

ENVIRONMENTAL ASSESSMENT # AZ-024-95-60

HORSESHOE/COPPER CREEK ALLOTMENTS COORDINATED RESOURCE MANAGEMENT PLAN
IN YAVAPAI COUNTY, ARIZONA, JULY 1997

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EXECUTIVE SUMMARY

The Horseshoe Allotment on BLM-administered public lands and the Copper Creek Allotment on National Forest lands are adjacent allotments comprising nearly 65,000 acres of the Agua Fria Grassland 50 miles north of Phoenix. A portion of the Agua Fria River and headwaters of some of its tributaries flow through this area.

This environmental assessment was conducted as a joint effort between the Phoenix Field Office of the Bureau of Land Management and the Cave Creek Ranger District of the Tonto National Forest. It evaluates a proposed change in grazing management that involves combining pastures on both agencies' allotments into one coherent management system. Grazing on pastures with sensitive riparian areas will be restricted to use during winter months (November through February); tobosa grass pastures will be utilized more frequently after summer rains when the grasses are in their active growing cycle. A base herd of 450 adult cattle will provide stability to the ranching operation, while stocking with varying numbers of calves will permit the range to be fully utilized in good years. The flexible stocking rate will also be reflective of pasture rest periods necessary prior to and following prescribed burns. A very intensive pasture rest-rotation system will be followed, which limits use in each pasture to periods from 2 weeks to 3½ months. Range developments necessary to implement this change in management are evaluated.

In addition, this proposal includes other actions: Construction of wildlife water catchments, chemical renovation of a stock tank to eradicate exotic fish, reintroduction of native fish, modification of existing range fences to facilitate pronghorn movement, partial fencing of 3 stock tanks to provide emergent vegetative cover for waterfowl, creation of a riparian enclosure on Bishop Creek, maintenance of a vehicle barrier on the Agua Fria River, and work on the road system to reduce erosion problems. The wildlife habitat related actions on BLM-administered lands are taken from the existing Black Canyon Habitat Management Plan, 1993, and would be implemented regardless of which alternative is chosen.

Alternatives to the proposed action that were evaluated were: continuation of current grazing management and no grazing.

Public involvement consisted of 2 public meetings: one at the beginning of the planning phase to identify initial issues, and another after a draft of the proposal had been written to solicit comments on the evaluation and alternatives. The list of Agua Fria Coalition members was used as a base of interested parties, and notices of meetings were placed in the local newspaper. The project was listed in the Tonto National Forest's Schedule of Proposed Actions, mailed quarterly to a large list of interested publics. Written comments have been accepted throughout the process. A process record for all documentation and comments is presented in Appendix H.

Issues developed through public involvement and with agency interdisciplinary teams were: maintenance of habitat for sensitive species, planning on a large scale, water quality, watershed condition, riparian health, retaining natural fire frequency in the grassland, impedance of pronghorn movements by fences and brush invasion, retaining native fish populations, cost-effectiveness of any range developments, livestock/pronghorn compatibility, monitoring, air quality during prescribed burns, stocking rates, impacts of the public on archeological sites, safety hazards associated with old mines, excessive erosion caused by poorly engineered roads and BLM Areas of Critical Environmental Concern.

I. INTRODUCTION

A. LOCATION

The Horseshoe and Copper Creek Allotments are located in southeast Yavapai County, Arizona. The Horseshoe Allotment, on BLM lands, encompasses 29,851 acres; the Copper Creek Allotment, administered by the Forest Service, covers 34,944 acres, for a total of 64,995 acres. One permittee, CTW Cattle Company, is authorized to graze both allotments. CTW Cattle Company headquarters are located in Township 10 North, Range 3 East Section 8, in the Horseshoe Allotment. The allotments lie approximately 50 miles north of Phoenix. These lands range in elevation from 3100 feet along the Agua Fria river to 5800 feet at the northeast end of the Copper Creek Allotment. They are situated at the southwestern edge of an ecosystem known as the Agua Fria Grassland.

B. PURPOSE AND NEED

This document will assess the construction of range improvements and implementation of a coordinated resource management plan for the Horseshoe and Copper Creek Allotments.

There is currently no coordinated resource management plan in the area of the Horseshoe and Copper Creek Allotments. No livestock management plan has been analyzed for the Horseshoe Allotment, and the Allotment Management Plan for the Copper Creek Allotment is in need of updating. The existing plan was first implemented in 1982. BLM lands on the Horseshoe Allotment with riparian areas are not provided adequate rest from livestock grazing due to lack of sufficient pastures. Riparian areas on the Forest allotment are generally in fair to good condition, since cattle are removed from the National Forest by May 15 of each year. Uplands in the Perry Mesa area on the Copper Creek Allotment are grazed prior to summer monsoons, when cool season perennial grasses and forbs are grazed instead of the dominant grass, tobosa. Uplands on both the Horseshoe and Copper Creek Allotments are in need of regular rest periods, but there are not currently sufficient pastures to provide for this. Both BLM and Forest Service use prescribed burns to maintain the grassland. A Decision Memo (1993) documented analysis of effects of the prescribed burning program on the Tonto National Forest's portion of the Agua Fria Grassland. Coordination between the agencies and inclusion of grazing schedules will help long-term planning for improved watershed condition.

The Agua Fria River riparian community is becoming degraded by unauthorized OHV use in the channel and floodplain. Poorly engineered roads are contributing to accelerated erosion on the watershed.

There are opportunities to reintroduce native fish in areas isolated from non-native fish species that will retain these new populations. Some range fences are currently inhibiting movements of pronghorn. There is an opportunity to provide water for pronghorn in areas where they are not likely to be ambushed by predators.

In this area of such rich cultural remains, there are great opportunities to inform and educate the public while protecting the cultural resource.

This environmental assessment evaluates proposed actions that will bring the above existing conditions into line with desired conditions as established for the Agua Fria Grassland.

C. DECISION TO BE MADE

Decision-making on public lands is a two-tiered process. Land and Resource Management Plans discuss management activities on a general basis. Project-level decisions are evaluated in more detail,

with additional public involvement, and documented by Environmental Assessments.

The use of public lands for the proposed action is in conformance with the Phoenix Resource Area Resource Management Plan approved December 1988 and the Tonto National Forest Land Management Plan approved 1985. The Eastern Arizona Grazing Environmental Impact Statement (1987) states that all range improvement proposals will be evaluated in an environmental study of appropriate scope to determine site-specific impacts. That Plan does not identify the Horseshoe Allotment for needing a change in permitted livestock numbers. The Eastern Arizona Grazing EIS further states that current stocking levels would remain intact, and any further adjustments would be based on monitoring studies.

The Tonto Land and Resource Management Plan states that lands in this management area are suitable as rangelands, and will be managed according to Management Level D: Management seeks to optimize production and utilization of forage allocated for livestock use consistent with maintaining the environment and providing for multiple use of the range.

The prescribed burn actions and wildlife habitat related actions on the BLM administered lands are taken from the Revised Black Canyon Habitat Management Plan (BLM 1993) and the Agua Fria Grasslands Prescribed Burn Plan (BLM 1994). These plans are current and the actions therein will be implemented regardless of which alternative in this CRMP is adopted.

A decision will be made jointly by the Cave Creek District Ranger and the Phoenix Field Office Manager whether to implement a series of actions described in Section VI.A. (Proposed Action Alternative); continue with current livestock, recreation, and wildlife management (No Change Alternative); or discontinue grazing (No Grazing Alternative).

II. EXISTING ENVIRONMENT

A. AIR QUALITY

The air quality in the area is generally good. Smoke from prescribed burns and wildfires occasionally affects air quality in the area, but these effects are temporary as the smoke is rapidly dispersed due to local winds.

Wilderness areas are designated Class 1 Air Sheds. The goal of air management in the Pine Mountain, Cedar Bench, and Mazatzal Wilderness Areas is not to contribute to degradation of visibility and air quality.

The Verde Valley and Payson areas to the north and east are communities that could be sensitive to changes in air quality caused by wildfire or prescribed burning.

In November 1996, the Camp Verde Yavapai-Apache Indian Community in the Verde Valley was designated a Class 1 Air Shed.

B. WATER QUALITY

Water quality standards for the Agua Fria River, Indian Creek, Silver Creek, and Lousy Canyon are intended to protect the designated uses of A&Ww (aquatic and wildlife, warm water fishery), FBC (full body contact recreation), DWS (domestic water supply), AgI (agricultural irrigation), AgL (agricultural livestock watering). Water quality in the tributaries is protected by the standards that have been established for the nearest downstream water.

The Arizona Department of Environmental Quality (ADEQ) evaluates the water quality status of waters within the state each year in a nonpoint source assessment report. The Agua Fria River, from Big Bug Creek to Squaw Creek, was evaluated by ADEQ using biocriteria in 1992. The report indicates full support of the designated uses. Indian Creek is in partial support of A&Ww, FBC, DWS, AgI, AgL due to an exceedence in the fecal coliform standard. Lousy Canyon is in partial support of FBC due to an exceedence of the fecal coliform standard. The probable cause for both exceedences is open range grazing. Silver Creek is in full support of its designated uses. These three creeks were tested by the BLM in 1993 (ADEQ 1994).

Stream turbidity is increased with unauthorized off-highway-vehicle use in the floodplain of the Agua Fria River.

C. RIPARIAN AREA AND STREAM CHANNEL CONDITION

The allotments are mostly Semidesert Grassland with some Interior Chaparral along canyon slopes and hillsides above 4000 feet. Mixed Broadleaf and Cottonwood-Willow Riparian Forests occur along the stream bottoms. The Agua Fria River and its tributaries, within the allotment boundaries, contain 18 miles of riparian habitat on BLM administered land and 29.1 miles on National Forest lands. The BLM lands have 6.6 miles of riparian habitat which are in "Proper Functioning" Condition (PFC) and 11.4 miles of which are classified as "Functioning at Risk" using the BLM riparian proper functioning condition assessment (U.S.D.I. 1993). The condition of 6.5 miles of key riparian areas on National Forest lands was also assessed by the PFC method. About 1/3 of the reaches assessed (2.0 miles) are in "Proper Functioning Condition"; 4.5 miles are "Functioning at Risk". Key reasons for "at Risk" classification are vegetative and streambank conditions.

From north to south, Silver Creek, Bishop Creek and Copper Creek are the major tributaries on the Agua Fria River in the Copper Creek Allotment. Stream channels and riparian vegetation in the Copper Creek Allotment have probably been altered by grazing and possibly climatic changes (USGS n.d.). It is difficult to separate changes caused by early 1900's grazing and more recent grazing. Some of these changes are unlikely to be reversed, like downcutting and loss of floodplains, channel braiding and introduction of exotics like Bermuda grass and clover. Some changes, such as widening of streams, degradation of streambanks and overuse of streambank vegetation are being perpetuated by the current grazing management in some areas. However, many areas are in good condition and appear to be improving (Johnson and Mason 1997). This may be attributable to a long history of sheep grazing, which is often less impactful than cattle grazing. It may be attributable to winter/spring grazing by cattle since 1948. The high levels of use observed on the allotment in 1996 may have been in response to the drought and some unauthorized use that occurred after May.

The two features of riparian areas in the Copper Creek Allotment that have been most affected by livestock grazing are streambanks and the herbaceous vegetation along them (Johnson and Mason 1997). Stable streambanks maintain stream channel shape and function. Changes associated with loss of streambank stability include wider and shallower streams, reduced ability to transport sediment, loss of undercut banks, and increased erosion. Cattle can physically impact streambanks by trampling and hoof shear. Cattle can also impact streambanks by altering the vegetation that occurs on them. Vegetation plays a key role in maintaining streambank stability, trapping sediment, and dissipating the energy of flood flows. Direct effects of livestock grazing on vegetation include removal of herbaceous vegetation and browsing on woody species. Physical damage to plants can also occur. As a result, shifts can occur in species composition. Vigor can decrease. Over-utilization of young woody species by livestock can reduce recruitment and change age class distributions. As vegetation diversity, cover and vigor are decreased, the ability of riparian areas to function is reduced.

Unauthorized vehicle use in the Agua Fria River directly damages streambanks and riparian vegetation.

D. VEGETATION/WATERSHED CONDITION, SOILS & GEOLOGY

The Semidesert Grasslands within the area are characterized by tobosa/curly mesquite stands on the heavier soils with significant amounts of snakeweed, mesquite, catclaw, prickly pear and juniper invasion in places, due to past fire suppression and livestock grazing. Red brome, an exotic annual grass is abundant throughout the grassland. Native grasses represented in the grassland include but are not limited to tobosa, vine mesquite, side oats grama, curly mesquite, June grass, black grama, hairy grama and threeawn species.

The Interior Chaparral vegetative community is primarily turbinella oak with skunk bush sumac, canotia, mormontea, algerita, and desert ceanothus. Juniper is codominant in some places within the chaparral community.

The Copper Creek and Horseshoe Allotments are located in the Transition Zone, or Central Highlands Province of Central Arizona. Typical of complex geology of the Central Highlands Province (Arizona Highways Dept. 1972), the Agua Fria Grasslands occur on several geologic rock types. Much of the Agua Fria Grassland occur on a broad basalt-covered tableland that includes Perry Mesa, Hutch Mesa, and Rugged Mesa. These Quaternary and Tertiary age basalts overlie Precambrian granitics. East of these mesas, the tablelands drop off into the Bloody Basin and the Verde River. Basalts are exposed at the high eastern end of the tableland, also the hydrologic divide between the Agua Fria and Verde Rivers. Turret Peak and Rugged Mesa are located in basalt. Erosion of overlying basalts has exposed a 2-4 mile wide belt of Precambrian granitics that trends north-south through the northern pastures of the Copper Creek Allotment. This belt of granitics separates the upper elevation basalts from a broad band of basaltic rock that extends east of the FS/BLM boundary west to Black Mesa and Interstate 17. Most of the northern portion of the Copper Creek Allotment occurs on these granitics.

Most of the soils on the Copper Creek Allotment show signs of impacts from past use. A high percentage of soils on flatter slopes show signs of impaired or unsatisfactory soil conditions because of heavy livestock use in the past. There is evidence that sheet and rill erosion have occurred as shown by pedestaled plants. Soils with hard, platy surface horizons show that soils have been compacted by heavy use. In addition, the plant species composition is poor and the vegetative ground cover is low in these flatter sites. There are, however, many flatter slopes where the soil condition is satisfactory, especially areas with dense stands of tobosa grass and areas of thick interior chaparral.

Most of the soils on the moderately steep slopes (15-40%) appear to be satisfactory since they haven't received as much use as the flatter slopes. Most soils on slopes steeper than about 40% are not well suited to grazing and should receive only limited use. They have a high risk of erosion if they are disturbed.

The soils on the Horseshoe Allotment are derived from two different parent materials, granite on the east and west sides and volcanic outflows through the middle of the allotment. Sites developing from the granitic parent material include Granitic Loam Hills, Loam Upland, Loam Hills, and Loam Bottom. Sites developed from the Volcanic parent material include Clay Loam Hills, Clay Upland, Rock Outcrop, and Caliche Upland.

The soils on the BLM lands are described in the Soil Survey of Yavapai County, Western Part (1976), and the Forest lands are described in the Tonto National Forest Terrestrial Ecosystem Survey (1993).

E. WILDLIFE HABITAT AND SPECIES DIVERSITY

The wildlife present is diverse and reflects the variation in vegetative communities and associations represented. Wildlife species present in this area include but are not limited to pronghorn, mule deer,

white-tailed deer, mountain lion, black bear, coyote, raccoon, various rodents, various bats, golden eagle, common black hawk, zone-tailed hawk, red-tailed hawk, turkey vulture, Gambel's quail, various neotropical migratory birds, western diamondback rattlesnake, speckled rattlesnake, gopher snake, black-necked garter snake, collared lizard, desert spiny lizard, lowland leopard frog, canyon tree frog, bullfrog, green sunfish, fathead minnow, mosquitofish, longfin dace, Gila chub and desert sucker.

Game Management Unit (GMU) 21 encompasses a variety of habitat types from the Verde River west to the Agua Fria River. There is a single pronghorn herd in the area of GMU 21 that inhabits the Agua Fria Grassland between Forest Road (FR) 677 and FR 14 and the Agua Fria River. There are 3 distinct pronghorn movement corridors: one on the west side that runs from east of Cordes Junction to Black Mesa, along I-17; one that begins at Marlow Mesa and runs to a flat east of Horseshoe Ranch; and one between these two that also has its southern end east of Horseshoe Ranch. The Horseshoe and Copper Creek Allotments are at the southern terminus of all 3 of these movement corridors. The population of this herd is described as secure, although some movement corridors are threatened by shrub and tree encroachment and human development. Loss of movement corridors could fragment GMU 21 pronghorn into northern and southern herds (Ockenfels et al. 1994). This population has become isolated from other populations of pronghorn because of human-made barriers, such as settlements and freeways. More isolated populations are susceptible to effects of weather, continual habitat loss, poaching, and over-harvesting.

A small elk herd is becoming established in the vicinity of the head of Bishop Creek. This and two other small herds to the north and east, in the Pine Mountain Wilderness, comprise approximately 60 animals at this time. Arizona Game and Fish Department plans to monitor this population and maintain it at a low level by issuing hunting permits (Kyle Cooper, AGFD, pers. comm.).

Surveys for southwestern willow flycatchers were conducted on the Horseshoe Allotment along the Agua Fria River and Silver Creek during June of 1993. Surveys were conducted in the vicinity of the Horseshoe and Copper Creek Allotments along Indian Creek, Lousy Canyon, Sycamore Creek, Dry Creek, Little Ash Creek and the Agua Fria River up and down stream of the ranch headquarters. No flycatchers were located and the habitat was determined to lack the potential to provide suitable habitat for the species. The habitat lacks the potential for floodplain development necessary for suitable habitat and is confined by canyon walls with a steep gradient making it subject to frequent scouring floods. No suitable or potential habitat for this species exists on either the Copper Creek or Horseshoe Allotments.

Arizona Agave is known to occur in the New River Mountains on the Tonto National Forest southeast of the Horseshoe Allotment. Surveys conducted during 1993 did not find this species within the boundaries of the Copper Creek Allotment.

Bald eagles and peregrine falcons are occasionally seen in the vicinity of the Horseshoe Allotment during migration. They likely forage in the area but are not known to nest within the boundaries of either allotment. Suitable nesting habitat does not exist on either Horseshoe or Copper Creek Allotments.

No federally listed threatened or endangered species are known to occur on either the Horseshoe or Copper Creek Allotments.

A list of special status plant and wildlife species that occur, potentially occur or occur in the vicinity of the Horseshoe and Copper Creek Allotment boundaries is presented in Appendix A.

F. LIVESTOCK GRAZING

Livestock have been grazing the Horseshoe Allotment (BLM) since the 1880's. Until recently, BLM lands west of the National Forest boundary in this area were administered by the Arizona State Land Department. The Horseshoe Ranch is authorized to graze 381 cattle annually on the BLM-administered Horseshoe Allotment, for a total of 4572 AUM's. If additional ephemeral feed is available, additional cattle can be authorized on a supplemental permit on BLM lands. The current grazing program utilizes the "next best pasture" concept of grazing rotation. The BLM Range Conservationist and grazing lessee meet annually to coordinate livestock movements for the year, with the requirements that the riparian pastures will not be grazed between March 1 and October 31.

The Copper Creek Allotment, was used as a winter sheep range until 1948. That year the permit was converted to winter/spring seasonal use by cattle, as it remains to the present day. The Forest Service authorizes grazing by 750 adult cattle for 6 months, or 1350 calves, or any combination that results in 4500 AUM's from November 15 to May 15. The grazing system is best referred to as a deferred seasonal rotation. Cattle are first moved into the North Pasture (Granite and Mesa Butte Pastures) in the fall. Full permitted numbers are reached sometime in December. On January 1, cattle are moved into the remaining four pastures in varying degrees. Cornstalk and Bobcat Pastures receive limited use. By mid-March, Brooklyn Pasture has the bulk of cattle. In mid-April cattle are moved to the Perry Mesa Pasture to finish out the season. Length of use in the North Pasture varies each season depending upon water availability and time that cattle come on. Entrance dates or time to full stocking may be delayed as late as January. This grazing schedule is shown in chart form in Appendix B.

A portion of both BLM and Forest Service allotments were part of a sheep driveway from the area of present day north Phoenix to the Coconino National Forest. The driveway was used to trail bands of sheep to the high country every spring and back to the desert in the fall. The area was also being grazed by cattle at the same time. This resulted in higher grazing levels than are currently authorized. The Tangle Creek Sheep Driveway has not been used for several years.

G. RECREATION

While there are no developed recreation sites within the boundaries of the Copper Creek or Horseshoe Allotments, the area is currently used by the public for a variety of cool-season dispersed recreation uses. During the Fall and Winter months small hunting camps dot the landscape. Many such camps may be found along the Bloody Basin Road (FR 269). These encampments last only a few days and usually leave few lasting impacts. There are several locations, however, that are reused frequently by camper and hunters. Generally, these are relatively flat areas near water or trees that are easily accessed from the Bloody Basin Road.

Probably the most heavily used area is along FR 44 (on the east side of the allotment and to the north of FR 269). This area, characterized by hackberry, oak and juniper, is a favorite spot for campers - whether recreating or hunting. The northern portion of this road and several other roads along Bishop Creek provide good access to a favored camping area in white oak and pine, where elk are occasionally seen.

During hunting season the area around Piedmont Well (T. 10 N., R. 4 E., section 33) is often used for camps. Campers often select the level areas provided by old drill/well pads. FR 481 along Hackberry Wash (particularly as it approaches Rosalie Spring, T. 9 ½ N., R. 4 E., section 28) is also heavily used during hunting season, as is the area near Brooklyn Well and FR 14 (T. 9 ½ N., R. 4 E., section 31). With the exception of the area around the junction of FR 599 and 610 (T. 9 ½ N., R. 3 E., section 36) on Perry Mesa, the mesa area is much less heavily used by hunters and campers.

Since the advent of the automobile, sightseeing and off-highway driving have always been the major outdoor recreation activity in the United States. In this area, the Bloody Basin Road (FR 269), an exit on Interstate-17, serves as a portion of a major day-trip travel loop through the Cave Creek Ranger District. Sightseers may drive through the allotment on their way to FR 24 which will take them south to Carefree and Cave Creek. Recently, FRs 269 and 677 have been designated as part of the Great Western Trail - an Off-Highway Vehicle travelway that will be promoted as a route from Mexico to Canada. Informational signs and interpretive kiosks will be placed strategically along the route to guide OHV enthusiasts along the trail.

Recently, the Horseshoe Ranch has applied for a permit to conduct a commercial recreation venture on Federally-managed land. They plan to have paying guests accompany ranch employees as they ride the range and carry out their ranch duties.

H. CULTURAL RESOURCES

Both Copper Creek and Horseshoe Allotments are rich with prehistoric remains. The Perry Mesa area contains one of the largest complexes of late prehistoric sites in central Arizona. The mesa was occupied primarily during the fourteenth century (1300 - 1400 AD) by a population that built masonry pueblos, several with 100 or more rooms. (b) (3) (B)

(b) (3) (B)
(b) (3) (B) An expansion of the Perry Mesa Archaeological District has been nominated to the National Register of Historic Places (Register) (Ahlstrom and Roberts 1994). The historic Copper Creek Cabin, also listed on the Register, is located (b) (3) (B)

(b) (3) (B)

Prehistoric resources are generally in good condition, with the exception of some that have been vandalized. All of the larger masonry ruins have been pothunted to some extent. The prehistoric landscape is intact.

Perry Mesa is becoming well-known as an area of outstanding archaeological sites. Visitation at these sites will probably never be exceedingly high due to difficulty of access. However, artifact collection and pot-hunting are a problem.

I. WILD AND SCENIC RIVER

The Agua Fria River, which bisects the Horseshoe Allotment, has been determined eligible and suitable for designation into the National Wild and Scenic Rivers System. The two segments are from Sycamore Creek to the juncture with Bloody Basin Road at the Horseshoe Ranch and from the Horseshoe Ranch to Larry Creek, totaling 22.4 river miles. The northern segment was recommended for designation as scenic and the southern segment as wild. Approximately 8.3 miles of this total is on the Horseshoe Allotment. The Agua Fria River was addressed in the Final Arizona Statewide Wild and Scenic Rivers Legislative Environmental Impact Statement (USDI BLM 1994) and was recommended for designation.

J. ACEC'S

The Perry Mesa Area of Critical Environmental Concern was established (BLM 1988) to protect the prehistoric sites, which have been subjected to illegal excavation and artifact collecting.

The Larry Canyon ACEC was established (BLM 1988) because of the pristine riparian area in the canyon which has not been impacted by management activities and serves as a relict area for riparian habitats.

K. MINERAL EXTRACTION

Mining operations have been present in the area for some time. The Rosalie Mine was patented under authority of the 1872 Mining Law in 1908 and includes approximately 190 acres. A two-story wood home burned down a few years ago. The foundation and chimney are all that remain. There are several out-buildings and numerous adits and test excavations within the private land boundary. No mining activity has occurred for some time. The area is currently being considered for exchange to the Forest Service.

While several old abandoned prospects are located in the northern portions of the allotment, the only current mineral claims within the National Forest allotment are in the area between Piedmont Well and Copper Creek Cabin. The claims are active at the assessment level of development. One operator is currently working under an approved Plan of Operation. The other is in negotiation for renewal and approval. One of the difficulties, particularly in the Piedmont Well area has been lack of reclamation of drill sites, access roads and old test pits. The Forest is actively working with the operator in this area to close out those areas that are no longer needed.

III. DESIRED CONDITION

The desired future condition for the Agua Fria Grassland Ecosystem in general is presented in Appendix D.

A. AIR QUALITY

Air quality in Class I Air Sheds is maintained or improved. Prescribed burning activities are controlled to minimize visibility reduction and adverse smoke effects on not only Class I Air Sheds, but public facilities and private lands in communities to the north, west and east of the project area.

B. WATER QUALITY

Continue to meet state water quality standards as set by the Arizona Department of Environmental Quality. Meet ADEQ standards for Indian Creek and Lousy Canyon by reducing fecal coliform to acceptable levels. The transportation system is designed and maintained to prevent excessive sedimentation of streams.

C. RIPARIAN AREA AND STREAM CHANNEL CONDITION

Overall goals are to attain proper functioning condition (USDI 1993). There are four components of the riparian and stream channel system to address for desired condition: tree and shrub vegetation, herbaceous vegetation, streambanks and channels.

Tree and shrub vegetation. Maintain the current age class distribution with ample component of seedlings and sapling.

Herbaceous vegetation. Increase the native species diversity, cover and vigor in areas where it has been reduced.

Streambanks. Decrease the erodability of the streambanks by increasing vegetative cover and decreasing hoof impacts.

Stream channels. Increase channel stability by decreasing width, increasing depth and building floodplains.

D. VEGETATION/WATERSHED CONDITION

- Improve the density and composition of grasses especially cool season grasses.
- Increase vegetative groundcover (plant basal area plus litter) with a goal of approaching natural groundcover conditions.
- Improve compacted and impaired soils.

E. WILDLIFE HABITAT AND SPECIES DIVERSITY

Wildlife habitat on the Horseshoe and Copper Creek Allotments is diverse and capable of sustaining a wide variety of species at viable population levels.

A wildlife habitat inventory has been completed for the allotment, which identifies suitable and potential habitat for threatened, endangered and sensitive species, and identifies management strategies for each habitat type present. Suitable habitat for species of special concern is improving and maintaining an upward trend.

Pronghorn antelope populations on the Agua Fria Grassland are reproducing and maintaining a viable herd. Prescribed and natural fires are maintaining a mosaic of vegetation and reduced brush densities in pronghorn fawning areas. Barriers to pronghorn movement have been removed. Water sources are provided at intervals of one mile. Natural water sources are maintained in Proper Functioning Condition to prolong water availability in intermittent or seasonal reaches. Constructed or developed waters are available to pronghorn throughout the entire year. Vegetative cover is maintained at a height of 1 foot or less (Ockenfels et al 1994).

Habitat for riparian-obligate species has improved and provides a multi-storied canopy with well-developed herbaceous understory. Riparian tree snag densities are adequate to provide habitat for cavity-nesting birds, and roost and den sites for other species. Species diversity within riparian areas has increased as vegetative conditions have improved.

Native fish populations are thriving in areas where they are naturally secure from effects of non-native fish.

F. LIVESTOCK GRAZING

A viable livestock operation combines both allotments for advantages of flexibility in grazing patterns and stocking levels. Flexibility in numbers of calves will provide rest needed in drought years or after prescribed burns, without disrupting continuity needed to develop a quality adult cow herd.

A fairly high intensity livestock operation is desired, and feasible, due to permittee's other business as a working guest ranch.

G. RECREATION

Continue to provide a quality recreational experience for the public in the form of dispersed camping, hunting, and sightseeing. The Great Western Trail has provided the opportunity to provide the public with interpretation of unique cultural and natural resources. Some of the more heavily used camping sites are developed.

The permittee will be under permit to operate their commercial business on Federally managed lands.

H. CULTURAL RESOURCES

Extensive cultural resources on both allotments are actively protected by both agencies and the public to preserve their scientific, educational, and heritage values. Some of the larger masonry ruins that are well known have been selected for stabilization, rehabilitation, scientific research, and/or interpretation projects.

I. WILD AND SCENIC RIVERS

Grazing, recreation, and other uses along the Agua Fria River are managed to protect its outstanding scenic, cultural resource, and wildlife habitat values. Measures such as native fish introductions are undertaken to enhance natural resource values. The Agua Fria River Canyon is maintained in wild status with no new roads allowed.

J. ACEC'S

The Perry Mesa ACEC, Perry Mesa National Register District and the Larry Canyon ACEC are managed to protect significant cultural, historic and natural resources.

K. MINERAL EXTRACTION

All operations will continue to be carried out under approved Plans of Operation that emphasize minimum damage to surface resources and quality reclamation in a timely manner. Old abandoned mines will be reclaimed as funding and opportunity allow.

IV. ISSUES

Initially, a list of issues, concerns and opportunities was developed by the ID Team in a Project Feasibility Report approved in October 1993. They were:

- Opportunity to improve forage availability, production, & nutritional value for wildlife and livestock
- Opportunity for various agencies to work cooperatively for ecosystem benefits
- Opportunity to plan on a large scale
- Concern with possibility of increasing summer use on National Forest lands
- Concern for maintaining habitat requirements for sensitive species
- Common methods needed for both federal agencies to be able to work together.
- Water quality in streams, especially as related to native fish populations.
- Brush encroachment into grassland is converting the habitat type to one that is not desired, and one that is not conducive to pronghorn survival
- Watershed condition
- Ability to provide for a viable ranching operation, consistent with other uses.
- Riparian health of the Agua Fria River and its tributaries.

A meeting of the Agua Fria Grassland Coalition (open to the public) on January 15, 1994 discussed issues common to the entire grassland. In addition to some of the issues developed by the ID Team for the Horseshoe/Copper Creek Project, some other issues were raised. They were:

- Retaining natural fire frequency in the grassland
- Range fences impede pronghorn movements
- Possibility of reintroduction of extirpated species.

At a public meeting on April 8, 1994, the Horseshoe/Copper Creek Coordinated Resource Management proposal was presented. In addition to many of the issues listed above, the following were discussed:

- Impacts of the public on archeological sites.
- What would be the future need for predator control by the State agency Animal Damage Control, and would the public be involved in any decision to use this agency.
- Air quality
- Safety hazards associated with mines. Also visual quality of some mining operations in the area. Mine pits may be habitat for bats.
- Transportation system -- maintain roads to control runoff. Control off-road driving.
- Recreation - public education needed, especially regarding off-road driving.
- Economics - cost-effectiveness of any development to better manage livestock.
- Livestock management - need tight pastures, more waters, logical timing of pasture moves.
- Manage the ecosystem as a whole.
- Evaluate stocking rates.

The last public meeting was held on April 20, 1996 to present the revised proposal and environmental analysis. Documentation of this meeting is presented in Appendix F. The group was satisfied with issue development and analysis of effects, and added several more issues:

- Is winter grazing in riparian really compatible with healthy riparian communities?
- What about livestock management in riparian during drought?
- Livestock/pronghorn compatibility
- Do we want to create an artificial situation by developing additional waters for pronghorn?
- Why don't the FS and BLM monitor a large variety of sensitive species to monitor success of the project?

Finally, the ID Team raised 2 more issues that must be legally addressed:

- Wild and Scenic Rivers
- Areas of Critical Environmental Concern (Abbreviated "ACEC's" for the remainder of this document -- for definition, see Glossary, Appendix E)

These issues are discussed below by general category.

A. AIR QUALITY

Class 1 Air Sheds in the vicinity of the Copper Creek and Horseshoe Allotments are Pine Mountain Wilderness, Cedar Bench Wilderness, Mazatzal Wilderness, Camp Verde Yavapai Apache Indian Community.

Air quality-related values (see definition in Glossary, Appendix E) should be protected in Wilderness Areas. Air quality in Class I Air Sheds should be maintained or improved.

Smoke from prescribed burns may impact local communities.

B. WATER QUALITY

Roads, and especially road crossings, are a source of sediment to the streams. Livestock use in creeks may be damaging to water quality.

C. RIPARIAN AREA AND STREAM CHANNEL CONDITION

Riparian areas on both allotments are important habitat for 3 native fish species, lowland leopard frogs,

Mexican garter snakes, and various neotropical migratory birds. The restoration and maintenance of riparian habitat in proper functioning condition is important for biodiversity and the health of the ecosystem as a whole. On the Copper Creek Allotment, generally, the species and age-class diversity of the tree and shrub component of the riparian vegetation appears to be adequate to maintain riparian area condition and function. To reach desired condition, improvement is most needed in the herbaceous component. Livestock use has reduced herbaceous vegetative cover and altered streambanks and channels in some stream reaches in the Copper Creek Allotment. As a result, riparian areas are less able to dissipate energy from high water flows, limit erosion, improve water quality, filter sediment, store water and provide wildlife and fish habitat.

D. VEGETATION/WATERSHED CONDITION

The grassland vegetation type is subject to shrub and juniper invasion in places due to past fire suppression and livestock grazing. The natural role of fire in the grassland ecosystem has been interrupted in the last hundred years by elimination of fine fuels by domestic livestock and an active program of fire suppression. As a consequence, there are large areas of bare ground. Invader species such as catclaw, juniper, snakeweed and red brome have increased, and soils have been subject to increased compaction, runoff, and erosion. Vegetative groundcover is not adequate to prevent accelerated erosion in some areas. Vehicles have caused localized damage on or adjacent to some system roads, causing gully erosion. Soil compaction has occurred in some areas as a result of heavy livestock concentrations. Although much of the range is in fair condition, there are large areas on the flats that are in poor condition.

If prescribed burns or areas burned by wildfires are not rested adequately following a fire, a site may become more suitable for exotic annual plants, since competition from native perennials will be temporarily reduced.

E. WILDLIFE HABITAT AND SPECIES DIVERSITY

Exotic fish and amphibian species occur in most streams and waters within the allotments. The distribution of native fish, amphibian and reptile species is limited and disjunct and some species have been locally extirpated due to the occurrence of these exotic species as well as riparian habitat degradation.

Wildlife distribution, movement, access to water and recruitment have been impacted by fences and habitat alterations. Preventing loss of existing movement corridors is critical to preventing fragmentation of the pronghorn population in Game Management Unit (GMU) 21. Isolation of pronghorn populations, caused largely by movement barriers that prevent pronghorn herds from interchanging is a critical issue (Ockenfels et al. 1994).

There is no need for any action by Animal Damage Control at this time or in the foreseeable future; therefore, this issue was deemed to be outside the scope of this environmental analysis. If an issue of predator control should arise in the future, it will be addressed in a separate environmental analysis.

F. LIVESTOCK GRAZING

Livestock grazing has contributed to the degradation of riparian and upland habitat condition in some areas. Streambank trampling and overutilization of cottonwood, willow and ash tree seedlings and riparian herbaceous growth is evident along some segments of Copper Creek, Silver Creek, Indian Creek and the Agua Fria River. The current season of use on the Copper Creek Allotment has generally resulted in fair range conditions throughout. There are still some livestock concentration areas in the uplands that are in poor condition. Perennial grass and forb diversity could be improved

by changing season of use on the semidesert grassland portions of the allotment that are dominated by tobosa grass. Since this grass is a warm season grower (it greens up after the summer monsoons), it is fairly unpalatable during its dormant season. It has received very little use under the current system of management. Consequently, other perennial grasses and forbs in the community, such as cool season growers that green up in the winter and spring, receive a disproportionate amount of use.

The permittee is willing to do fairly intensive livestock management. In order for this to be successful, pasture boundaries need to be tight, and there needs to be sufficient dependable water available in each pasture. Pasture moves need to be logically sequenced and timed.

Any funds spent on developing the range for improved management should be cost-effective.

G. RECREATION

Recreation use in the area is dispersed and unstructured. The primary issue with recreational use is the potential impact to natural and cultural resources in the area. Large prehistoric ruins draw commercial "pot-hunters" to the (b) (3) (B) area. Recreational artifact collecting occurs as well as unintentional damage to sites through lack of awareness of the users. Uninformed choice of camping locations can negatively impact riparian areas, wildlife movement and water quality. Off-road driving has damaged vegetation, soils, cultural sites and wildlife habitat areas.

H. CULTURAL RESOURCES

The numbers and the significance of the archaeological resources on the allotments create management issues of conservation and protection of the sites from both intentional and inadvertent damage. Visitor use, cattle operations, fire control and other activities have the potential to negatively impact these resources. Prescribed burns have been demonstrated not to adversely impact prehistoric cultural remains in the Grassland.

Archeological sites and other areas not yet identified may have significance to traditional cultures.

I. WILD AND SCENIC RIVERS

Eligibility determination requires the Bureau of Land Management to manage the river corridor in a way that does not harm the outstanding scenic, fish and wildlife and cultural resource values.

The Agua Fria River was addressed in the Final Arizona Statewide Wild and Scenic Rivers Legislative Environmental Impact Statement (USDI BLM 1994) and was recommended for designation, the northern segment as scenic and the southern segment as wild as shown on maps in Appendix C.

J. ACEC'S

Two ACEC's were designated in the Phoenix RMP/EIS (USDI BLM 1988), Perry Mesa and Larry canyon. These areas must be managed to protect the significant environmental features that lead to their designation. Perry Mesa for the cultural sites and Larry Canyon for its pristine riparian area.

K. MINERAL EXTRACTION

Over the years, many adits and test excavations have been left open. These may pose a risk for the rancher and his employees and for hunters and recreationists. Since many of these areas are no longer claimed (and have not been worked for some time), there may be no private parties who can be held accountable for closing and reclaiming them.

The following resources were considered but will not be impacted by implementing any of the alternatives: prime or unique farm lands, hazardous wastes, noxious weeds, wilderness, and environmental justice.

V. PUBLIC INVOLVEMENT

This project was initiated by a letter from the permittee/lessee to the BLM on February 27, 1993. A project feasibility report, IRM-phase 4 was completed on October 8, 1993 by the Forest Service and the BLM. A public meeting was held on April 8, 1994 to solicit information regarding the Coordinated Resource Management Plan. Nineteen members of the public and agencies attended the meeting. Information gathered at this meeting was used along with existing agency guidelines and plans to develop this proposed plan. On April 20, 1996 a public meeting was held at Copper Creek Administrative Site on the Tonto National Forest, on the Copper Creek Allotment, to inform interested publics of the proposed action and discuss the Environmental Assessment and Coordinated Resource Management Plan. Comments were accepted during the meeting, and in writing until May 3, 1996. All comments and suggestions have been addressed in this plan. The agency response to final comments and questions are presented in Appendix I.

VI. DESCRIPTION OF ALTERNATIVES

A. ALTERNATIVE A - PROPOSED ACTION

CTW Cattle Company, grazing permittee on both the Horseshoe and Copper Creek Allotments, has proposed entering into a Coordinated Resource Management Plan with the Tonto National Forest and the Bureau of Land Management, Phoenix Resource Area. The plan would require several range and wildlife improvement projects and grazing strategies as listed below:

- Combine the two agency units into one management unit with a single cow/calf herd with calves utilizing the rougher portion of the Forest Service lands.
- Coordinate pasture moves with prescribed burning plans for the Agua Fria Grasslands. Pastures to be burned will be rested January through July prior to burning and for one growing season following burning.
- Implement the grazing schedule "Proposed Action" in Appendix B. Additional pasture information is contained in Appendix G.
- Limit livestock grazing in all riparian pastures to winter season of use, November 1 through March 1.
- Set allowable utilization of forage to an average of 40% of current year's growth of key species in key areas.
- Replace 7 gates with cattleguards and install a swinging gate subject to available funding. The cattleguards will replace the gates at the Copper Creek corrals tank, both existing gates into Lousy Pasture on Forest Road (FR) 14, on FR 677 at the fence between Cornstalk and Bobcat Pastures (this will be a new fence), on the road to Perry Mesa Tank (FR 611) between North Brooklyn and Perry Mesa Pastures, at the Forest boundary on FR 481, and on FR 610 1/4 mile south of the junction with FR 14.
- Construct a wildlife water catchment in T. 9 1/2 N., R. 3 E., Sec. 34 by 1998.

- Install a pump at a well drilled in T. 10 N., R. 4 E., Sec. 31, in the vicinity of Hackberry Wash. Groundwater will be pumped to storage tanks and troughs so it will be available to livestock and wildlife.
- Chemically renovate Perry Mesa Tank and the tinaja downstream in Perry Tank Canyon to eradicate mosquitofish by 1998.
- In cooperation with the Arizona Game and Fish Department and U. S. Fish and Wildlife Service, introduce Gila topminnow and desert pupfish into Silver Creek and the tributary to Larry Creek by 2006.
- Improve pronghorn access to New Windmill, Perry Windmill, and Perry Mesa, Silver Creek, Cornstalk and Copper Tanks by modifying existing fence configurations by 2001.
- Modify all boundary and interior pasture fences to pronghorn specifications when they are encountered through 2006.
- Partially fence Perry, South Campbell and Copper Tanks to provide emergent vegetative cover for waterfowl using these areas during migration by 2006.
- Create an enclosure for the lower 2 miles of Bishop Creek on the National Forest by using existing fencing and constructing 2 miles of fence on the ridge south of Bishop Creek.

Other actions to address issues and move toward desired condition are:

- Use prescribed fire throughout the Horseshoe and Copper Creek Allotments on a 5-7 year cycle. Burn blocks range in size from 1200 to 3680 acres. Documentation of environmental analysis for the Agua Fria Grassland Prescribed Burns was approved on May 18, 1994. Both agencies have current Prescribed Burn Plans.
- Continue to issue Special Recreation Permits, with appropriate stipulations, to provide for quality experiences that also protect the natural and cultural resources within the allotments. There are currently permitted Special Uses in the area of the Horseshoe and Copper Creek Allotments. These permitted activities will continue.
- Evaluate all management actions proposed near the Agua Fria River for potential to affect the values contributing to the Wild and Scenic River status as required by law.
- Maintain a barrier to control vehicle access downstream of the Bloody Basin Road in the Agua Fria River.
- Work on road system so that all roads are properly drained and engineered to reduce erosion problems.

B. ALTERNATIVE B - NO CHANGE/CONTINUATION OF CURRENT MANAGEMENT

Under this alternative, no new range improvements would be built and the current separate grazing operations would continue. (See grazing schedule for the Copper Creek Allotment in Appendix B, and description of grazing operations on BLM and FS Allotments in Section II F.) Management actions that would be implemented are:

- Use prescribed fire throughout the Horseshoe and Copper Creek Allotments on a 5-7 year cycle. Burn blocks range in size from 1200 to 3680 acres. Documentation of environmental analysis for the Agua Fria Grassland Prescribed Burns was approved on May 18, 1994. Both agencies have current Prescribed Burn Plans.
- Construct a wildlife water catchment in T. 9 1/2 N., R. 3 E., Sec. 34 by 1998.
- Chemically renovate Perry Mesa Tank and the tinaja downstream in Perry Tank Canyon to eradicate mosquitofish by 1998.
- In cooperation with the Arizona Game and Fish Department and U. S. Fish and Wildlife Service, introduce Gila topminnow and desert pupfish into Silver Creek and the tributary to Larry Creek by 2006.
- Improve pronghorn access to New Windmill, Perry Windmill, and Perry Mesa, Silver Creek, Cornstalk and Copper Tanks by modifying existing fence configurations by 2001.
- Modify all boundary and interior pasture fences to pronghorn specifications when they are encountered through 2006.
- Partially fence Perry, South Campbell and Copper Tanks to provide emergent vegetative cover for waterfowl using these areas during migration by 2006.
- Continue to issue Special Recreation Permits, with appropriate stipulations, to provide for quality experiences that also protect the natural and cultural resources within the allotment. There are currently permitted Special Uses in the area of the Horseshoe and Copper Creek Allotments. These permitted activities will continue.
- Evaluate all management actions proposed near the Agua Fria River for potential to affect the values contributing to the Wild and Scenic River status, as required by law.
- Maintain a barrier to control vehicle access downstream of the Bloody Basin Road in the Agua Fria River.
- Work on road system so that all roads are properly drained and engineered to reduce erosion problems.

C. ALTERNATIVE C - NO GRAZING

Under this alternative, grazing by livestock would be phased out on both BLM and Forest Service allotments. None of the range management actions described in Alternatives A or B would be implemented. The wildlife habitat related actions on the BLM-administered lands would be implemented as they are described and proposed in the Revised Black Canyon Habitat Management Plan and Environmental Assessment (BLM 1993). The prescribed burns on the BLM-administered lands would be allowed as they are authorized in the Agua Fria Grasslands Prescribed Burn Plan (BLM 1994).

Special Use permits would be issued after meeting NEPA requirements on a case-by-case basis.

VII. ENVIRONMENTAL IMPACTS

A. IMPACTS OF THE PROPOSED ACTION ALTERNATIVE

1. DIRECT AND INDIRECT IMPACTS:

Air quality:

Prescribed burning within the allotments may cause temporary visual impairment in the Pine Mountain and Cedar Bench Wilderness areas, and also in the Camp Verde Yavapai-Apache Indian Community in the Verde Valley, which are Class 1 Air Sheds. The Verde Valley and Payson areas could also be affected by burning when winds are from the west or southwest, as they normally are. Burning is normally conducted during summer months, when inversions that would prevent smoke from dispersing vertically are uncommon. These impacts are addressed in the BLM and Tonto National Forest prescribed burn plans for the area.

Water Quality:

While the impact of prescribed burning in the grassland on water quality will be very small, burning chaparral may cause short-term adverse impacts to water quality due to increased sedimentation, especially if steep slopes are burned. The vegetation should become reestablished and erosion rates return to pre-burn condition within three years. Over the long-term, the effects of prescribed fire should be beneficial as the potential for catastrophic wildfires is reduced, and vegetation with more fibrous root structure becomes more dominant.

Improved distribution of cattle should reduce bank impacts from cattle thus reducing bank erosion and sedimentation into the creeks.

Roadwork that improves drainage and minimizes erosion should reduce sedimentation of streams.

Vegetation/Watershed Condition:

Under the proposed management, Perry Mesa Pasture on the National Forest will be grazed less frequently in the spring, and more often after summer monsoons. Livestock will make better use of the dominant tobosa grass when it is actively growing after monsoons have begun (Paulsen and Ares 1962). Cool season grasses should increase in abundance under this system, since most pastures are used for shorter periods of time than they are under prescribed burns at intervals of 5-7 years are recommended by researchers, if the objective is to reduce brush encroachment and perpetuate a grassland aspect (Wright 1972).

The increased vegetative ground cover and reduced compaction will increase infiltration of water into the soil. The increased shade and mulch will reduce soil moisture loss through evaporation. Improved distribution of cattle would allow most compacted soils to improve, although in some heavily used areas improvement could be slow or may not occur at all.

There may be a short-term increase in erosion following prescribed burns. The increased erosion from grassland fires is expected to be very low. The erosion from a chaparral burn on steep slopes, however, could exceed tolerance levels for one to three years until there is a buildup of vegetation and litter. Most slopes in the area addressed by both agencies' Burn Plans are less than 30%.

Wildlife/Threatened or Endangered Species/Species of Special Concern:

Habitat conditions for pronghorn antelope will be improved with implementation of this project. The fence modifications will remove barriers to pronghorn herd movement to escape predators and access waters. Coordinating pasture use and rest cycles with a coordinated burn plan for this large area of the Agua Fria Grassland will remove invading brush and perpetuate the grassland aspect. With a more open aspect, pronghorn survival should improve. Regular post-burn rest for pastures will allow perennial grasses time to seed and grow to provide cover for pronghorn fawns the following year. Regular burning will also make the dominant grass, tobosa, more nutritious and palatable.

Pronghorn habitat improvement projects will also have a positive effect on other species occurring in the area. Construction of a wildlife water catchment and leaving storage tanks full when windmills are turned off will provide water sources for many species of wildlife during the critical summer months when stock ponds are dry and many natural water sources are producing little, if any, surface water.

Partially fencing three large stock ponds, and resting riparian areas along the Agua Fria and its tributaries from March 1 to November 1 will allow for more herbaceous growth along streambanks, increase streambank stability and also increase survival of riparian tree seedlings. This in turn will provide habitat for species of special concern which rely on riparian ecosystems for reproduction, food, cover, and other attributes. These include the Maricopa tiger beetle, Parker's riffle beetle, Gila chub, Gila Sucker, longfin dace, Mexican garter snake, lowland leopard frog, Arizona southwestern toad, Harris' Hawk, common black-hawk, zone-tailed hawk, western yellow-billed cuckoo, and the red bat. As riparian conditions improve, habitat for all species of native fish will improve.

Ponds that are fenced from livestock are often more attractive to reptiles and amphibians because they usually have a better cover of emergent aquatic and riparian plants (Scott 1996).

Many species of reptiles and amphibians depend on either temporary or permanent bodies of water, and most forms that have suffered declines are associated with water or riparian vegetation. For this reason, water provision will often have the greatest immediate effect on local herpetofaunal species richness (Scott 1996).

Placement of native fish in sites that are not now occupied will help to recover those species that are threatened or endangered and prevent those that are not threatened from becoming so. This action underwent consultation with the U. S. Fish and Wildlife Service, biological opinion 2-21-93-F-263, September 8, 1993 and correspondence with the Service dated February 14, 1994.

There will be the potential for several short term effects on wildlife during prescribed burning. Upland species of special concern which may be affected by prescribed burning, should they occur in the area, include chuckwalla, Gila monster, desert tortoise (Copper Creek Allotment), spotted bat, Townsend's big-eared bat, California leaf-nosed bat, southwestern cave bat, Yuma myotis, greater western mastiff bat, ferruginous hawk, Swainson's hawk, Yavapai Arizona pocket mouse, ringtail, Toumey agave and Arizona agave. Impacts to these species may include displacement or death of individual animals during burning, disturbance during preburn preparation and ignition activities, temporary loss of hiding cover for rodents and other small animals within the burn area, disturbance from smoke, increased sediment and nutrient loading in streams and drainages during rainfall events, and abandonment of burrows due to temporary reduction in groundcover which results in increased soil temperatures and exposure of the burrow to predators.

Another possibility that exists that would impact wildlife species in the area, is the risk of prescribed fires escaping and becoming wildfires. This has occurred during previous prescribed fires and the effects may include those addressed in the above paragraphs, with a greater degree of habitat loss due

to scorched soils and loss of groundcover.

Indirect effects of fire on wildlife are long-lasting, and usually more important than direct effects. They can also be very complex. Grassland fires may directly or indirectly cause major or minor population or community structure changes depending upon the effects on migration patterns, life history, and feeding habits of the animal, and the timing, extent and intensity of the fire (Ford and McPherson 1996).

In general, burned areas often support more diverse animal populations than comparable unburned sites due to increased habitat diversity (Beck and Vogl 1972).

Should desert tortoises occur in prescribed burn blocks within the Copper Creek Allotment, according to Cordery et. al. (1993) they may risk increased predation, thermal extremes and decreased shelter availability. They are especially at risk when engaging in activities away from cover, such as feeding and breeding.

Grassland burning elicits a diverse array of responses by arthropods. Research conducted on predator groups of arthropods has shown that most species were able to move out of the path of the fire and recolonize the area quickly (Ford and McPherson 1996). True soil-dwelling microarthropods have been reported to increase in densities in response to frequent grassland fires (Lussenhop 1976).

There are few studies on herpetofaunal responses to burning of grasslands in this country.

Fires rarely kill birds directly, but rather affect population levels indirectly by altering habitat structure, abundance of competing species and food levels (Bock and Bock 1990). Many bird species that inhabit grasslands have been documented to increase habitat use in shrublands or grasslands after fire. Far fewer bird species are reported to be negatively affected by fire. These species are generally closely associated with shrubby habitat, and more abundant in unburned areas (Ford and McPherson 1996). In the mixed-grass prairie, where fire has been used as a habitat management tool since the 1970's, several bird species, including Bairds's sparrow, grasshopper sparrow, LeConte's sparrow, Sprague's pipit, and western meadowlark were the most common and abundant birds; in unburned prairie they were all completely absent (Madden 1995). Fire may have a cleansing effect on bird populations by lowering the numbers of parasites that affect health and vigor in individuals (Kramp et al 1983). Populations of the burrowing owl have reportedly declined on grasslands with increases in litter cover. This suggests that the use of fire to reduce litter cover may be beneficial to this species (Komarek 1969, Kramp et. al. 1983).

Grasslands fires that temporarily remove food and cover may be detrimental to small rodents immediately after fire (Daubenmire 1968), but repopulation of such areas is reported to be nearly complete within 6 months (Cook 1959). Other authors report that it may take four to six years to recover the rodent community to its prefire condition, depending on species composition of the area (Wirtz et. al. 1988).

Most native ungulates, including white-tailed deer, elk, and pronghorn increase in population and habitat use after fire. The response is due to an increase in forage quality and quantity in newly burned areas (Ford and McPherson 1996).

Some bat species, such as California myotis, may benefit from the additional roosts provided by shrubs and other woody plants that would proliferate were the grassland not burned periodically, the more significant impact on the local bat community may be the change of insect fauna from grassland species to desert shrubland or juniper savanna species. Too little is known at this time about diet and prey selection by grassland-dwelling bats to predict their responses to changes in the arthropod community following fire. However, the diversity of arthropod orders found in guano of any one bat

species suggests a degree of dietary plasticity in bats (Scott 1996).

Impacts to threatened and endangered species on the Copper Creek allotment have been addressed separately in a Biological Assessment and Evaluation dated May 1997. This report documents a determination of "no effect" on Arizona agave, Mexican spotted owl and Peregrine falcon; and no impact on 24 Sensitive species that either occur on the allotment or may have suitable habitat on the allotment.

The proposed action will have no effect on southwestern willow flycatcher in the Horseshoe and Copper Creek Allotments because suitable or potential habitat for this species does not exist.

The proposed action will have no effect on bald eagle, peregrine falcon nor any other listed species on the Horseshoe allotment administered by the BLM. The proposed action is not likely to adversely affect any of the species of concern that may occur on the Horseshoe Allotment administered by the BLM.

Riparian Area and Stream Channel Condition:

Boone, North and South River, Bobcat, Granite and Mesa Butte Pastures include the most significant riparian areas, and management is designed specifically with riparian management objectives. Use is scheduled only during the winter months (November through February) during short periods of use (from one to two and one-half months). Bobcat and Granite are rested one year out of five. Mesa Butte is used each of the five years. A two mile long enclosure will be constructed on Bishop Creek. Copper Creek is located in the Cornstalk Pasture. It is an intermittent stream reach, but does support riparian vegetation. Cornstalk Pasture is used from one and one-half to two months four years out of five, between February and May. Boone, North and South River Pastures are used only during winter months. Pasture maps are presented in Appendix C and additional pasture information is presented in Appendix G.

Under the proposed alternative, cattle should spend less time in most of the riparian areas. As a result, there should be an improvement, and therefore a beneficial effect on riparian vegetation, streambank stability and channel morphology in the Boone, North and South River, Bobcat, Mesa Butte and Granite Pastures. Braided channels and downcut channels that have not developed floodplains may be too unstable to allow vegetation to establish and will likely remain unstable. There will continue to be localized areas where cattle concentrate with adverse effects on streambanks. The most impacted areas will be near perennial pools that cattle use to water. Riparian vegetation will likely remain the same on Copper Creek in the Cornstalk Pasture where the proposed alternative does not differ much from the existing grazing schedule. Riparian vegetation diversity, density and vigor should increase in the Bishop Creek enclosure.

The indirect effects associated with other activities described in the proposed action, including prescribed fire, road maintenance and changes in upland grazing strategies may have a long-term, beneficial effect on riparian vegetation and/or stream channel conditions.

Compatibility of winter seasonal livestock grazing and healthy riparian was addressed at length in the letter documenting the 4/20/96 public meeting (see Appendix F).

Livestock Grazing:

The coordinated plan will allow the lessee/permittee to use in a more sustainable manner all the pastures and reduce the grazing on riparian areas within these allotments. The pasture fences will allow better control of the timing and degree of forage utilization by livestock. AUM's that may be grazed are somewhat lower than have been grazed in the past, since stocking by calves will be related

to and coordinated with which pastures are burned. Stocking by calves will also be coordinated to prevent heavy use when drought years occur.

The grazing system is fairly intensive (some moves occur after only 2 weeks in a pasture), and success of the grazing system is dependent upon adherence to the schedule and frequent moves.

Not many range developments are necessary to be able to implement improved livestock management. They are: 2 miles of fence, development of 1 well to replace loss of accessible livestock water in Bishop Creek, and installation of 7 cattleguards.

Cost of these developments is:

Windmill in Cornstalk Pasture		=	\$ 9,000
Cattleguards - materials	2400 ea x 7	=	\$16,800
Cattleguards - labor	2900 ea x 7	=	\$20,300
Bishop Creek fence - materials	1700/mi x 2	=	\$ 3,400
Bishop Creek fence - labor	3000/mi x 2	=	\$ 6,000
Total cost			\$55,500

Typically, 50% of the cost of range developments is borne by the permittee, 50% by the Forest Service, on Forest Service-administered grazing allotments.

Recreation:

No significant impacts on recreation are expected. Visitation to archeological sites with interpretive signs may increase as the public becomes aware of these facilities. In addition, interpretive opportunities along the Great Western Trail may encourage responsible recreation behavior.

Cultural Resource and Native American Religious Concerns:

No cultural resource sites will be impacted by the project. Some Native American tribes have identified the area as "Significant" to their members. There will be increased protection of the values and greater opportunity for public enjoyment and education.

Wild and Scenic Rivers:

No significant impacts are expected on the proposed sections of the Agua Fria river.

ACEC's:

No significant impacts on Larry Canyon and Perry Mesa ACEC's are expected.

Mineral Extraction:

No significant impacts on mineral extraction activities are expected.

2. CUMULATIVE IMPACTS:

Cumulative effects result from the incremental effect of actions when they are added to other past, present, and reasonably foreseeable future actions. This analysis describes the cumulative effects of the proposed action on the Copper Creek and Horseshoe Allotments. There are no other activities such as timber harvest, road construction, or fuel management planned for this area. Recreation

occurs within the analysis area, but effects from this activity are minimal compared to the effect of livestock grazing.

Air Quality:

Air quality in the large area of the Agua Fria Grassland and its associated communities, is generally good. Factors that most affect it are smoke from fire, both wild and prescribed, and burning fuel in fireplaces in the communities. Since prescribed burns called for in this plan will be done during summer months, there should be no cumulative effect from this activity and wood burning in homes in Camp Verde, Payson, Cordes, and other small communities nearby.

Water Quality:

The cumulative effect of proposed activities should be beneficial.

Wildlife/Threatened or Endangered Species/Species of Special Concern:

Overall, improved livestock grazing practices on the Horseshoe Ranch will have a positive effect on wildlife. Improvement of vegetative conditions, both in the uplands and in riparian drainages, will improve habitat for most species of wildlife occurring in the area. The availability of forage, hiding and thermal cover, and habitat for breeding and nesting will increase as range condition improves on the allotment.

Other cumulative impacts may occur with long-term livestock grazing. These include soil compaction and loss of top soil, loss of groundcover, changes in vegetative composition and vigor, and a reduction in litter and organic matter. All of these may cumulatively impact wildlife populations over time.

Changes in soil structure may impact burrowing species and invertebrates. As pore space decreases, soil temperatures rise and soil moisture decreases. Soil-dwelling invertebrates and burrowing species rely on loose soils and high moisture content to survive underground. Changes in vegetation related to livestock grazing generally result in changes in species diversity and population numbers. As grazing management practices are improved, these impacts may be lessened.

Should desert tortoises occur in prescribed burn blocks within the Copper Creek Allotment, according to Cordery et. al. (1993) they may risk increased predation, thermal extremes and decreased shelter availability. They are especially at risk when engaging in activities away from cover, such as feeding and breeding.

Krueper (1993) found that birds that are understory obligates for breeding and/or feeding in riparian zones increased population densities throughout the riparian zone within three years of livestock removal. This change was due to the increased vegetative cover and prey abundance as a result of livestock removal. Limitation of grazing in riparian areas to the winter on the Horseshoe Ranch should have a similar effect.

Winter grazing of riparian areas has been found to have little effect on small mammal populations and their habitats (Samson et al. 1988).

The Agua Fria Grassland evolved under a regime of frequent summer grass fires. Associated native wildlife are adapted to this. Since the current prescribed burn program mimics the natural situation, there will be no long-term adverse cumulative effects of prescribed burns.

Vegetation/Watershed Condition:

There is general agreement that fire is necessary to control the abundance of woody plants and maintain most grasslands. In the absence of periodic fires, grasslands usually give way to dominance by woody plants (McPherson 1995). Summer fires can stimulate seed yields of native grasses more than fires in winter or early spring (Biswell and Lemon 1943).

Problems with soil compaction should decrease with improved groundcover.

Collectively, the management actions described in the proposal, and existing uses of the land, should cause the landscape to continue as a desert grassland, in association with chaparral habitat on slopes and soils derived from granitic parent material.

Riparian Areas and Stream Channel Condition:

The proposed alternative may have a beneficial cumulative effect for most reaches in the Boone, North and South River, Bobcat, Granite and Mesa Butte pastures. There should be no additional adverse cumulative effects on riparian areas in the Copper Creek Pasture. Over time, vegetation and stream conditions would probably improve. Herbaceous vegetation along streams should increase in abundance and cover. Age class structure of the riparian tree canopy should maintain or increase.

The 2-mile section of Bishop Creek that will be fenced from grazing will be an important benchmark site for riparian potential on numerous similar streams throughout the Grassland.

Livestock Grazing:

Grazing operators and agencies are working to find new and creative ways to be able to continue ranching operations on the Agua Fria Grasslands in particular, and the arid southwest in general, in harmony with changing values and increased public scrutiny. This proposal involves combination of lands administered by 2 federal agencies, incorporation of research findings on pronghorn and tobosa management, and use of the permittee's guest ranch business to provide the intensive labor necessary to make the grazing system work. This CRMP will set an example for other ranchers to develop their own unique strategies to protect sensitive riparian areas and watersheds while maintaining viable ranching operations.

Recreation:

The entire Perry Mesa area is becoming well-known as the home of several large and impressive archeological sites. Visitation may be expected to increase, whether these sites are interpreted and protected or not. Various other forms of recreation may be expected to increase, with populations increasing in nearby communities such as Cordes Junction. It will be important to have cattleguards on all fence crossings of system roads -- we have experienced problems with recreationists leaving gates open on other allotments that are closer to urbanized areas.

The Horseshoe and Copper Creek Allotments' permittee operates a guest ranch on both BLM and FS lands, and is currently in the process of obtaining a Special Use Permit for this activity. This type of recreation promotes responsible use of these lands, and serves to educate the public regarding range, wildlife, and the concept of multiple use management.

Cultural Resource and Native American Religious Concerns:

Protection and conservation of important cultural sites on the Grassland will be enhanced.

Wild and Scenic Rivers:

No significant impacts are expected on the proposed sections of the Agua Fria river.

ACEC's:

No significant impacts on Larry Canyon and Perry Mesa ACEC's are expected.

Mineral Extraction:

This action will not contribute to a larger cumulative effect.

B. IMPACTS OF THE NO CHANGE ALTERNATIVE

1. DIRECT AND INDIRECT IMPACTS:

Air Quality:

Prescribed burning within the allotments may cause temporary visual impairment in the Pine Mountain and Cedar Bench Wilderness areas, and also in the Camp Verde Yavapai-Apache Indian Community in the Verde Valley, which are Class 1 Air Sheds. The Verde Valley and Payson areas could also be affected by burning when winds are from the west or southwest, as they normally are. Burning is normally conducted during summer months, when inversions that would prevent smoke from dispersing vertically are uncommon. These impacts are addressed in the BLM and Tonto National Forest prescribed burn plans for the area.

Water Quality:

If the riparian areas continue to be impacted by livestock grazing, water quality may decrease and standards may be exceeded. The effects of prescribed burning are the same as those described for the proposed alternative.

Wildlife/Threatened or Endangered Species/Species of Special Concern:

Direct and indirect impacts of prescribed burning described for the proposed action would also occur with this alternative.

Riparian conditions on the allotments would improve more slowly due to less flexibility in the management of livestock. Current policies require management of riparian areas. Riparian pastures are currently rested during the growing season.

Vegetation/Watershed Condition:

Vegetation in some parts of both allotments will not meet its physiological requirements to maintain health. During drought conditions, livestock will naturally tend to impact the pastures more due to less flexibility in management.

Soil condition will not improve.

Regular prescribed burns will maintain the grassland by reducing brush and cactus encroachment. However, ability to burn on the recommended 5-7 year cycle is limited due to limited number of pastures on each allotment, and limited flexibility of the plan to provide needed rest after burns.

Riparian Area and Stream Channel Condition:

The key difference in proposed and current management is that cattle are in pastures for longer periods with more potential to impact riparian vegetation and stream channels under current management.

It is difficult to assess trend without monitoring, but it appears that some riparian area and channel conditions are improving. Some seem to be stable and a few reaches may have a downward trend (Johnson and Mason 1997).

Prescribed fire should have no short-term direct or indirect effects on riparian habitat, since buffer zones are provided around these areas. There may be some long-term indirect beneficial effects if the threat of catastrophic fire is reduced.

Livestock Grazing:

Without being able to utilize the Forest Service pasture(s) in summer months, the BLM prescribed burning program could be restricted on the Horseshoe Allotment due to limitations on the amount of time that a pasture could be rested prior to burning. The converse of this is also true; that is to say the Forest Service would benefit from being able to use BLM pastures to provide post-burn rest also. In light to moderate drought years, not having the flexibility of utilizing the pastures on both allotments could result in the authorized numbers of livestock being severely reduced to prevent environmental degradation. There would not be any new range improvements built, and the current grazing conditions would continue. Better distribution of livestock will not be achieved. No additional cost will be incurred.

Recreation:

Recreation use will probably continue to slowly increase.

Cultural Resource and Native American Religious Concerns:

No impact.

Wild and Scenic Rivers:

No significant impacts are expected on the proposed sections of the Agua Fria river.

ACEC's:

No significant impacts on Larry Canyon and Perry Mesa ACEC's are expected.

Mineral Extraction:

No impact.

2. CUMULATIVE IMPACTS:

Air Quality:

Air quality in the large area of the Agua Fria Grassland and its associated communities, is generally good. Factors that most affect it are smoke from fire, both wild and prescribed, and burning fuel in fireplaces in the communities. Since prescribed burns called for in this plan will be done during summer months, there should be no cumulative effect from this activity and wood burning in homes in

Camp Verde, Payson, Cordes, and other small communities nearby.

Water Quality:

It is unlikely that there will any cumulative impacts under this alternative.

Wildlife/Threatened or Endangered Species/Species of Special Concern:

Cumulative impacts of prescribed burning for Alternative B would be the same as those described for Alternative A. Grazing management practices would not be improved as much with this alternative, with the result of less wildlife habitat improvement occurring throughout the allotments.

Implementation of approved Standards and Guidelines will improve grazing management practices, which will improve wildlife habitat, but not as quickly as alternative A.

Vegetation/Watershed Condition:

There will continue to be some areas without sufficient vegetative ground cover to prevent accelerated erosion. Upland vegetation and soil conditions may slowly improve over time.

Riparian Area and Stream Channel Conditions:

Some major tributaries to the Agua Fria River have headwaters on these two allotments. Riparian conditions on the Agua Fria downstream of these tributaries will probably improve only as these tributaries are managed in functioning condition. Over time, vegetation and stream conditions would probably improve.

Recreation:

No significant impacts on recreation are expected.

Cultural Resource and Native American Religious Concerns:

Visitation to archeological sites will continue to increase. With lack of education, monitoring, or interpretation, these sites will remain vulnerable to illegal pothunting.

Wild and Scenic Rivers:

No significant impacts are expected on the proposed sections of the Agua Fria river.

ACEC's:

No significant impacts on Larry Canyon and Perry Mesa ACEC's are expected.

Mineral Extraction:

No impact.

C. IMPACTS OF THE NO GRAZING ALTERNATIVE

1. DIRECT AND INDIRECT IMPACTS:

Air Quality:

Air quality will be not be affected by implementation of this alternative.

Water Quality:

Water quality standards should continue to be met. With no grazing impacts in the riparian areas, stream condition would improve thereby reducing sedimentation into the creeks.

Vegetation/Watershed Condition:

The increased vegetative ground cover will increase infiltration of water into the soil and provide shade and mulch to reduce soil moisture loss through evaporation. Compacted soils would improve most quickly under this alternative.

Wildlife/Threatened or Endangered Species/Species of Special Concern:

Direct and indirect impacts described for the proposed action for prescribed fire would also occur with this alternative.

Competition between wildlife and livestock would be eliminated. Water sources currently maintained for livestock would be eliminated or fall into disrepair, resulting in an increased susceptibility to predation in the pronghorn population on Perry Mesa by concentrating animals at available water sources.

Habitat conditions throughout the allotment would no longer be influenced by livestock grazing. Soil conditions would improve, resulting in improved range condition, vigorous plant growth, and a properly functioning watershed. Riparian systems would improve without the influence of livestock grazing, resulting in increased diversity of riparian-obligate species.

Livestock Grazing:

A determination would need to be made whether to retain certain range developments, such as water developments, or remove them. If they are retained, funding to provide maintenance would need to be provided from other than range betterment funds. All range fences except exterior boundary fences would be removed. The current grazing permittee would no longer have a viable operation, since his guest ranch is also based upon a working livestock ranch.

Costs involved in removing range fences would be approximately \$3000/mile; some cost would be incurred in removing water developments and/or maintaining them for wildlife.

Recreation:

Conflicts between recreationists and livestock operations, such as livestock bed grounds in popular campsites, and cutting of pasture fences or leaving gates open would not occur. There may be fewer water developments for livestock-based recreationists to water their stock.

Cultural Resource and Native American Religious Concerns:

No impact.

Wild and Scenic Rivers:

No significant impacts are expected on the proposed sections of the Agua Fria River.

ACEC's:

No significant impacts on Larry Canyon and Perry Mesa ACEC's are expected.

Mineral Extraction:

No impact.

2. CUMULATIVE IMPACTS:

Air Quality:

Air quality in the large area of the Agua Fria Grassland and its associated communities, is generally good. Factors that most affect it are smoke from fire, both wild and prescribed, and burning fuel in fireplaces in the communities. Since prescribed burns in the ongoing burning program will be done during summer months, there should be no cumulative effect from this activity and wood burning in homes in Camp Verde, Payson, Cordes, and other small communities nearby.

Water Quality:

The cumulative effect of no grazing, with continuation of the already existing burning program should be beneficial.

Wildlife/Threatened or Endangered Species/Species of Special Concern:

Indirect and cumulative impacts associated with prescribed burning would be the same as those described for Alternative A. With the removal of livestock grazing from the ecosystem, wildlife habitat would improve. Pronghorn and other large herbivore movement would be uninhibited by fencing. Competition between livestock and wildlife would no longer occur for natural water sources.

Vegetation/Watershed Condition:

Watershed condition would probably improve more quickly than under the proposed action.

Riparian Area and Stream Channel Conditions:

The no grazing alternative will have a beneficial cumulative effect for all riparian areas and stream channels in the Copper Creek Allotment. Vegetation and stream conditions would improve most quickly under this alternative.

Livestock Grazing:

This alternative would remove grazing from some of the most productive rangelands on the Tonto National Forest and Phoenix Field Office Area of the BLM.

Recreation:

This alternative would have no impact on recreation activities in the area of the Agua Fria Grassland.

Cultural Resource and Native American Religious Concerns:

Visitation to archeological sites will continue to increase. With lack of education, monitoring, or interpretation, these sites will remain vulnerable to illegal pothunting.

Wild and Scenic Rivers:

No significant impacts are expected on the proposed sections of the Agua Fria river.

ACEC's:

No significant impacts on Larry Canyon and Perry Mesa ACEC's are expected.

Mineral Extraction:

No impact.

VIII. MITIGATION MEASURES

A. PROPOSED ACTION ALTERNATIVE

Fence would be constructed south of Bishop Creek, so that Cornstalk Pasture will not include this section of riparian.

Improvements called for will be planned to avoid conflicts with cultural sites and threatened, endangered or sensitive species. If conflicts cannot be avoided, further environmental analysis, public involvement, and mitigation will be completed prior to any ground-disturbing activities.

All improvements would conform to BLM/FS and Arizona Game and Fish Department wildlife standards for mule deer and pronghorn.

Best Management Practices will be used to avoid adverse impacts by grazing cattle to watershed and water quality. For livestock grazing, these practices include: controlling livestock numbers and season of use; and controlling livestock distribution by fence construction, a pasture system of management, development of waters, herding to shift livestock locations, use of salt and supplemental feed as tools to gain proper distribution of livestock, and prescribed burning.

Prescribed burns should be completed outside the peak activity periods for desert tortoise, where the habitat is unsurveyed but considered suitable on the Copper Creek Allotment.

Acquire necessary air pollution permits and conduct prescribed burning in compliance with air regulatory agency statutes and guidelines. Control prescribed burning activities to minimize visibility reduction and adverse smoke effects on Class I Air Sheds, public facilities, private lands, and other smoke-sensitive areas (U.S. Forest Service 1994).

Individual projects within this EA will comply with Section 106 of the National Historic Preservation Act.

B. NO CHANGE ALTERNATIVE

Some other method would need to be found to alleviate summer-season grazing pressure on riparian areas on BLM lands.

Best Management Practices are currently used to avoid adverse impacts by grazing cattle to watershed and water quality.

Prescribed burns should be completed outside the peak activity periods for desert tortoise, where the habitat is unsurveyed but considered suitable on the Copper Creek Allotment.

Acquire necessary air pollution permits and conduct prescribed burning in compliance with air regulatory agency statutes and guidelines. Control prescribed burning activities to minimize visibility reduction and adverse smoke effects on Class I Air Sheds, public facilities, private lands, and other smoke-sensitive areas (U.S. Forest Service 1994).

C. NO GRAZING ALTERNATIVE

The Eastern Arizona Grazing Environmental Impact Statement Draft states that the Horseshoe Allotment (BLM) will be grazed. This document would need to be changed if a decision were made not to graze livestock.

Existing water developments should be maintained for use by wildlife.

Prescribed burns should be completed outside the peak activity periods for desert tortoise, where the habitat is unsurveyed but considered suitable on the Copper Creek Allotment.

Acquire necessary air pollution permits and conduct prescribed burning in compliance with air regulatory agency statutes and guidelines. Control prescribed burning activities to minimize visibility reduction and adverse smoke effects on Class I Air Sheds, public facilities, private lands, and other smoke-sensitive areas (U.S. Forest Service 1994).

IX. MONITORING

A. PROPOSED ACTION ALTERNATIVE

1. Implementation Monitoring:

Riparian Area and Stream Channel Condition:

Implementation monitoring will occur annually in late spring/early summer after cattle come off the Mesa Butte, Bobcat, Cornstalk and Granite Pastures. Key reaches will be walked to estimate use on woody and herbaceous species and assure that cattle have been removed from the pastures.

Key reaches include:

Bobcat Pasture:

- 1) Silver Creek below FR 677 to FS/BLM boundary
- 2) Silver Creek above FR 677 to FR 577 crossing
- 3) Bishop Creek above FR 677 to Pasture boundary Cornstalk Pasture:
- 4) Copper Creek ½ mile both above and below FR 390 crossing Mesa Butte Pasture:
- 5) Copper Creek ½ mile reach above Piedmont Well.
- 6) Bishop Creek above FR 1981 crossing upstream ½ mile.

Another key reach may be established along upper Silver Creek in the Granite Pasture.

Livestock Grazing:

Use levels of key species in key areas will be monitored during and/or after the grazing season so that levels of 40% are not exceeded.

Recreation:

Recreation permits will be monitored to ensure that all stipulations are being followed. Monitoring of permits will occur at least annually, unless a special event is authorized which requires a post-event compliance check.

2. Effectiveness Monitoring:

Riparian Area and Stream Channel Condition:

Use Riparian Functional Condition checklist to evaluate functioning condition of Silver Creek, Bishop Creek, Indian Creek and the Agua Fria River in 1998, 2001, and 2004.

Stream Channels:

A permanent stream cross section was established in Copper Creek to monitor changes in stream channel morphology. Another cross section will be established in lower Silver Creek in the perennial reach east of the Forest Service boundary fence. Stream cross sections will be remeasured every 5 years. Stream stability (Pfankuch) (USDA 1973) and riparian condition ratings (USDI 1991) will be used to quantify and record change at five year intervals.

Riparian Vegetation:

A permanent vegetation transect was established in the vicinity of the Copper Creek stream cross section to monitor: 1) recruitment and use of woody species; and 2) cover and use of deergrass. An additional survey will be established in lower Silver Creek east of the Forest Service boundary fence. Transects will be remeasured annually.

The two riparian surveys in upper Bishop Creek and in the Copper Creek administrative pasture should be repeated after one complete grazing rotation.

Five photopoints have been established on the Copper Creek Allotment. They are rephotographed annually.

Watershed Condition:

The BLM currently has two monitoring plots on the ranch that are both within the same range site. Two new transects have been established on the Horseshoe Ranch, one on the Loam Hills and one in the Rock Outcrop range site types. Three grazing exclosures have been built adjacent to the range trend transects. Transects will be read utilizing the dry weight rank pace frequency method with 40 cm² quadrats (Smith and Despain 1990).

The Forest Service currently has 9 Parker Three Step clusters on the allotment that are in three range site types. These transects are in key areas and will be used for monitoring using Parker 3-Step and/or Frequency Plot methods.

Read all key area monitoring sites once to establish baseline data, then read the transects after a grazing cycle and as necessary after burns through the year 2006.

Wildlife:

Sample fish every 2 years in Silver Creek, Larry Creek tributary using electrofishing and/or seines to determine native and exotic species presence and relative abundance. Expand this effort to include any introduction sites for native fish.

Utilize Arizona Game and Fish Department pronghorn and deer survey results to assess distribution, recruitment, and relative abundance response to management actions related to movement and water availability.

Document waterfowl using partially fenced and unfenced water tanks 2 times during the winter and once during the summer. Compare waterfowl use on treated and untreated tanks to determine effectiveness of partial exclosures.

Cultural Resources:

Site Stewards will assist both agencies in monitoring archeological sites on both allotments.

Air Quality:

A camera that monitors visibility in the Pine Mountain Wilderness is maintained by the Cave Creek Ranger District. Photographs are taken 3 times daily, year-round, and are shipped to a Forest Service contract lab for analysis every 10 days.

3. Validation Monitoring:

Watershed Monitoring:

In five years, after baseline monitoring information has been established, evaluate whether objectives were valid and if the resource is moving positively toward them. Redefine objectives if necessary.

B. NO CHANGE ALTERNATIVE

1. Implementation Monitoring:

Riparian Area and Stream Channel Condition:

Implementation monitoring will occur annually in late spring/early summer after cattle come off the Mesa Butte, Bobcat, Cornstalk and Granite Pastures. Key reaches will be walked to estimate use on woody and herbaceous species and assure that cattle have been removed from the pastures.

Key reaches include:

Bobcat Pasture:

- 1) Silver Creek below FR 677 to FS/BLM boundary
- 2) Silver Creek above FR 677 to FR 577 crossing
- 3) Bishop Creek above FR 677 to Pasture boundary Cornstalk Pasture:
- 4) Copper Creek ½ mile both above and below FR 390 crossing Mesa Butte Pasture:
- 5) Copper Creek ½ mile reach above Piedmont Well.
- 6) Bishop Creek above FR 1981 crossing upstream ½ mile.

Another key reach may be established along upper Silver Creek in the Granite Pasture.

Recreation:

Recreation permits will be monitored to ensure that all stipulations are being followed. Monitoring of permits will occur at least annually, unless a special event is authorized which requires a post-event compliance check.

2. Effectiveness Monitoring:

Riparian Area and Stream Channel Condition:

Use Riparian Functional Condition checklist to evaluate functioning condition of Silver Creek, Bishop Creek, Indian Creek and the Agua Fria River in 1998, 2001, and 2004.

Stream Channels:

A permanent stream cross section was established in Copper Creek to monitor changes in stream channel morphology. Another cross section will be established in lower Silver Creek in the perennial reach east of the Forest Service boundary fence. Stream cross sections will be remeasured every 5 years. Stream stability (Pfanckuch) (USDA 1973) and riparian condition ratings (USDI 1991) will be used to quantify and record change at five year intervals.

Riparian Vegetation:

A permanent vegetation transect was established in the vicinity of the Copper Creek stream cross section to monitor: 1) recruitment and use of woody species; and 2) cover and use of deergrass. An additional survey will be established in lower Silver Creek east of the Forest Service boundary fence. Transects will be remeasured annually.

The two riparian surveys in upper Bishop Creek and in the Copper Creek administrative pasture should be repeated after three years.

Five photopoints have been established on the Copper Creek Allotment. They are rephotographed annually.

Watershed Condition:

The BLM currently has two monitoring plots on the ranch that are both within the same range site. Two new transects have been established on the Horseshoe Ranch, one on the Loam Hills and one in the Rock Outcrop range site types. Three grazing exclosures have been built adjacent to the range trend transects. Transects will be read utilizing the dry weight rank pace frequency method with 40 cm² quadrats (Smith and Despain 1990).

The Forest Service currently has 9 Parker Three Step clusters on the allotment that are in three range site types. These transects are in key areas and will be used for monitoring using Parker 3-Step and/or Frequency Plot methods.

Read all key area monitoring sites once to establish baseline data, then read the transects after three years and as necessary after burns through the year 2006.

Wildlife:

Sample fish every 2 years in Silver Creek, Larry Creek tributary using electrofishing and/or seines to determine native and exotic species presence and relative abundance. Expand this effort to include any introduction sites for native fish.

Utilize Arizona Game and Fish Department pronghorn and deer survey results to assess distribution, recruitment, and relative abundance response to management actions related to movement and water availability.

Cultural Resources:

Site Stewards will assist both agencies in monitoring archeological sites on both allotments.

Air Quality:

A camera that monitors visibility in the Pine Mountain Wilderness is maintained by the Cave Creek Ranger District. Photographs are taken 3 times daily, year-round, and are shipped to a Forest Service contract lab for analysis every 10 days.

3. Validation Monitoring:

Watershed Monitoring:

In five years, after baseline monitoring information has been established, evaluate whether objectives were valid and if the resource is moving positively toward them. Redefine objectives if necessary.

C. NO GRAZING ALTERNATIVE

1. Implementation Monitoring:

None is necessary.

2. Effectiveness Monitoring:

Riparian Area and Stream Channel Condition:

Use Riparian Functional Condition checklist to evaluate functioning condition of Silver Creek, Bishop Creek, Indian Creek and the Agua Fria River in 1998, 2001, and 2004.

Stream Channels:

A permanent stream cross section was established in Copper Creek to monitor changes in stream channel morphology. Another cross section will be established in lower Silver Creek in the perennial reach east of the Forest Service boundary fence. Stream cross sections will be remeasured every 5 years. Stream stability (Pfankuch) (USDA 1973) and riparian condition ratings (USDI 1991) will be used to quantify and record change at five year intervals.

Riparian Vegetation:

A permanent vegetation transect was established in the vicinity of the Copper Creek stream cross section to monitor: 1) recruitment and use of woody species; and 2) cover and use of deergrass. An

**GRAZING SCHEDULE FOR COPPER CREEK/HORSESHOE ALLOTMENTS
YEAR 2**

PASTURE	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
COW HERD - 450 HEAD												
BOONE	XXXX	X										
DOUBLE TANK		XXX	XX									
CORNSTALK			XX	XXXX								
PERRY MESA					XXXX	XXXX	XX					
LOUSY												
JOE'S HILL							XX	XXXX	XX			
NEW MILL									XX	XXXX	XX	
COPPER 1 & 2											XX	
SOUTH RIVER												XX
NORTH RIVER												XX
YEARLING HERD - 950 HEAD JANUARY 1 - MAY 15						860 HEAD NOVEMBER 15 - DECEMBER 31						
BOBCAT												
GRANITE											XX	XX
MESA BUTTE	X XXX	XXXX	X									XX
BROOKLYN			XXX	XXXX	XX							

additional survey will be established in lower Silver Creek in the perennial reach east of the Forest Service boundary fence. Transects will be remeasured annually.

The two riparian surveys in upper Bishop Creek and in the Copper Creek administrative pasture should be repeated after three years.

Five photopoints have been established on the Copper Creek Allotment. They are rephotographed annually.

Watershed Condition:

The BLM currently has two monitoring plots on the ranch that are both within the same range site. Two new transects have been established on the Horseshoe Ranch, one on the Loam Hills and one in the Rock Outcrop range site types. Three grazing exclosures have been built adjacent to the range trend transects. Transects will be read utilizing the dry weight rank pace frequency method with 40 cm² quadrats. (Smith and Despain 1990) This will be done at 5 year intervals to document watershed response to the continuing burn program and to no grazing by domestic livestock.

The Forest Service currently has 9 Parker Three Step clusters on the allotment that are in three range site types. These transects are in key areas and will be used for monitoring using Parker 3-Step and/or Frequency Plot methods.

Read all key area monitoring sites once to establish baseline data, then read the transects after five years to document watershed changes due to burns and no grazing.

Wildlife:

Sample fish every 2 years in Silver Creek and Larry Creek tributary using electrofishing and/or seines to determine native and exotic species presence and relative abundance. Expand this effort to include any introduction sites for native fish.

Utilize Arizona Game and Fish Department pronghorn and deer survey results to assess distribution, recruitment, and relative abundance response to management actions related to movement and water availability.

Cultural Resources:

Site Stewards will assist both agencies in monitoring archeological sites on both allotments.

Air Quality:

A camera that monitors visibility in the Pine Mountain Wilderness is maintained by the Cave Creek Ranger District. Photographs are taken 3 times daily, year-round, and are shipped to a Forest Service contract lab for analysis every 10 days.

3. Validation Monitoring:

Watershed Monitoring:

In five years, after baseline monitoring information has been established, evaluate whether objectives were valid and if the resource is moving positively toward them. Redefine objectives if necessary. Monitoring of grazing use will not be necessary.

X. CONSULTATION AND COORDINATION

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Pat Crouch, Az. Game and Fish Dept.
Patti Fenner, Tonto National Forest
Emily Garber, Tonto National Forest
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Tim Hughes, Bureau of Land Management
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Jack Ragsdale, Bureau of Land Management
Connie Stone, Bureau of Land Management
Darrell Tersey, Bureau of Land Management
Lauren Turner, Tonto National Forest
U.S. Fish and Wildlife Service
Dick Wilcox, Horseshoe Ranch
Scott Wood, Tonto National Forest

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Copper Creek/Horseshoe Allotment Coordinated Resource Management Plan Appendices

- A. Threatened and Endangered Species and Species of Special Concern
- B. Grazing Schedules for Proposed Action and Alternative B (Current Management)
- C. Copper Creek and Horseshoe Allotment maps
- D. Desired Condition for the Agua Fria Grassland Ecosystem
- E. Glossary
- F. Documentation of Public Meeting of 4/20/96 and Agency Response to Comments
- G. Pasture Acreage, Capacity, and Use by Year for Proposed Action
- H. Process Record Index
- I. Agency Response to Final Comments and Questions

Appendix A.
Threatened and Endangered Species, and Species of Special Concern

Threatened and endangered species, and species of special concern that occur in the area, or have suitable habitat in the area, include the following:

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Maricopa Tiger Beetle	<u>Cicindela oregona maricopa</u>	C2
Parker's Riffle Beetle	<u>Cyloepus parkeri</u>	C2, SC
Gila Chub	<u>Gila intermedia</u>	C2, ST
Gila Sucker	<u>Catostomus clarki</u>	C2
Longfin Dace	<u>Agosia chrysogaster</u>	C2
Mexican Garter Snake	<u>Thamnophis eques</u>	C2, SC
Lowland Leopard Frog	<u>Rana yavapaiensis</u>	C2, SC
Arizona Southwestern Toad	<u>Bufo microscaphus microscaphus</u>	C2
Chuckwalla	<u>Sauromalus obesus</u>	C2
Gila Monster	<u>Heloderma suspectum</u>	S
Desert Tortoise	<u>Gopherus agassizii</u>	C2
Ferruginous Hawk	<u>Buteo regalis</u>	C2, ST
Harris' Hawk	<u>Parabuteo unicinctus</u>	S
Swainson's Hawk	<u>Buteo swainsoni</u>	C3
Common Black-hawk	<u>Buteogallus anthracinus</u>	SC
Zone-tailed Hawk	<u>Buteo albonotatus</u>	S
Western Yellow-billed Cuck	<u>Coccyzus americanus occidentalis</u>	C3B, ST
Greater Western Mastiff-bat	<u>Eumops perotis californicus</u>	C2
Red Bat	<u>Lasiurus borealis</u>	SC
Spotted Bat	<u>Euderma maculatum</u>	C2, SC
Townsend's Big-eared Bat	<u>Plecotus townsendii</u>	C2
California Leaf-nosed Bat	<u>Macrotus californicus</u>	C2, SC
Southwestern Cave Bat	<u>Myotis velifer</u>	C2
Yuma Myotis	<u>Myotis yumanensis</u>	C2
Yavapai Arizona Pocket Mouse	<u>Perognathus amplus amplus</u>	C2
Ringtail	<u>Bassariscus astutus</u>	S
Toumey Agave	<u>Agave toumeyana bella</u>	SR
Arizona Agave	<u>Agave arizonica</u>	LE, S, HS
Hohokam Agave	<u>Agave murpheyi</u>	C2

- LE = Listed as Endangered by USFWS under the Endangered Species Act, 1973
 C2 = Former Candidate Category 2, now Tonto National Forest Sensitive and BLM sensitive
 C3B = Formerly listed as Category 3B by USFWS under the Endangered Species Act, 1973
 ST = State Threatened on the Department's Threatened Native Wildlife List
 SC = State Candidate on the Department's Threatened Native Wildlife List
 S = Classified as "sensitive" by the Regional Forest when occurring on lands managed by the U.S. Forest Service
 HS = Highly Safeguarded as defined by Arizona Native Plant Law (1990)
 SR = Salvage Restricted as defined by Arizona Native Plant Law (1990)

Current Grazing Management on the BLM-Administered Horseshoe Allotment

The Horseshoe Allotment has no formal grazing schedule to follow. The grazing rotation is informal and relatively general. It has been implemented for the past 4 years by mutual agreement between the BLM and the lessee. A brief description of the livestock rotation follows.

The Horseshoe Allotment currently uses the next best pasture grazing system for rotation of the cattle on the BLM-administered lands. This strategy uses the following guidelines. The rotation starts at the south end of the allotment in the spring, and moves north through the pastures during the summer and ending up in the vicinity of the headquarters for fall roundup. The cattle then utilize the riparian pastures on the north and west side of the allotment during the winter months. This provides the riparian pastures complete growing season rest every year. The lessee coordinates the pastures moves with the BLM to allow pastures to be rested during the spring so that they may be burned as part of the prescribed burn program for the Agua Fria Grasslands. The lessee uses Bull Pasture in the spring, fall, and summer months for bulls, and the lower Silver Creek riparian pasture for bulls in the winter.

**GRAZING SCHEDULE FOR COPPER CREEK/HORSESHOE ALLOTMENTS
YEAR 1**

PASTURE	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
COW HERD - 386 HEAD												
BOONE	XXXX	XX										
DOUBLE TANK		XX	XXXX	XX								
CORNSTALK												
PERRY MESA				XX	XXXX	XXXX	XXXX					
LOUSY								XXXX				
JOE'S HILL												
NEW MILL									XXXX	XXXX	XX	
COPPER 1 & 2												
SOUTH RIVER											XX	XX
NORTH RIVER												XX
YEARLING HERD - 950 HEAD												
BOBCAT											XX	
GRANITE												XXXX
MESA BUTTE	XXXX	XXXX	X									
BROOKLYN			XXX	XXXX	XX							

GRAZING SCHEDULE FOR COPPER CREEK/HORSESHOE ALLOTMENTS YEAR 3

PASTURE	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
COW HERD - 500 HEAD												
BOONE	XXXX											
BOBCAT		XXX										
DOUBLE TANK												
CORNSTALK		X	XXXX	X								
NEW MILL				XXX	XXXX							
JOE'S HILL						XXXX	XXXX					
LOUSY								XXX				
PERRY MESA								X	XXXX	XXXX		
COPPER 1 & 2											XX	
SOUTH RIVER											XX	XX
NORTH RIVER												XX
YEARLING HERD - 860 HEAD			JANUARY 1 - MAY 15				623 HEAD NOVEMBER 15 - DECEMBER 31					
GRANITE												
MESA BUTTE	XXXX	XXXX									XX	XXXX
BROOKLYN			XXXX	XXXX	XX							

GRAZING SCHEDULE FOR COPPER CREEK/HORSESHOE ALLOTMENTS YEAR 4

PASTURE	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
COW HERD - 500 HEAD												
BOONE												
BOBCAT/GRANITE	XXXX	XXXX										
DOUBLE TANK			XXXX	X								
CORNSTALK				XXX	XX							
PERRY MESA												
LOUSY					XX	X						
JOE'S HILL						XXX	XXXX	X				
NEW MILL								XXX	XXXX			
COPPER 1 & 2 / BULL - 250 HD.										XXXX		
BROOKLYN - 250 HD.										XXXX		
SOUTH RIVER											XXXX	
NORTH RIVER												XXXX
YEARLING HERD - 623 HEAD JANUARY 1 - MAY 15						375 HEAD NOVEMBER 15 - DECEMBER 31						
BOBCAT											XX	
GRANITE												XXXX
MESA BUTTE	XXXX	XXXX										
BROOKLYN			XXXX	XXXX	XX							

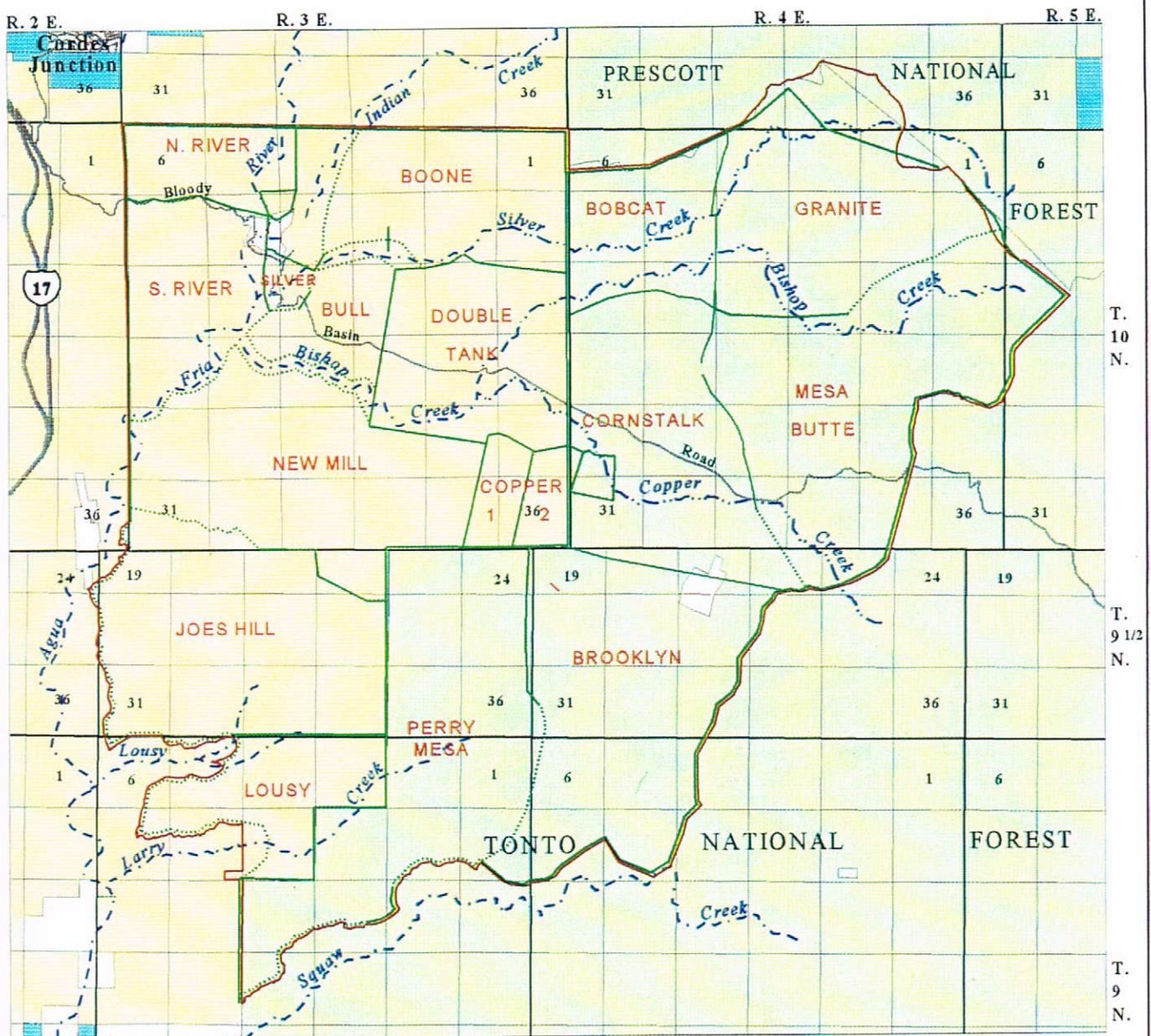
GRAZING SCHEDULE FOR COPPER CREEK/HORSESHOE ALLOTMENTS

YEAR 5

PASTURE	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
COW HERD - 500 HEAD												
BOONE	XXXX											
DOUBLE TANK		XXXX	X									
CORNSTALK			XXX	XXX								
PERRY MESA				X	XXXX	XXXX						
LOUSY							XXXX					
JOE'S HILL								XXXX	XXXX			
NEW MILL										XXXX	XXX	
COPPER 1 & 2											X	
SOUTH RIVER												XX
NORTH RIVER												XX
YEARLING HERD - 950 HEAD												
BOBCAT											XX	
GRANITE												XXXX
MESA BUTTE	XXXX	XXXX	X									
BROOKLYN			XXX	XXXX	XX							

HORSESHOE RANCH ALLOTMENT

Pastures



LEGEND

- | | |
|---|--|
|  BLM Land |  Allotment Boundary |
|  State Land |  Fence |
|  National Forest |  Natural Barrier |
|  Private Land | |

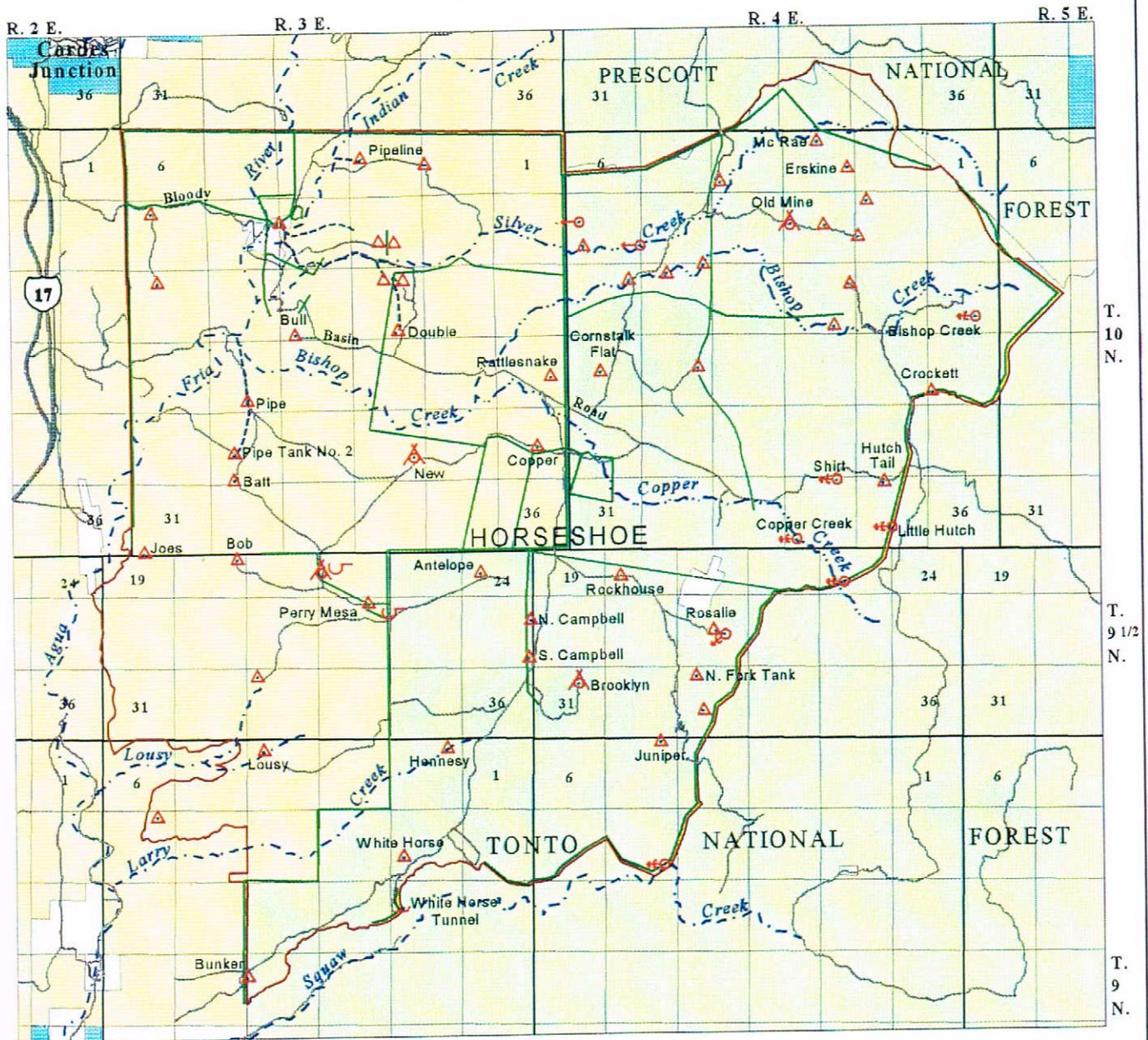
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HORSESHOE RANCH ALLOTMENT

Range Developments



LEGEND

- | | | |
|-----------------|--------------------|-------------------------|
| BLM Land | E-Z Allotment Name | Stock Tank |
| State Land | Allotment Boundary | Windmill |
| National Forest | Fence | Developed Spring |
| Private Land | Pipeline | Livestock Trough |
| | | Corral |
| | | Location of Development |

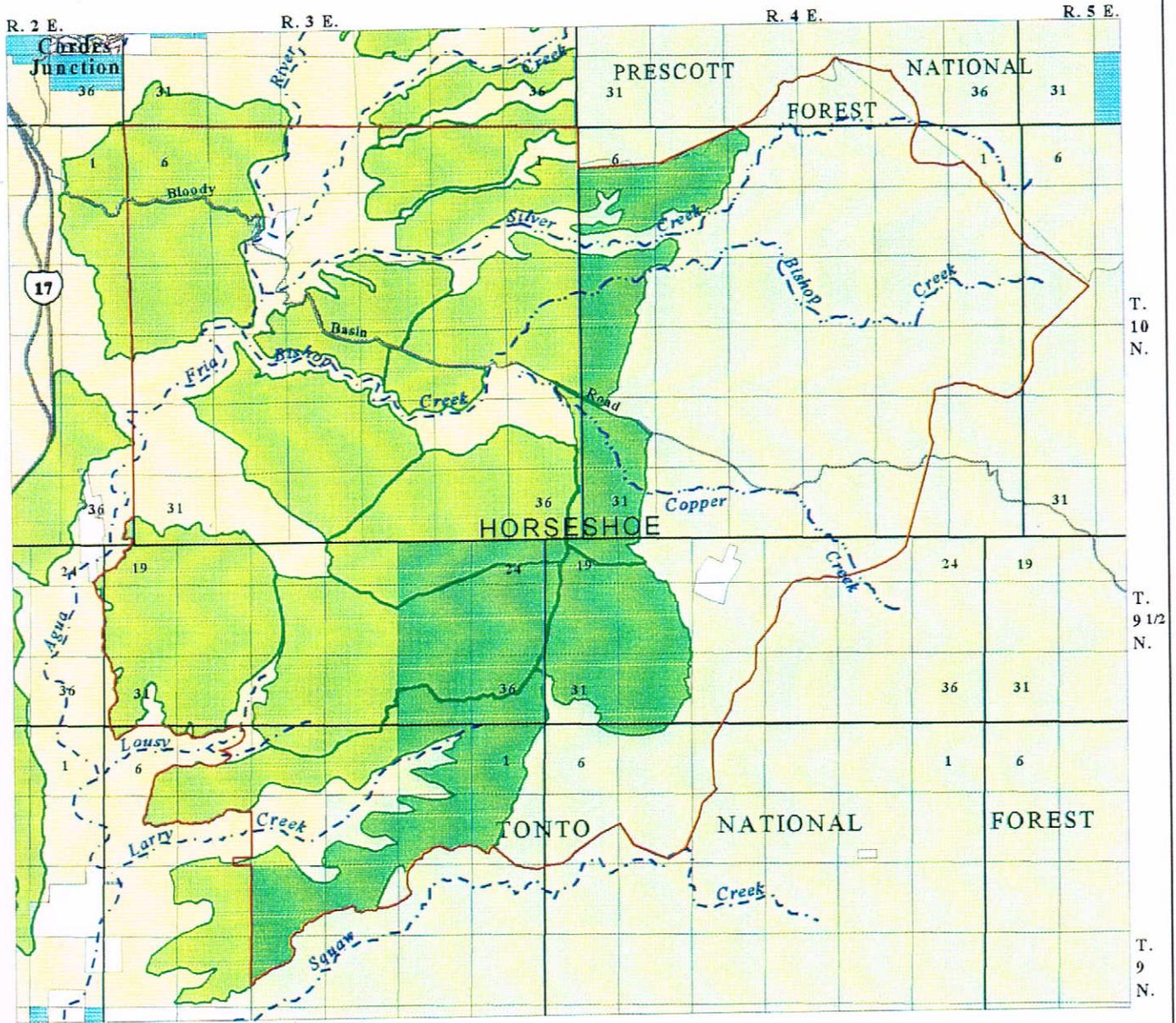
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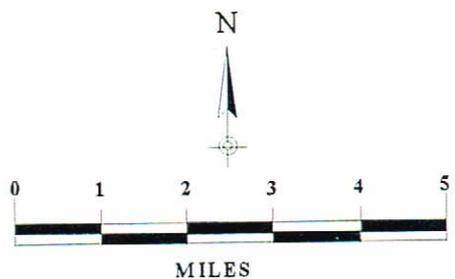
HORSESHOE RANCH ALLOTMENT

Burn Units



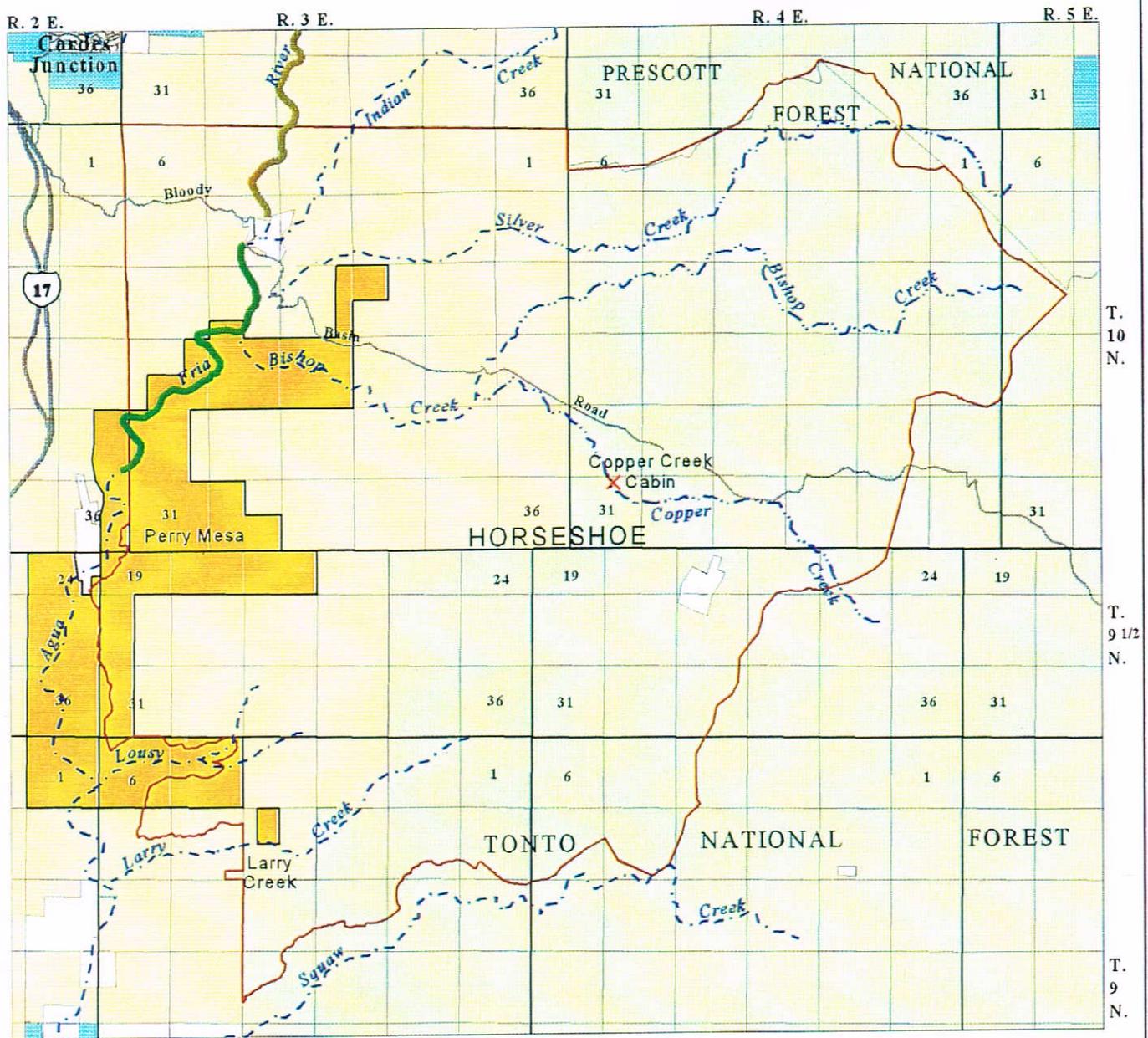
LEGEND

 BLM Land	 HO Allotment Name
 State Land	 Allotment Boundary
 National Forest	 Burn Unit
 Private Land	



HORSESHOE RANCH ALLOTMENT

ACEC, Wild & Scenic Rivers, National Register of Historic Places



LEGEND

- | | |
|---|---|
|  BLM Land |  Allotment Name |
|  State Land |  Allotment Boundary |
|  National Forest |  Wild & Scenic River (Scenic) |
|  Private Land |  Wild & Scenic River (Wild) |
|  Area of Critical Environmental Concern (ACEC) |  National Register of Historic Places site |

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APPENDIX D

Desired Condition Agua Fria Grasslands Ecosystem

The Agua Fria Grassland is a healthy desert grassland with native grasses and forbs dominating the flats, swales, and mesas. A juniper/grassland mosaic is found at the upper end of the watershed. Juniper and chaparral grow on hillsides at higher elevations while chaparral and mesquite are found in the lower areas. Riparian areas support lush vegetation beside flowing streams with native fish, amphibians and aquatic reptiles. Mesquite and other desert shrubs occupy the floodplain outside the riparian zone at lower elevations while higher in the ecosystem this niche is occupied by Ponderosa pine, gambel and white oak and alligator juniper.

Vegetation on the Agua Fria watershed provides a ground cover of living plants and organic matter which causes rainfall to infiltrate into the soil. Soils are stable and productive with erosion limited to natural levels.

Wildlife is abundant and diverse with many types of birds using the riparian zones for nesting. Numerous invertebrates contribute to ecosystem function. Vertebrates include species with widespread habitat adaptability and species which occupy narrow niches in this productive ecosystem. Developments do not present barriers to wildlife movements.

Livestock graze in the grasslands according to management prescriptions which favor native grass species and riparian regeneration. Historic fire levels are present as a result of lightning and human-ignited fires and play a role in maintaining the grassland ecosystem.

A few developed recreation sites complement the high level of dispersed recreational use in the area. Recreational activities evolve from opportunities for people to enjoy and appreciate one of Arizona's largest desert grassland ecosystems.

Rather than merely being a visitor to, people are recognized as a component of the grassland ecosystem.

Cultural resources are actively protected and managed for their scientific and educational values. Selected archeological sites are developed for public visitation and interpreted to explain how people have used and modified the Agua Fria Grassland over the last several thousand years.

Communities of interest learn and work together to provide input to management decisions and establish measuring and monitoring criteria, creating a network which acquires and shares knowledge about the physical, biological, and social dimensions of the Agua Fria Grasslands Ecosystem.

APPENDIX E GLOSSARY

Air Quality: The composition of air with respect to quantities of pollutants therein; used most frequently in connection with standards of maximum acceptable pollutant concentration.

Air Quality Related Values: A feature or property of an area that is affected in some way by air pollution. Identified values are visibility, odor, flora, fauna, soil, water, geologic features, and cultural resources.

Animal Unit Month (AUM): The amount of forage necessary for the sustenance of one cow or its equivalent for a period of one month.

Area of Critical Environmental Concern (ACEC): An area of public land that requires special management attention in order to protect and prevent irreparable damage to important historic, cultural or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

Class I Area: One of three classes of areas provided for in the Clean Air Act for the Prevention of Significant Deterioration Program. Class I areas are the "cleanest" areas and receive special visibility protection. They are allowed very limited increases (increments) in sulfur dioxide and particulate matter concentrations in the ambient air over baseline concentrations.

Key area: In the uplands, a key area is a location that has been selected to be representative of range utilization and condition, and is responsive to changes in management. A key area is regularly utilized by livestock, but is not in a loafing area such as adjacent to water or in a drainage bottom or ridge top. Steep slopes or areas far from water would not reflect changes in management, so would not be suitable key areas. In riparian areas, a key area is a reach (or reaches) accessible to livestock, with critical features like streambanks, or herbaceous or woody vegetation that we want to better manage.

Functioning-At Risk: Riparian /wetland areas that are in functional condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

Key species: The most important forage species on a given range which, when utilized properly, indicates proper use of the range as a whole.

Proper Functioning Condition (PFC): Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment, capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity. The functioning condition of riparian-wetland areas is a result of interaction among geology, soil, water, and vegetation.

Riparian Areas: A form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

Horseshoe/Copper Creek Allotments Coordinated Resource Management Plan
Public Meeting - 20 April 1996
Copper Creek Administrative Site, Tonto National Forest

On Saturday, April 20 at 10:00 A.M., the BLM's Phoenix Resource Area and the Cave Creek District of the Tonto National Forest co-hosted a public meeting to review and discuss the Environmental Assessment and Coordinated Resource Management Proposal for combined management of the Horseshoe Allotment (BLM) and Copper Creek Allotment (FS). Twenty-two people attended the meeting. Attached is the agenda for the meeting. Comments, questions and discussion are summarized below. Questions that required more in-depth response than was given at the meeting are discussed in more detail in this report. Sections commented upon are underlined below. Comments and questions are in bold lettering.

The Coordinated Resource Management Plan was reviewed first:

Affected Environment:

The discussion began with a review of the "Affected Environment"; that portion of the Agua Fria Grassland that lies within the boundaries of the 2 grazing allotments.

Wildlife Habitat:

The Tonto Land Management Plan refers to "Management Indicator Species" to monitor effects of various management practices. What are the indicator species for the Grassland, and what is the Tonto's program to monitor them? Management Indicator Species selected for Desert Grassland are Savannah Sparrow and Horned Lark. Both of these birds are neotropical migrants. Since the Forest Plan was written, biologists have realized that using migratory birds such as these as bioindicators of local ecosystem conditions has some serious limitations. Many factors affecting these birds are beyond our control, and probably beyond our knowledge. Large changes in their populations could occur and have nothing to do with local management practices. It is more reasonable, and more practical to concentrate monitoring efforts on local habitat conditions. While monitoring these particular bird species is definitely of interest to us, the limited staffing we have is best utilized monitoring certain habitat characteristics, such as groundcover, upland vegetation species composition, and riparian condition, more directly.

Soil macroinvertebrates are very important biological components of grasslands. What effort is being made to inventory and monitor them? This would be an excellent subject for research in the Agua Fria Grassland. Since we know of no standards for the area, it would require an intensive effort to develop standards, goals, and desired species composition and numbers. It is more reasonable for us to put our efforts toward improvement and maintenance of a healthy grassland in terms of grass/forb composition and groundcover. If the soil and vegetation components of the ecosystem are functioning properly, a healthy macroinvertebrate population should naturally follow.

We admit our knowledge of soil macroinvertebrates is lacking. But we are open to any research proposal on the subject. There is a lot to learn about many of the unnoticed animals in this ecosystem.

What about reintroducing prairie dogs and beaver?

The historical record does not mention these animals as being present in this grassland. Historically there were 2 species of prairie dog in

Arizona: Black-tailed (Cynomys ludovicianus), and Gunnison's (Cynomys gunnisoni). Black tailed prairie dogs occurred only in the southeastern part of the state from Sulfur Springs Valley to the Mexican border. These were extirpated in about 1938. Gunnison's prairie dogs historically occurred north of the Mogollon Plateau and south of the Colorado River. Present-day distribution of this species is restricted to the area from Seligman to Holbrook and northward.

Beaver occurred along most of the major streams in Arizona, but were absent from most of the western 2/3 of the Gila River system.

Livestock Grazing:

The BLM currently authorizes grazing by additional cattle if ephemeral feed is available. Can the BLM stipulate there be no provision for use of ephemeral feed in the area of the Horseshoe Allotment?

Since this is a part of BLM regulations, this authority will continue to exist. However, use of additional ephemeral feed is discretionary and not mandatory.

Issues:

There are currently differences between existing and desired conditions on these allotments. These issues have been brought forward by the public, the Agua Fria Grassland Coalition, the Forest Service, BLM, and Arizona Game & Fish Department.

Riparian Resource:

Riparian drainages should be managed holistically, as continua from above the area of the allotments to below the western and southern extent of the allotments.

Some of the drainages head up on the Prescott National Forest. Others, such as the Agua Fria, run through large parcels of private lands, over which the BLM and Forest Service have no control.

Wildlife:

Management of the allotments should assure that there is sufficient vegetative cover for antelope fawning and fawn survival.

What about interactions between cattle and antelope?

Arizona Game & Fish personnel present stated that the antelope study done by them in cooperation with Arizona State University found that cattle and antelope typically occupy the same areas. Antelope tend to fawn close to water, in a "donut" around waterholes, in the same types of areas that cattle frequent. While overgrazing would cause conflicts, proper grazing appears to be compatible with healthy antelope populations.

Antelope prefer watering at stock ponds and other waters out in the open, over watering in more natural riparian areas. This is due to the fact that predation is much more likely to occur within the riparian tree canopy than at a stock pond in the open grassland. Antelope avoid predation by having long sight-distance and the ability to outrun their predators.

How did antelope avoid this predation problem before people and livestock moved into this country?

They probably didn't entirely avoid predation in riparian areas. The numbers of antelope were so much higher that a high number could be killed through predation without damaging the population as a whole. Also, in wetter times, segments of streams that are dry now may have had perennial water in historic times, and they may have presented a more open aspect with natural water for antelope. Another related factor is the current

fragmentation of habitat caused by the Black Canyon Highway, brush encroachment, and development of private lands within the huge grassland area to which antelope used to have unobstructed access. They may have been able to travel long distances to natural waters that did not have cover characteristics that favored predation.

Proposed Management Actions:

A1. Limit livestock grazing in all riparian pastures to winter season of use, November 1 through March 1.

There is some disagreement that winter grazing is not detrimental to riparian vegetation and streambank stability. Cave Creek, on the Tonto National Forest's Cartwright Allotment, has winter seasonal grazing yet streambanks appear trampled when cattle are in that pasture.

The system in place on the Cartwright Allotment (Cave Creek drainage) has 6-month winter grazing periods, whereas this plan calls for one to two-month grazing periods.

Examples were cited by BLM & FS of winter-seasonal grazing that has resulted in proper functioning riparian areas that are in good condition: the EZ Ranch on Dry and Little Ash Creeks, and the Verde River within the Skeleton Ridge Allotment on the Tonto have both had healthy riparian communities when grazed during winter months.

Other riparian areas improved under winter/early spring seasonal grazing include:

Burro Creek, on the Bagdad Allotment in west-central Arizona. (Drennan & Blanton. 1993. Integrated Resource Management and Riparian Improvement on the Bagdad Grazing Allotment. In Proceedings of the Symposium on Vegetation Management of Hot Desert Rangeland Ecosystems. July 28-30, 1993, Phoenix, Az.) Cottonwood/willow type riparian areas were grazed for 6 months from October to March. Riparian condition ratings and diversity of age class structure improved when utilization of the woody riparian seedlings was reduced from an average of 65% in 1988 (prior to improved management) to under 10% in 1992 and 1993 (under dormant season use).

Date Creek, on the Date Creek Ranch near Wickenburg. (Knight. 1993. Riparian and Range Improvement Using Grazing. In Proceedings of the Symposium on Vegetation Management of Hot Desert Rangeland Ecosystems. July 28-30, 1993, Phoenix, Az.)

Cattle are grazed on Date Creek from October to March. There has been an observed increase in abundance of turtles, and number and species of birds. There are more age-classes of riparian trees. The shape of the creek has changed from u-shaped to v-shaped, banks have grassed over, and the creek itself is deeper. Winter floods of 1993 did heavy damage to portions of the creek both above and below this ranch, where livestock management is not winter/spring seasonal.

What research is there that demonstrates winter grazing to be compatible with healthy riparian communities?

Some literature citations are listed below:

Goodman, Tim, Gary B. Donart, Herman E. Kiesling, Jerry L. Holchek, James P. Neel, and Daniel Manzanares. 1989. Cattle Behavior with Emphasis on Time and

Activity Allocations Between Upland and Riparian Habitats. Journal Article No. 312, Agricultural Experiment Station, Las Cruces, NM.

Abstract: On numerous streams in the Fort Bayard Administrative Site, Gila National Forest, New Mexico, livestock were managed according to a yearlong rest-rotation grazing system with 3 pastures and 4-month grazing periods in a study to determine cattle use and behavior in riparian areas during different seasons. Cattle selection for riparian habitat was observed to be highest from July to September. They observed shifts in habitat use from disproportionately heavy on riparian areas during the growing season to virtually no use during the dormant season.

Platts, William S. 1989. Compatibility of Livestock Grazing Strategies with Fisheries. In Practical Approaches to Riparian Resource Management, proceedings of an educational workshop in Billings, Montana. May 8-11, 1989.

Abstract: Platts, a Fishery Biologist, reviewed 17 grazing strategies for "fishery compatibility" based on their effect on amount of streambank vegetation used, control of animal distribution, streambank stability, control of seasonal plant regrowth, and the ability of the stream-riparian habitat to rehabilitate while under the influence of the strategy. Platts concluded that a winter grazing strategy could be compatible with fishery needs in that it results in "good" streambank stability and "good" stream-riparian rehabilitative potential. Use of riparian pastures was also rated good for these factors.

Miller, William H. and John H. Brock. 1996. Factors Affecting Foraging Behavior of Cattle in riparian and Upland Habitats. Final Report submitted to Rocky Mountain Experiment Station, USDA Forest Service.

Abstract: The authors conducted studies to test the hypotheses that under proper management: 1) livestock use of riparian habitats would be in proportion to the availability of the forage resource, and 2) the use of the riparian habitat would not adversely impact the habitat. Their findings supported the concepts that forage quantity is a major factor influencing cattle distribution and utilization, and under those conditions where upland habitats are as productive as the riparian habitats, cattle habitat selection will be based on habitat availability. They concluded that in the Southwest, light to moderate cattle grazing of good quality rangeland will have no adverse effect on riparian values and functions.

What will happen to riparian areas during drought years?

There is a chance they will be subject to heavier grazing and trampling when other waters dry up and upland forage is not there.

Stocking problems are compounded during drought because grazing becomes more concentrated in some areas due to lack of water in others; also, the total amount of forage available is much less, since 40 percent of a plant that did not grow is much less than 40 percent of one that received adequate moisture and put on good growth.

Flexibility in the plan will allow the permittee to not stock yearlings on the National Forest during dry years - instead these pastures may be used from November through May for the cow/calf herd, relieving pressure on other pastures normally in the cow/calf system area.

This action could be voluntary, or the agencies could make an administrative decision that ranchers would have to de-stock to avoid resource damage during drought years. Grazing levels are a function of both time in the pasture and number of cattle. Either one of these could be lessened to avoid adverse impacts.

Since there is basic disagreement on whether winter grazing allows riparian communities to maintain or improve, a proposal was made to exclude all livestock grazing from some riparian areas. These areas would provide a comparison between no grazing and winter grazing, and will help us determine whether winter grazing is indeed a good management practice for riparian areas. The BLM has constructed one riparian enclosure on Silver Creek. This section of riparian is approximately 150 yards long.

The Forest Service has a half-mile section of Copper Creek with perennial riparian vegetation that has been closed to grazing for the most part for a number of years. Occasionally this pasture is grazed by government horses, and the Copper Creek permittee has been authorized to graze it for short periods for special situations in the past. This administrative unit could be used to provide an effective riparian enclosure.

A2. Install a barrier to control vehicle access downstream of the Bloody Basin Road in the Agua Fria River.

We would need to both post and enforce such a closure.

This would have to be an ongoing activity, since OHV's usually go around such closures and more closures are made necessary.

B1. Use prescribed fire throughout the Horseshoe Ranch on a 5 to 7 year cycle.

How does the presence of red brome relate to grazing and fire in the grasslands? This grass species has been mentioned in recent news articles about fire in the Sonoran desert vegetation type. It carries fire very efficiently in an ecosystem that has not evolved under frequent fire. As a consequence, the cactus component of this ecosystem is being destroyed.

Red brome is an exotic invader species that moves into open areas (areas where vegetative cover has been removed). There could be several reasons that these areas do not have sufficient cover -- fire temporarily removes vegetation; so do continual overgrazing or uncontrolled human activities such as off-highway driving or camping. In the Sonoran desert, large open spaces are a natural part of the aspect. Water is scarce, so a few plants provide a small amount of cover, and their roots take up a lot of space underground. Cryptogamic vegetation (low growing mosses or ferns that are inconspicuous much of the year) may make up much of the interspaces between larger plants in undisturbed Sonoran Desert communities. Once red brome is brought into the picture, it easily invades these open spaces when seasonal rains occur. It quickly dries out, leaving a continual carpet of fine fuels to carry fire. Since the Sonoran Desert evolved under fire frequencies of 150-200 years, the presence of this dry vegetation to carry fire causes dire consequences to the ecosystem. Fires now are occurring at intervals of 5 years or less in some parts of the Sonoran Desert.

In contrast, the grasslands have evolved under fire intervals of about 5-8 years. Perennial grasses that are dormant until summer rains provide a continuous cover of fine dry fuels that carry the fires that are typically ignited by lightning during July monsoons. Red brome serves to carry fire in the grassland, as it does in the Sonoran Desert. It has replaced native perennial grasses in some areas that have been hit hard by overgrazing. The roots of this annual species do not provide nearly the protection to the soil resource that those of perennial grasses do. Consequently, soil erosion is more common in areas that have been invaded by red brome. In addition, when red brome dies back each year, it leaves open spaces for other, more long-lived invader species such as mesquite, catclaw and prickly pear, to move in.

Perennial grasses enter dormancy during the winter, but remain to protect the soil.

Purpose of burns was discussed -- to mimic natural fire in the Grassland ecosystem, which maintains the open grassland aspect. Repeated fire selectively removes brush, trees, and cactus from the vegetation composition. However, our aim is not to "convert" chaparral vegetation to grassland - this is not possible, since the major vegetative type is more soil than fire-controlled. Grassland occurs on deep basalt soils on mesas; chaparral occurs in rocky and/or rugged areas, often with shallow soils.

B2. Limit average utilization to 40 percent of current years growth of key species in key areas.

What are we calling key species?

In the uplands - sideoats, squirreltail, vine mesquite.

In riparian areas - sedges, rushes & riparian-associated grasses such as deergrass.

How will we limit use during drought to this level?

See discussion in section A1, page 4 about grazing riparian areas during drought.

C1. Chemically renovate Perry Mesa Tank and the tinaja downstream in Perry Tank Canyon to eradicate mosquitofish.

What about introducing Gila topminnow into Perry Mesa Tank?

This is an artificial situation - biologists now attempt to place native fish into areas where there are no conflicts, and where the chances of going dry are minimal. Transplants of native fish are more successful when they are placed into natural streams that stand little chance of invasion by exotic fish. The reason for eradicating mosquitofish in Perry Mesa Tank is that the tank overflows into a tributary of the Agua Fria. The mosquitofish can then swim from the Agua Fria upstream into other tributaries that are inhabited by native fish.

What about chemically renovating streams in the Grassland where exotic fish and native fish are in conflict?

Eradication would kill not only the exotics but also the natives. Exotics are probably a fact of life in many of the streams on the Grassland. They are often put in from sources outside, or washed in from stockponds in the area that may be on private lands. We have proven success with placing and maintaining native populations in portions of streams where natural barriers prevent contamination by exotics.

D1. Construct a wildlife water catchment at T9 1/2 N, R3E, Sec. 34.

Adding upland wildlife waters may change components of the ecosystem we have not considered. We are creating an artificial situation. Antelope should water in the riparian areas.

See discussion under wildlife issues.

E2. Coordinate pasture moves with prescribed burning plans for the Agua Fria Grasslands. Pastures to be burned will be rested January through July prior to burning and for one growing season following burning.

Have we considered placing livestock into pastures immediately after burning to incorporate organic matter and "break up" the soil crust?
Our soil scientists tell us that "hoof effect" on soils that have been newly opened up by fire would probably cause accelerated erosion and/or soil compaction. One growing season allows the perennial grasses to produce growth that feeds and strengthens the root systems. Soil crusting has not been demonstrated to be a problem in this area.

E3. Implement the following grazing strategy to achieve good condition on all range sites (See description and Appendix B in Coordinated Resource Management Plan).

There are some discrepancies in the proposal between riparian pasture graze dates between the strategy discussed in the narrative and the schedule charts in Appendix B:

South River, a riparian pasture is shown in the grazing charts as being grazed beginning October 15, instead of November 1.
South River will be grazed beginning November 1.

The Mesa Butte Pasture has riparian areas in it, and grazing charts show it is grazed one year in 5 in April. This is outside the stated strategy of riparian pastures being grazed only November 1 to March 1.
The grazing chart for the year 2000 in Appendix B for the Yearling herd will be corrected to show Mesa Butte to be grazed in February and March.

The narrative states that Bobcat Pasture will be grazed November 1 to March 1, and it also states Bobcat will be grazed by the yearling herd from November 15 to May 15.

The narrative needs to be made consistent with the grazing schedule charts in Appendix B. They show Bobcat Pasture to be grazed in November or December.

The narrative states that the yearling pastures on the Forest will be grazed November 15 - May 15. The charts in Appendix B show grazing from November 1 - April 30. Which is correct?

The charts are incorrect and will be changed.

Silver Creek Pasture is not listed on the grazing charts in Appendix B.

Silver Creek will be used as a riparian pasture, under the constraints listed in Section E3 of the Coordinated Resource Management Plan. Charts in Appendix B will be amended to show Silver Creek Pasture.

Is this plan implementable financially?

There are not many additional improvements called for in the proposal. The plan's emphasis is on grazing strategy and change in pasture moves. Those improvements that are expensive, such as wells, additional waters, and cattle guards will be phased in as funding allows. Some improvements, such as water developments, are more essential to improved management than others. Other sources of funds are available for some projects. Antelope tag funds may be applied for to finance water construction for antelope. Some fence projects may be suitable for Water Protection Fund requests if they protect important riparian areas (such as the fence that will be the northern boundary fence of the Cornstalk Pasture).

Monitoring:

Is it reasonable to expect the agencies will be able to carry out the monitoring in the proposal, given low staffing levels now and reductions in staffing probable in the future?

We have taken into account the decreasing agency work force in design of the monitoring plan. It has already been simplified and scaled down from the original draft of the plan. By measuring key habitat characteristics in key areas we hope to maximize the effectiveness of our time spent monitoring.

What about monitoring species other than antelope?

Arizona Game & Fish conducts routine annual trend surveys for the following animals in the area of the allotments:

Mule deer, White-tail deer, javelina, antelope, waterfowl, quail, dove, and small game such as cottontail rabbit are monitored by Arizona Game & Fish either directly or by hunter surveys.

One person at the meeting stated that, as a member of the public, he would be willing to participate in monitoring on weekends.

Why don't we monitor numbers of sensitive species instead of monitoring the habitat?

Monitoring efforts are most efficiently spent in monitoring key habitat characteristics. The inference is that if the vegetative and soil habitat are in healthy functioning condition, associated species should thrive also. We do monitor some of the sensitive species, such as native fish and Arizona agave. Some bat surveys were done on the Tonto in 1991. Additionally, agency personnel routinely make notes of any observations of sensitive species and send these to the Arizona Game & Fish Database.

Next the Environmental Assessment was reviewed:

Alternatives:

Add an alternative, or include in the proposal, inclusion of a riparian enclosure of significant size. This area would not be grazed at all, and would serve as a comparison area for riparian areas that are grazed.

Impacts:

There would be effects of "no grazing" (Alternative C) on wildlife. Need to discuss this more.

Need to discuss cumulative effects of the proposed action, as related to the rest of the Agua Fria Grassland Ecosystem. For example, downstream effects of improving the watershed; cumulative effects of fire in the ecosystem.

Project Record:

Spell out what "ICO's" stands for.

Issues, Concerns, and Opportunities. This will be spelled out in the final document.

General Comments: Need to explain somewhere the relationship of the two documents to each other (the Environmental Assessment and the Coordinated Resource Management Plan).

The meeting was concluded at 2:00 P.M. Comments given at the meeting, and those received by May 3 will be made a part of the process record.

The next steps are 1) to finalize the Environmental Assessment and Coordinated Resource Management Plan; 2) Responsible officials in both agencies agree upon the proposed action; and 3) publish notice of the final decision.

PASTURE ACREAGE, CAPACITY, AND USE BY YEAR

Pasture Name	Acres	Capacity AUM's	Relative Capacity	Year 1			Year 2			Year 3			Year 4			Year 5		
				Used	Mos.	AUM's	Used	Mos.	AUM's	Used	Mos.	AUM's	Used	Mos.	AUM's	Used	Mos.	AUM's
				Cow herd: 386 head Yearling herd: 950 head			Cow herd: 450 head Yearling herd: 950 head, 860 head *			Cow herd: 500 head Yearling herd: 860 head, 623 head *			Cow herd: 500 head Yearling herd: 623 head, 375 head *			Cow herd: 500 head Yearling herd: 950 head		
Boone	3731	579	2.5	x	1.5	579	x	1.25	563	x	1.0	500				x	1.0	500
Double Tank	3827	593	2.5	x	2.0	772	x	1.25	563				x	1.25	625	x	1.25	563
Cornstalk	5039	787	3.0				x	1.5	675	x	1.5	750	x	1.25	625	x	1.5	675
Perry Mesa	7159	1200	5.0	x	3.5	1351	x	2.5	1125	x	2.25	1125				x	2.25	1125
Lousy	2920	453	2.0	x	1.0	386				x	0.75	375	x	0.75	375	x	1.0	500
Joe's Hill	6025	936	4.0				x	2.0	900	x	2.0	1000	x	2.0	1000	x	2.0	1000
New Mill	5638	876	3.5	x	2.5	965	x	2.0	900	x	1.75	875	x	1.75	875	x	1.75	875
Copper 1 & 2	1200	225	1.0				x	0.5	225	x	0.5	250	x	1.0	250	x	0.25	125
South River	2849	492	2.0	x	1.0	386	x	0.5	225	x	1.0	500	x	1.0	500			
North River	1560	242	1.0	x	0.5	193	x	0.5	225	x	0.5	250	x	1.0	500	x	0.5	250
Bobcat	2800	431	1.75	x	0.5	261				x	.75	375	x	2.5	503	x	0.5	261
Granite	3525	542	2.25	x	1.0	523	x	1.0	473				x	3.0	806	x	1.0	523
Mesa Butte	7833	1205	5.0	x	2.25	1176	x	2.75	1412	x	3.5	1460	x	2.0	685	x	2.25	1176
Brooklyn	7302	1123	4.75	x	2.25	1176	x	2.25	1176	x	2.5	1183	x	3.5	1107	x	2.25	1176
TOTAL F.S.	33,658	5288			9.5	4487		10.0	4861		10.5	4893		12.25	3726		9.75	4936
TOTAL B.L.M.	27,750	4396			8.5	3281		8.0	3601		7.5	3750		8.75	4125		8.25	4038
TOTAL	61,408	9684			18.0	7768		18.0	8462		18.0	8643		21.0**	7851		18.0	8974

* Yearling herd numbers shown as: first part of calendar year (January - May); second part of calendar year (November - December)

** Some pastures used more than once and/or grazed in conjunction with other pastures in Year 4.

**APPENDIX H
PROCESS RECORD INDEX**

Copies of record documentation may be obtained from either the Phoenix District Office of the Bureau of Land Management, 2015 W. Deer Valley Rd, Phoenix Az. or from the Tonto National Forest's Cave Creek Ranger District, P.O. Box 5068, Carefree, Az. 85377.

Letter from Horseshoe Ranch	2-27-93
Agency planning meeting invitation	6-21-93
Project feasibility report	10-8-93
Agua Fria Grasslands Public Meeting Issues, Concerns, and Opportunities	1-15-94
Public meeting invitation	3-17-94
Public meeting agenda; attendance; Issues, Concerns & opportunities	4-8-94
Letter requesting affected interest status Bob Brawdy	3-12-95
Working meeting notes	6-7-95
Letter from Dick Wilcox	9-14-95
Letter from Dick Wilcox	12-7-95
Memo to Fish and Wildlife Service, request for concurrence Not Likely to Affect for Gila Topminnow and Pupfish.	1-31-96
Memo from Fish and Wildlife Service, Sec 7 consultation not required for Gila Topminnow and Pupfish.	2-14-96
Public meeting Invitation	3-25-96
Letter to Tribes with mailing list	3-25-96
Predicision Notice in the Foothills Sentinel	3-27-96, 4-3-96 and 4-10-96
Response from Hopi Tribe	4-2-96
Public meeting agenda and attendance list	4-20-96
Comments received from Jeff Williamson	4-24-96
Comments received from Jeff Burgess	4-24-96
Comments received from Mike Seidman	5-7-96
Comments received from Arizona Game and Fish Department	5-9-96
Comments received from Jeff Burgess	5-9-96
Memorandum of Understanding among BLM, Tonto and Prescott National Forests concerning management of lands and resources in the Agua Fria Grassland Ecosystem	6-3-96
Documentation of Public Meeting of 4/20/96 and Agency Response to Comments	6-96

Soil Scientist Specialist's Report	7-18-96
Article in Arizona Republic: "Tribe Raises Air Standards"	11-30-96
Documentation of Riparian Specialist Field Visit to Copper Creek Allotment	12-24-96
Fire Management Specialist's Desired Condition Statement	2-97
Riparian Specialist's Report	4-17-97
Biological Assessment and Evaluation of the Proposed Action	5-7-97
Agency Response to Final Comments	5-14-97

APPENDIX I.
AGENCY RESPONSE TO FINAL COMMENTS AND QUESTIONS

Letters received follow this summary of comments and questions.

SEIDMAN

1. **Need to analyze at a variety of spatial scales. Take a landscape approach to EM. Look at the "bigger picture". Answer the following questions:**

a-- Relationship between allotments' 65,000 acres & entire grassland?

See new cumulative effects section for each alternative.

b-- Anything especially important about this piece of land?

There are 2 "Areas of Critical Environmental Concern" on the Horseshoe Allotment. A definition of this term is in the glossary, Appendix E. ACEC's are designated because of 2 criteria: importance and relevance. The Perry Mesa ACEC was designated due to a unique blend of three prehistoric cultures. Relevance is due to the serious threat of vandalism.

Larry Canyon ACEC's importance is due to its rare pristine riparian deciduous forest within a desert ecosystem. It is relevant because of special features of considerable value for studies of a desert riparian ecosystem.

c-- Any wildlife here not found elsewhere?

Gila chub are rare in Arizona -- they are found in Silver Creek on the Copper Creek and Horseshoe Allotments. There are no species completely unique to the project area.

-- Any areas critical for certain wildlife species?

Riparian areas are critical for numerous wildlife species. See Issues - Wildlife Habitat; VII A - Wildlife. See also Section II. E., and Appendix A.

e-- Is this area a source for many grassland species that disperse to other areas of the grassland?

The Horseshoe and Copper Creek Allotments are at the southern end of 3 movement corridors for Game Management Unit 21's pronghorn herd. See Section II.E. of the EA.

f-- What % of dispersing animals survive?

For pronghorn, there was no dispersal or interchange of animals between Game Management 19A, on the west side of I-17 and GMU 21 on the east side. This freeway proved to be an effective movement barrier to pronghorn.

There have been no studies that we know of regarding dispersal of animals to other areas of the Grassland from the Copper Creek and Horseshoe Allotments.

g-- Do biotic communities in this area contain all plant & animal species that would naturally occur there, in appropriate degrees of abundance?

See Section IV.E. of the EA. Other than surveys for specific sensitive and/or federally listed plants and animals, there has not been a complete inventory of plants and animals done for the project area, or for the Agua Fria Grassland.

See also response to Comment #12.

h-- Any barriers preventing wildlife movements into/out of allotments?

Fences not constructed to wildlife standard form a barrier to pronghorn movements. This plan proposes to reconstruct fences to meet correct standards for pronghorn. Other barriers to pronghorn movements are brush encroachment (addressed in the plan by conducting a prescribed burning program), and human habitation, which is beyond the scope of this analysis.

2. **The specific portions of the DC are ignored in this EA - invertebrates, rare vertebrates, fragmentation. Need to talk about: termites, viable wildlife populations, biodiversity, wildlife movements & interactions, ecological processes, nutrient & energy cycles, food webs, threads that tie the land, its wildlife & humans together.**

See expanded sections on Existing Environment, Desired Condition, Issues, and discussions of direct, indirect and cumulative effects in Sections II, III, IV and VII.

3. The thrust of this plan is only to mitigate effects of grazing.

One of the main projects this Environmental Analysis was written for was implementing a proposal to graze the Horseshoe and Copper Creek Allotments together. A No Grazing Alternative is also analyzed. Naturally, a large part of the discussion concerns effects of grazing, and mitigation measures that would be necessary to maintain and/or achieve Desired Conditions.

4. Are prescribed burns the first step toward reinstating a natural disturbance regime?

Fire Management Officers from the Tonto and Prescott National Forests and the BLM's Phoenix Resource Area are working on a fire management plan for the Grassland, which will include both prescribed and natural fire. Our goal is to use natural fire and prescribed fire when necessary to maintain a fire mosaic in the Grassland so that very large catastrophic fires do not occur.

The more natural situation that existed 100+ years ago has changed considerably. These changes affect how we deal with natural and prescribed fire, and also determine how natural fires affect the area of the Grassland. Prior to settlements in the area of Cordes Junction and construction of Interstate 17, lightning could have ignited fires in a large area that had potential to burn onto the area that is now the Horseshoe and Copper Creek Allotments. Development has had numerous and complex effects on these starts; developments themselves clear fuels so that fires do not carry, fire fighting agencies extinguish fires in order to protect life and property in settlements; invasion of brushy species often occurs with development - these do not carry fire as well; there are more people in travelled/settled areas to start fires.

5. If the big picture is beyond our understanding, we should scale back our activities until we understand their consequences.

Although we admit we have limited understanding of complex interactions in the Grassland Ecosystem, we do understand some basic concepts and research has provided information that allows us to take steps to move toward Desired Condition. Refer to Section VII. and XI. of the EA

6. Artificial waters for antelope is becoming controversial. More water doesn't necessarily mean more wildlife. Changes in plant species composition & cover resulting from livestock responsible for pronghorn problems more than lack of water. Numbers may be all land can now support. We may be further degrading the system by adding water.

A recent study conducted on the Agua Fria Grassland found optimum spacing for waters to be 1.6 km. or 1 mile. This study also states that humans have helped pronghorn populations by increasing water availability. Livestock water sources built in previously water-less areas have been documented to enhance pronghorn survival and lead to more uniform distribution of pronghorn. Water is particularly important to pronghorn survival and recruitment in the arid Southwest. Refer to Ockenfels et al. Citation in Section XI of the EA. The proposal was developed to prevent heavy use by livestock by decreasing time spent in each pasture, providing more regular rest periods for all areas, restricting growing season grazing in riparian pastures, and a slight decrease in livestock numbers combined with the flexibility to reduce numbers during drought.

WELSH

7. Exclude from grazing the reach of Silver Creek from FR 269 to the Agua Fria River.

This area was not excluded, but there are exclosures on the two allotments, and the proposal has been modified to construct an exclosure on the western 2 miles of Bishop Creek on the Tonto National Forest's Copper Creek Allotment.

There is one riparian exclosure for monitoring in Silver Creek on the Horseshoe Allotment. The Larry Canyon ACEC is a relict riparian area on the Horseshoe Allotment that has never been grazed by livestock, and the BLM has recently completed a large riparian exclosure on an adjacent allotment within the Agua Fria Grasslands.

8. Best plan would be to exclude cattle from all riparian areas, with a few exclosures in upland areas for comparison.

This action would require an amendment to the Phoenix Resource Management Plan Environmental Impact Statement, and publication in the Federal Register. The proposed plan describes management actions that would permit grazing on the allotments without damaging riparian resources.

WILLIAMSON

9. Expand the plan (EA) to address its relationship to the Coalition's efforts & management of the entire grassland. (Same as SEIDMAN #1)

Much more detailed cumulative analysis has been added to this EA.

10. Key components of ecological system have not been clearly identified, not clear they will be monitored to ensure "viability of the ecology" within the watershed over time.

See new section on monitoring, Section IX.

11. Ensure underlying environmental systems are healthy. Monitoring for well-being of these systems over time is not clear.

See new section on monitoring, Section IX.

12. Ensure "appropriate" arrangement and diversity of plants, animals, including invertebrates, vertebrates & fish.

Ensuring "appropriate arrangements" of living things implies we have much more specific control over the environment than we actually do. Certain components of habitat will be monitored that will provide for physiological requirements of native plants and animals in a healthy ecosystem. Key features were selected for a monitoring program that is feasible with current funding and staffing.

13. Add "content" to EA regarding biotic systems and habitat.

Much more "content" has been added since the last version of the EA.

14. Exclude from grazing and recreation use 33% of "affected" riparian area.

This would involve major revisions to both BLM and FS Resource Management Plans. It is not the intent of either agency, nor could it be enforced, to exclude the public from 33% of the riparian areas. Other than localized problems with unauthorized use by off-highway vehicles, nothing leads to the conclusion that general recreation use is causing widespread deterioration of riparian areas. Grazing has been mitigated by restricting season of use in riparian pastures and construction of riparian exclosures. In addition, the monitoring plan calls for intensive monitoring of riparian areas on both allotments. (See Section IX.)

BURGESS

15. How did we determine 1 growing season rest post-burn?

Research recommends grazing tobosa grasslands the growing season immediately following a prescribed burn. (Paulsen & Ares 1962; Wright 1972). Our experience has shown that one growing season's rest works better in this area.

16. What is optimum cover for pronghorn fawns? No management action to address this. Cattle will be in southernmost pastures each spring - the same ones where fawning occurs.

The Perry Mesa Pasture will be grazed in late spring months 3 years in five, for shorter periods than it is grazed under current management. New Mill will be grazed late summer/early fall 4 years in five, and in the spring 1 year in five. Joe's Hill will be grazed late summer one year in five, rested one year, and grazed during summer months 3 years in five. Lousy Pasture will be rested one year in five, and grazed for a one-month period during the summer 4 years in five. All of these pastures are on the southern portion of the grassland. Grazing levels will be monitored so the goal of 40% use of key species in key areas is not exceeded. The goal of prescribed burning is to reduce brush encroachment, which is a major issue in fawn survival. Prescribed burns serve to reduce overall height of the vegetation by removing an invading overstory of mesquite, catclaw, juniper, and other brushy species.

See Section III.E. on pronghorn habitat requirements.

17. How did we get proposed stocking rate? No alternate stocking rates analyzed, as required by law. We are raising the stocking rate from 9072 AUM's to 11,530 AUM's, while we admit that the current # of cattle has degraded resources.

This portion of the EA has been modified. For a clearer idea of stocking rates under proposed management, refer to the chart in Appendix G. Stocking rates for pastures on the Copper Creek Allotment were derived using Production/Utilization studies conducted in the early 1980's, and for the pastures on the Horseshoe Allotment using comparable acres/AUM estimations. Capacity for each pasture was used to determine length of time the cow herd could remain in the pasture. Number of pastures that could be grazed in a given year was determined by rest periods needed to provide for physiological needs of the plants before and after prescribed burns. A major change in the plan is that flexibility is now planned into stocking rates.

18. How could ephemeral grazing already be permitted on Horseshoe Allotment, since BLM just got it recently? Wants to prohibit ephemeral grazing here & on all BLM lands.

See page 2 of Appendix F, "Livestock Grazing" paragraph. This authority exists under BLM regulation, but is discretionary and not mandatory.

19. Disclose costs.

See Section VII. A. 1. Livestock Grazing.

20. Use no grazing alternative to conduct suitability analysis, as we are legally required to do.

Suitability analysis was conducted at the Forest Plan level, as required by the National Forest Management Act.

21. Winter grazing damages riparian.

See discussion and citations in Appendix F, p. 3-4.

22. Riparian monitoring only shows if riparian areas improving. Instead we should measure against what it should look like. We need riparian exclosures for that. There are none in the plan.

See response to comment #7, above. Also refer to Monitoring Section IX in the EA. Baseline standard that will be used to monitor riparian areas on both allotments is Proper Functioning Condition.

23. Proposed a riparian enclosure from Bloody Basin Road & Agua Fria downstream to exclude cattle from Bishop & Silver Creeks below the Bloody Basin Road.

There are already some riparian enclosures on the allotments. One more is planned for Bishop Creek.

ARIZONA GAME & FISH DEPT.

24. Grazing in South River unit from Oct 15 through November according to grazing schedules. Narrative states riparian areas will only be grazed Nov. 1 to March 1. Grazing in the Bobcat unit begins Nov. 1 4 out of 5 years.

These inconsistencies were corrected. See Grazing Schedule for the Proposed Action in Appendix B.

25. Recommend that trailing of livestock through riparian pastures during the growing season occur for the minimum amount of time possible, and avoid holding stock in these pastures overnight.

This will be done. Annual grazing instructions will include a statement about trailing through riparian pastures.

26. Changes in special status species classifications.

This was corrected.

RICE

27. The fact that the large number of prehistoric sites on the Horseshoe and Copper Creek Allotments have not been completely inventoried is of concern.

There have been a large number of sites inventoried in this area; however, the inventory is by no means complete. Since BLM acquired lands on the Agua Fria Grassland, there has been a cooperative effort with the Tonto National Forest to document presence and vandalism of prehistoric sites.

28. Implementation of this Coordinated Resource Management Plan will not result in any increase in grazing intensity on these allotments. This is encouraging.

No response required.

29. We appreciate the fact that information on traditional cultural properties will be withheld from the public domain.

No response required.

30. The fact that the Horseshoe Ranch currently monitors cultural sites affording some protection is a favorable consideration.

No response required.

31. Improvements to include provisions for wildlife is a positive aspect.

No response required.