel is not allowed when conditions are such that cross-country travel would cause unacceptable natural and/or heritage resource damage. Off-road use of heavy equipment (i.e. backhoe, dozer, loader, etc.) may be authorized for range improvement development as needed. Heritage and Biological clearance must be obtained before cross-country travel to construct new range improvements, including the route to access the development is approved. No additional Section 106 cultural compliance is required for specific limited-use authorizations already covered by separate decisions under the National Environmental Policy Act per The Region 3 Region-wide Travel Management protocol with the Arizona State Historic Preservation Officer. Motor vehicle use in designated wilderness areas would continue to be managed consistent with the provisions of the Wilderness Act [Section 4(d)(4)(2)] that provides for limited exceptions for grazing livestock as further defined in the Congressional Guidelines (Forest Service Manual 2323.22).

Table 1: Authorized Fencing Projects on the Copper Creek Allotment

Improvement ID ¹	Pasture	Legal Location	Description
FN1	Brooklyn	T9.5NR3E Sec.36	Installation of barbwire fence at south end of FR 14 to protect heritage resource from unauthorized vehicular traffic. This fence will be constructed with a pedestrian walk-through for ease of access to monitor the site. Heritage surveys conducted in 2017 revealed a better configuration for this fence to better protect the adjacent heritage resources. The fence configuration will be implemented according to these recommendations.
FN2	Granite Mesa	T10NR4E Sec. 26	Develop an approximate 75 foot by 125 foot fenced cattle holding area. This will allow the permittee gather and hold cattle which will improve livestock management. This fence is proposed to be installed within the first two years following this decision ¹ .

Table 2: Authorized Water Developments on the Copper Creek Allotment

Improvement ID ¹	Pasture	Legal	Description ²
WD1	Granite Mesa	T10NR4E Sect. 26,27,34	Addition of a pipeline, water storage and drinker. This will increase water availability in the uplands and better distribute cattle.
WD2	Perry Mesa	T9.5NR4E Sec.19	Development of a new well and addition of water storage tank. This will increase water availability in the uplands and better distribute cattle.
WD3	Perry Mesa	T9.5NR3E Sec.36, 35	Addition of livestock drinker, pipeline, and water storage on west end near Forest boundary. This will increase water availability in the uplands and better distribute cattle.
WD4	Perry Mesa	T9.5NR3E Sec.25, 26 and T9.5N, R4E, Sec 19	Installation of a pipeline from the previous proposed well to a new drinker. This will increase water availability in the uplands and better distribute cattle.

¹ A new improvement number will be given one the improvement is constructed according to our standard Range Improvement Numbering System

² This is a limited description and further information can be found in the 2240 files for each individual project.

Improvement ID ¹	Pasture	Legal	Description ²
WD5	Perry Mesa	T9NR3E Sec.16,21	Addition of a drinker and pipeline from the existing Point Extreme well. This will increase water availability in the uplands and better distribute cattle.
WD6	Perry Mesa	T9.5NR3E Sec.25	Addition of a drinker near the South Campbell stock tank. This will increase water availability in the uplands and better distribute cattle.
WD7	Brooklyn	T9.5NR3E Sec. 31	Addition of a drinker and water pipeline from an existing well. This will increase water availability in the uplands and better distribute cattle.
WD8	Brooklyn	T9.5NR3E Sec.20,19 T10NR4E Sec. 31	Addition of a drinker from the Cornstalk solar well. This will increase water availability in the uplands and better distribute cattle.
WD9	Granite Mesa	T10NR4E Sec. 33,34	Addition of a water line from Copper Spring to a new drinker and water storage. Development new well, drinker, and storage at north end of sec. 33. This will increase water availability in the uplands and better distribute cattle.
WD10	Granite Mesa	T10NR4E Sec.14	Addition of water pipeline from Rugged Windmill drinker and existing storage. This will increase water availability in the uplands and better distribute cattle.
WD11	Bobcat	T10NR4E Sect. 9, 10	Addition of a drinker and pipeline from Old mine Windmill. This will increase water availability in the uplands and better distribute cattle.
WD12	Brooklyn	T9.5NR3E Sec.28,33	Addition of a water line from Rosalie Spring to a new drinker and water storage. This will increase water availability in the uplands and better distribute cattle.
WD13	Bobcat	T10NR4E Sec. 4,5	Development of a new well, drinker, and storage. This will increase water availability in the uplands and better distribute cattle.

Monitoring

There are currently 9 key area monitoring locations on the Copper Creek Allotment. Data gathered over the past several years and summarized in the EA indicate that range conditions are moving towards Forest Objectives. Livestock use has been light to moderate with key perennial grass cover being variable year to year based on timing and intensity of precipitation received.

The objectives of monitoring is to determine whether management is being properly implemented and whether the actions are effective at achieving or moving toward desired conditions. Monitoring described below can occur throughout the grazing year and be conducted by Forest personnel in collaboration with grazing permittees and other Federal and State specialists. Monitoring should be conducted at regular intervals based on management changes and time scales and should be conducted in key areas. Key areas are described in "Sampling Vegetation Attributes" (Interagency Technical Reference, 1996) as indicator areas that are able to reflect what is happening on a larger area as a result of on-the-ground management actions. A key area should be a representative sample of a large stratum, such as a pasture, grazing allotment, wildlife habitat area, herd management area, watershed area, ect., depending on the

management objectives being addresses by the study. Proper selection of key areas requires appropriate stratification.

Effectiveness monitoring includes measurements to track condition and trend of upland and riparian vegetation, soil and watersheds. Monitoring would be implemented following procedures described in the Interagency Technical Reference and Region 3 Rangeland Analysis and Training Guide. This data will be interpreted to determine whether management is achieving desired conditions, whether changes in resource conditions are related to management and to determine whether modifications in management are necessary. Effectiveness monitoring would occur at least once over the ten-year term of the grazing authorization or more frequently if deemed necessary.

There are two types of upland effectiveness monitoring that has occurred on this allotment over the last 50 years, Parker Three-Step Clusters and the Common Non-Forested Vegetation Sampling Protocol (CNVSP). Parker Three-Step Clusters were established in the 1950s and work well in the tobosa grassland areas however due to the variety across the Tonto and the better quality data most monitoring is starting to be converted to the CNVSP protocol which provides additional information and usefulness above that of the Parkers.

It is the goal to have one key area to conduct effectiveness monitoring established in each pasture. Key areas are placed over existing monitoring sites where practical so that photographs can be continued to be taken in accordance with previous monitoring conducted at those sites to give historical perspective of vegetation changes over time. Where key areas are no longer useful but a long historical record exists for those sites, monitoring will be relocated to a new location but photographs will continue to be taken to provide historic photographic evidence of changes occurring in those locations.

Effectiveness monitoring for riparian areas could be conducted using Multiple Indicator Monitoring (MIM) of Stream Channels and Streamside Vegetation (Burton et al. 2011) or the most current acceptable method. Additional Proper Functioning Condition monitoring could be conducted where practical. It has been determined that in a reach of approximately 1,000 feet, sampling of 30 to 50 plants within that reach is necessary for statistically valid monitoring. Any riparian area that has the potential to have enough riparian vegetation for statistically valid monitoring but does not currently have a long enough reach of riparian vegetation will be managed more closely to provide for recruitment of riparian resource.

Additionally for riparian areas, riparian photo points have been established across the allotment. These riparian photo points will provide records of changes to these areas overtime and should be continued to help determine best management practices.

Implementation monitoring may occur at any time during the grazing year and would include such things as inspection reports, forage utilization measurements, livestock counts and facilities inspections. Upland utilization measurements are made following procedures found in the

Interagency Technical Reference and with consideration of Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands. Upland utilization will be measured on key species selected for each key area and should be conducted soon after pasture rotations are complete. Forage utilization will be managed at a levels corresponding to light to moderate intensity in order to provide for grazed plant recovery, increases in herbage production and retention of herbaceous litter to protect soils. Peer-reviewed grazing studies identifies conservative use as 30 – 40% average use of primary forage species based on pasture-wide utilization averaged over time (Holechek, et al, 2004). Consistent patterns of utilization in excess of moderate intensity would be used as a basis to modify management practices or reduce livestock numbers in subsequent grazing years.

For riparian areas, guidelines for use are as follows: *obligate riparian tree species* – limit use to <50% of terminal leaders (top 1/3 of plant) on palatable riparian tree species accessible to livestock (usually <6 feet tall); *deergrass* – limit use to, 40% of plant species biomass; *emergent species (rushes, sedges, cattails, horsetail)* – maintain six to eight inches of stubble height during the grazing period. The goal of the deergrass utilization guideline is primarily to provide residual vegetation for stream channel protection, and secondarily to protect plant vigor. Emergent vegetation is supported by perennial surface or subsurface water, and has high potential for regrowth following grazing. The goal of the emergent species guideline is to provide physical protection to the stream channel.

The sequence and timing of pasture moves will be set annually and adjusted through the use period based on monitoring of range readiness, ecological condition, and grazing impacts. If conservative use levels are reached before schedule move dates, livestock will be moved to the next scheduled pasture. If all pastures have been utilized before the end of the grazing season livestock will be removed from the allotment until the start of the next growing season.

While monitoring techniques as described above would be conducted in key areas, these would not be the sole locations for gathering information from the grazing allotment to make decisions about the timing, intensity, duration or frequency of livestock grazing in a given grazing season. The overall condition of the allotment and such things as distribution patterns or rangeland improvement conditions could be assessed at any given time to help make those decisions.

The permittee will be encouraged to participate in all monitoring activities. Records of actual use and movement dates will be kept by the permittee and provided to the District range staff at the annual authorization meeting each year.

Management of springs and key reaches: There are three stream with key reaches that will be monitored using the techniques described above. These three named streams are; Silver Creek, Bishop Creek and Copper Creek. Monitoring will be conducted to ensure that conditions are moving towards our desired conditions. If needed these streams could be fenced off to help manage livestock use in those areas.

Silver Creek

Silver Creek is mostly an intermittent stream supporting 3.1 miles of riparian habitat across the Bobcat pasture. This stream flows from east to west exiting the allotment and entering the Agua Fria National Monument. Two permanent photo point locations are located within the allotment, number one, near Silver Spring located at the extreme western part of the allotment, and number two, at the Forest Road 677 road crossing (Figure 1).

Bishop Creek

Bishop Creek is an intermittent stream supporting 5.8 miles of riparian habitat starting in the Granite-Mesa Butte pasture and continuing through the Bishop Creek enclosure (Figure 1). The stream flows from east to west, eventually leaving the allotment and entering the Agua Fria National Monument. Eight permanent photo point locations are located along the stream corridor (Figure 7). Photos were taken in 2015 showing the existing condition of the stream at selected photo point sites.

Copper Creek

Copper Creek is an intermittent stream supporting 4.5 miles of riparian habitat originating at Copper Spring in the Granite-Mesa Butte pasture and continuing into the Cornstalk pasture, eventually crossing the administrative site enclosure (Figure 1). As with Silver and Bishop Creeks, the stream flows from east to west leaving the allotment and entering the Agua Fria National Monument. There are eight permanent photo point locations along the stream corridor (Figure 1).

Springs

Silver and Copper Springs are located within the stream channels of their respective creeks (Figure 1). Silver Spring was filled in by accumulation of excess sand as observed during a site visit in the spring of 2015. Copper Spring is located in the headwaters of Copper Creek. At the time of the last site visit in May 2015, there was a large pool present at the source of the spring. Riparian vegetation extended several hundred feet downstream from the source area and was assessed as properly functioning with a very diverse composition of riparian species present including: Arizona sycamore, Arizona ash, Fremont cottonwood, willows, deergrass, and many others.

There are four upland springs within the allotment. From north to south these include; Bishop, Shirttail, Little Hutch, and Rosalie. Bishop, Shirttail, and Little Hutch are all developed with troughs (Figure 1). They have small associated riparian areas that are fenced off. Shirttail has an

associated 180 foot long channel which is dominated by deergrass. Rosalie has a small water pool and riparian area at the source that is not fenced. Riparian vegetation present at the springs includes deergrass, willow, and Fremont cottonwood.

Adaptive Management

Adaptive management (FSH 2209.13, Ch.90; PR Vol. 2 #4) is a tool that uses documented results of management actions to continually modify management in order to achieve specific objectives. The proposed action is designed to provide sufficient flexibility to adapt management to changing circumstances. If monitoring indicates that desired conditions are not being achieved, adaptive management decisions would be used to modify management. Such changes may include administrative decisions such as the specific number of livestock authorized annually, specific dates for grazing, class of animal or modifications in pasture rotation. Such changes would not exceed the limits for timing, intensity, duration and frequency as defined in the term grazing permit. Adaptive management would be implemented through annual operating instructions, which would adjust livestock numbers and the timing of grazing so that use is consistent with current productivity and is meeting management objectives.

Adaptive management also includes monitoring to determine whether identified structural improvements are necessary or need to be modified. Structural range improvements will be constructed in accordance with 2017 EA and would require to meet Forest Service Standards. Additional input may be required from the interdisciplinary team to determine the best implementation and mitigation practices to follow when constructing new range improvements. Additionally in cases that changing circumstances require further interdisciplinary review, the review could consider the changed circumstances and site-specific environmental effects of the improvements in the context of the overall project. Based on the results of the interdisciplinary review, the District Ranger would determine whether correction, supplementation or revision of the EA is necessary in accordance with Forest Service Handbook Direction at FSH 1909.15(18) and FSH 2209.13(96.1) or whether further analysis under NEPA is required.

Figure 1: Copper Creek Allotment

