BIOLOGICAL ASSESSMENT

CARTWRIGHT ALLOTMENT
ALLOTMENT MANAGEMENT PLAN ALTERNATIVES

USDA FOREST SERVICE
TONTO NATIONAL FOREST
CAVE CREEK RANGER DISTRICT
MARICOPA AND YAVAPAI COUNTIES, ARIZONA

Prepared by

Todd Willard
Cave Creek Ranger District
Tonto National Forest
Phoenix, AZ

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INTRODUCTION

This Biological Assessment (BA) assesses the effects of four alternatives considered for the Cartwright Allotment, Cave Creek Ranger District, Tonto National Forest (TNF) on Federally listed or proposed species and their habitats. The Cartwright allotment is located about 40 miles north of Phoenix, with access from the communities of Cave Creek and Carefree. Cartwright allotment includes 55,718 acres within three fifth code watersheds of the Salt and Verde rivers (Figure 1).

CONSULTATION HISTORY

Several consultations on grazing management or actions pertinent to grazing management on Cartwright allotment have occurred. A biological opinion addressed introduction of Gila topminnow (*Poeciliopsis occidentalis occidentalis*) into several sites on Cartwright allotment (Lime Cabin Spring, Bronco Canyon Spring Tank, Camp Creek) in the early 1980's. The biological opinion documented that these reintroductions would be a beneficial recovery action for the species, and that continuation of ongoing activities was not likely to jeopardize the existence of Gila topminnow (topminnow) (U. S. Fish and Wildlife Service [USFWS] 1982; 1983).

An allotment management plan for Cartwright allotment was completed in 1989, and affects of allotment management on Arizona agave (*Agave arizonica*) and Gila topminnow addressed in a biological evaluation. The evaluation erroneously concluded that topminnow was no longer present on the allotment (Kvale 1989).

In 1991, FWS determined that effects of a proposed fire management treatment in the Cave Creek drainage would result in incidental take of topminnow through direct mortality and through habitat destruction and modification. Terms and conditions for implementation of the proposed burn were specified (USFWS 1991), and the burn was carried out with no apparent effects on the fish or habitat.

The Region has been working to reduce or eliminate threats to federally listed species for a number of years. Plan direction for ongoing grazing activities for species other than Mexican spotted owl was considered as part of previous consultations on plans and amendments for the eleven National Forests and National Grasslands of the Region, including the Plan for TNF (USFWS 1997). In 1998, 749 livestock grazing allotments in the region underwent National Environmental Policy Act review and subsequent Section 7 programmatic consultation (USFS 1998b).

This allotment became the subject of a lawsuit regarding non-compliance with the Endangered Species Act in 1998. On December 14, 1998, the Southwest Center for Biological Diversity filed a Complaint for Declaratory and Injunctive Relief in which they challenged the defendant's authorization of livestock grazing on TNF. The basis for the claim was that TNF had failed to consult with FWS pursuant to Section 7(a) of the Endangered Species Act (ESA) regarding the effects of authorizing grazing on specific

grazing allotments. The plaintiffs alleged that TNF continued to violate Section 7(d) of ESA by continuing to graze these allotments prior to completion of consultation.

To insure compliance with ESA, TNF prepared a BAE for Cartwright allotment and the 24 other allotments named in the lawsuit and entered into consultation with FWS on March 31, 1999, on the effects of on-going grazing on listed and proposed species found on these allotments (USFS 1999a).

TNF removed livestock from Cartwright allotment in October 2001 due to drought conditions. Use in riparian areas was exceeding limits and little forage was produced in the uplands (USFS 2000a). FWS was notified that the allotment would not be restocked until range conditions had recovered from drought, and NEPA analysis and Section 7 consultation on grazing management had occurred (USFS 2000b; 2000c). Cattle were restocked into Humboldt pasture for a few months in 2005, and allowable use standards were applied. Cattle have not been on the allotment from 2005 to present. TNF conducted NEPA and completed a BAE for the allotment in 2001. The District did not implement the grazing strategy due to drought conditions on the allotment, which resulted in removal of livestock prior to the Cave Creek Complex (Complex) fire.

The Complex fire occurred during the summer of 2005 and resulted in a significant change to the environment, burning approximately 80% of the allotment (Figure 2). TNF elected to reinitiate the NEPA process due to fire effects on the allotment.

This BA will reference the "*Framework for Streamlining Informal Consultation for Livestock Grazing Activities*" (USFS 2005), referred to through the remainder of this document as "Framework". In addition to the Framework, references for life history, habitat description, distribution, effects analysis, recovery status, and baseline for each species include may include Species Abstracts for the Tonto Forest (USFS, 2000d) and Heritage Data Management System Records (AGFD 2001).

Stocking levels on the Tonto NF are currently lower than they have ever been. In September 2005, the USFS adopted a policy of rangeland adaptive management in Chapter 90 of FSH 2209.13 (Appendix 1). Under this policy, limits on timing, intensity, frequency, and duration of livestock grazing are set in Environmental Assessments with specifics dictated in the Allotment Management Plan (AMP) and Annual Operating Instructions (AOI). However, aspects such as specific dates, livestock numbers, and grazing system are administrative actions and do not require additional National Environmental Policy Act (NEPA) documentation. In addition, the TNF Rangeland Drought Policy (Appendix 2) will be incorporated into adaptive management strategies. The document recognized the need for recovery following drought and as a general rule recommend a minimum of one growing season's rest following drought.

This consultation should be considered valid until such a time that there may be a change in the proposed action, effects, critical habitat designations, or new species are listed. If changes mentioned above occur that are outside the scope of this BA, consultation will be

re-initiated. Specific direction will be provided to each grazing permittee through Annual Operating Provisions (AOP).

DESCRIPTION OF ALTERNATIVES CONSIDERED

PROJECT AREA DESCRIPTION

Cartwright allotment occurs on TNF in the Southwest Region of USFS. Permitted grazing on TNF is authorized by public law as implemented by TNF Land and Resource Management Plan, as amended (Plan) (USFS 1985). The Plan provides guidance and direction for a 10-15 year period. It establishes goals, objectives, and standards and guidelines for multiple-use and sustained yield management of renewable resources. Standards and guidelines for the management and conservation of threatened, endangered, and proposed species, including proposed and designated critical habitat, are included. The Plan provides direction for the protection and enhancement of all threatened, endangered, and proposed species' populations and habitats proposed or designated as critical, and directs site-specific evaluation of all projects and activities with initiation of consultation with FWS, as appropriate. The Plan also contains guidance specific to grazing actions and threatened and endangered species. The Plan delineated about 50 management areas on TNF, each with unique management emphasis and standards and guidelines.

The Plan identifies management prescriptions for wildlife and associated habitat. Prescriptions identify desired future conditions and provide the means to achieve desired conditions. Following are prescriptions specific to wildlife and / or habitat:

-Manage the desert scrub type to emphasize production of javelina, Gambel's quail, and mule deer (USFS 1985). Desirable plant species include calliandra, filaree, sugar sumac, ratany, prickly pear cactus, saguaro seeds, spring annuals, agave chrysantha, seeds of palo verde / catclaw, jojoba / and juniper. Increase in such plant species will provide additional forage and hiding / resting cover for wildlife species (Hoffmeister 1986).

-Manage the pinyon-juniper type to emphasize production of mule deer (USFS 1985). Juniper browse and berries are utilized by the species, generally in the fall (Hoffmeister 1986). Increase in such plant species will provide additional forage and hiding / resting cover for wildlife species

-Manage chaparral type to emphasize the production of whitetail deer (USFS 1985). Desirable plant species include turbinella oak, skunk bush, mesquite, yellow-leaf silktassel catclaw acacia, holly-leaf buckthorn, calliandra, filaree, sugar sumac, and buck brush, ratany and juniper (Hoffmeister 1986). Increase in such plant species will provide additional forage and hiding / resting cover for wildlife species.

-Maintain a minimum of 30% effective ground cover for watershed protection and forage production, especially in primary wildlife forage producing areas. Where less than 30% exists, it will be the management goal to obtain a minimum of 30% effective ground cover (USFS 1985).

-Coordinate with range to achieve at least 80% of the potential riparian overstory crown coverage (USFS 1985).

-Locate and survey all potential Gila topminnow sites. Where feasible, stock sites, monitor for success, and restock if necessary (USFS 1985).

-Identify, survey, map, and analyze habitat for all Federally-listed species. Identify management conflicts and enhancement opportunities. Correct any management conflicts or problems (USFS 1985).

-Coordinate with range to achieve utilization in the riparian areas that will not exceed 20% of the current year annual growth by volume of woody species USFS 1985). (Limiting use to < 50% of terminal leaders on the top 1/3 of plants that are accessible to livestock (<6 feet tall) is used as surrogate guideline because use by volume is extremely difficult to measure where use on terminal leaders is quick and repeatable. Use of 50% of terminal leaders on the top 1/3 of plants is equivalent to approximately 20% of annual growth by volume.)

-Rehabilitate at least 80% of the potential shrub cover in riparian areas through the use of appropriate grazing systems and methods (USDA 1985).

Cartwright allotment is included in Management Area 1F of the Plan. Management emphasis for this area is to manage for a variety of renewable natural resources with primary emphasis on wildlife habitat improvement, livestock forage productions, and dispersed recreation. Watersheds will be managed so as to improve them to a satisfactory or better condition. Riparian areas will be improved and managed to benefit riparian dependent resources. Suitable rangelands will be managed at Level D (USFS 1985).

Due to an increasing awareness of the impacts that livestock grazing can have on riparian areas, the Tonto Forest has established Revised Riparian Area Mitigation Measures (USFS 2007b) in order to clarify existing Plan standards and guidelines and to provide additional direction for management of livestock grazing in riparian areas as follows:

- Obligate riparian tree species – limit use to < 50% of terminal leaders (top 1/3 of plant) on palatable riparian tree species accessible to livestock (usually ≤ 6 feet tall).
- Deergrass – limit use to < 40% of plant species biomass.

- Emergent species (rushes, sedges, cattails, horsetails) – maintain six to eight inches of stubble height during the grazing period.

Green line / stream bank alteration will be measured through the grazing period as an annual indicator and to help determine long term trend. Utilization will be measured seasonally, when livestock are in the pasture. Livestock will be moved from the critical areas (see *Definitions,* Appendix 4) or pastures when recommended guidelines are met. In early seral or degraded riparian areas, plants must become re-established before applying a strategy of management through proper use.

The Cartwright Allotment comprises approximately 55,718 acres on the Tonto National Forest. Elevation ranges from approximately 2,500 feet to 5,208 feet. The Complex fire burned 248,300 acres during the summer of 2005. Approximately 80% of the allotment burned during the Complex fire. As a result, terrestrial and aquatic species and habitats were affected to varying degrees. Habitat recovery has been significant since the fire, although the shrub component in the southern portion of the allotment has been significantly reduced.

General Habitat Conditions

Analysis conducted on the allotment prior to the 2005 Complex fire revealed juniper and associated grassland as the dominant vegetation type, occupying 44% (24,382 acres) of the allotment. Other vegetation types and associated acreages identified within the allotment prior to the Complex fire include: riparian 583 acres, grassland 943 acres, desert grassland 2,374 acres, juniper/associated grassland mixed with desert scrub 383 acres, desert scrub 4,899 acres, woodland/juniper-associated grassland 4,478 acres, woodland 8,285 acres (Ambos 1999).

The allotment provides habitat for many species and has made substantial recovery from fire effects, with exception of desert scrub. Upland and riparian habitats, perennial / ephemeral streams provide habitat for endangered and numerous sensitive species, in addition to potential Southwestern willow flycatcher *(Empidonax traillii extimus)* (flycatcher) habitat (Figure 3). The allotment is unique due to the presence of 17.5 miles of perennial streams and associated habitat (Figure 3). Seventeen plus miles of perennial streams within the allotment represent significant aquatic and riparian resources, especially when compared to other Tonto Forest allotments at similar elevations. Although other habitats are utilized by some species during portions of their life cycle, riparian and stream habitats provide key habitat for wildlife and aquatic species. Drought conditions continue, and have been experienced during the past 10 years on the allotment. As a result, riparian systems and associated streams have increased importance to wildlife to that of pre-drought conditions.

The Complex fire has since affected soil conditions on the Cartwright Allotment (Figure 2). The fire burned about 80% of the allotment, however about 64% of the burn was of low severity or was an underburn and thus had little impact on soil conditions. About 24% of the allotment experienced moderate burn severity, primarily in chaparral, juniper

woodlands, and semi-desert grasslands. Only a small portion of Sonoran Desert experienced anything other than low burn severity. It is estimated that, as a result of the fire, the amount of impaired soils have increased to about 24% of the allotment, while the unsatisfactory soils remain at 29%. The increase in impaired soils is the result of moderated burns on previously satisfactory soils. In some areas moderate burn severity occurred on unsatisfactory soils and the soil condition in these areas remained unchanged. In areas with moderate burn severity high soil erosion rates have occurred or may occur. Areas with low burn severity experienced only a small increase in erosion (Ambos 2006).

Soil conditions and erosion are key components to consider when assessing aquatic and terrestrial wildlife habitats. Low burn severity through the majority of the allotment has been reflected in significant recovery of the herbaceous and shrub components, which reduce erosion rates and sedimentation effects on aquatic systems. Aquatic and terrestrial species that occurred on the allotment, prior to the Complex fire, continue to occur.

Riparian & Water Resources

Riparian conditions on the allotment were impacted to varying degrees by the Complex fire. Upper Camp Creek above the summer homes and several tributaries to Camp Creek with minor riparian vegetation were burned. Cave Creek remained largely unburned, Seven Springs Wash burned in the dry upper reach but the lower reach with riparian vegetation was unburned. Lime Creek, Professor Creek, and most of Long Canyon were unburned. Field visits to Lime Creek, Cave Creek and Seven Springs during the summer of 2007 revealed healthy riparian conditions. Aquatic species experienced short term affects from ash flows, increased sedimentation and increased flows due to lack of ground cover. Surveys conducted by Arizona Game and Fish and Forest Service personnel in 2006 and 2007 revealed occurrences of native fishes and amphibians within Lime Creek, Seven Springs and Cave Creek (USFS 2007a). Stream banks, for the most part, have made significant improvement from past conditions due to increased establishment of riparian herbaceous and woody vegetation. Recreation impacts such as illegal motorized trails and illegal wood harvest have negatively impacted riparian development in the upper portions of Cave Creek.

Flooding of Seven Springs Wash caused a loss of riparian vegetation on the upper end of the riparian area and deposition of large amounts of sediment. Most of the reach from the springs downstream to Forest Road (FR) 24 southern road crossing contains bedrock, so was little affected. Downstream of the road crossing to the recreation site, most of the riparian vegetation was removed to protect the Civilian Conservation Corps built channel. However, flooding damaged the rock work of the channel and destroyed much of the concrete and asphalt at the picnic area.

The allotment has several perennial streams and numerous spring resources. The perennial streams and springs provide key habitat for a variety of wildlife species. Cave Creek is approximately 10 miles long, Lime Creek is ca. 6 miles long, Seven Springs is

ca. 1.2 miles in length, Camp Creek, is ca 0.1 mile long within the allotment, and Lime Cabin Spring is ca. 0.2 miles long (Figure 3).

Occupied habitat for topminnow and longfin dace *(Agosia chrysogaster)* (Figure 3) occurs approximately within a 2.5 mile section of Lime Creek from Lime Cabin Spring downstream. Topminnow previously stocked in Cave Creek have not been documented within the stream since 1992. Seven Springs provides occupied habitat for longfin dace. Cave Creek provides occupied habitat for longfin dace and speckled dace *(Rhinicthys osculus)* and approximately one mile of potential flycatcher habitat approximately ½ mile upstream and ½ mile downstream of Ashdale Administrative Site (Figure 3). Potential flycatcher habitat will be fenced to exclude livestock under all grazing alternatives (Figure 3). Additionally, fencing of other riparian zones, to exclude livestock, may occur if monitoring indicates riparian use guidelines are regularly exceeded.

Non-native fathead minnow *(Pimephales promelas)*, mosquito fish *(Gambusia affinis)*, and green sunfish (*Lepomis cyanellus)* occur in Cave Creek (Stout et al. 1970; Rinne 1975; USFS 1992; Young & Bettaso 1994; Weedman et al. 1996; Weedman & Young 1997; Calamusso 2007, Cantrell 2007). Non-native crayfish (*Orconectes sp.)* continue to occupy Seven Springs, Camp Creek and Cave Creek to the detriment of macroinvertebrates, native fish and water quality. The Cave Creek District has worked with volunteers in the past to reduce the numbers of crayfish in Cave Creek and Seven Springs. The intent was to determine if such efforts may reduce negative impacts from crayfish. It appeared that intense efforts to reduce crayfish resulted in short term, higher recruitment, of Sonoran mud turtles *(Kinosternon sonoriense)* and improved water quality.

Other wildlife that occur within the project area include but are not limited to: mule deer *(Odocoileus hemionus)*, Coues white-tailed deer *(Odocoileus virginianus couesi)*, mountain lion *(Felis concolor)*, peccary *(Pecari angulatus*), gray fox *(Urocyon cinereoargenteus)*, bobcat *(Lynx rufus)*, coyote *(Canis latrans)*, desert cottontail *(Sylvilagus audubonii)*, rock squirrel *(Citellus variegatus)*, ringtail *(Bassariscus astutus)*, raccoon *(Procyon lotor)*, skunk *(Mephitis sp.)*, Merriam chipmunk *(Eutamias merriami)*, pocket mice *(Perognathus sp.)*, kangaroo rat *(Dipodomys sp.)*, wood rat *(Neotoma sp.)*, harvest mice *(Reithrodontomys sp.)*, whiptail lizards *(Aspidoscelis sp.)*, Western banded gecko *(Coleonyx variegates)*, ornate tree lizard *(Ursosaurus ornatus)*, common side-blotched lizard *(Uta stansburiana)*, zebra-tailed lizard *(Callisaurus draconoides)*, desert spiny lizard *(Sceloporus magister)*, Clark's spiny lizard *(Sceloporus clarkii)*, Gila monster *(Heloderma suspectum)*, horned lizard *(Phrynosoma sp.)*, Sonoran mountain kingsnake *(Lampropeltis pyromelana)*, common kingsnake *(Lampropeltis getula)*, Sonoran coral snake *(Micruroides euryxanthus)*, variable sandsnake *(Chilomeniscus stramineus)*, long-nosed snake *(Rhinocheilus lecontei)*, groundsnake *(Sonora semiannulata)*, gophersnake *(Pituophis catenifer)*, coachwhip *(Masticophis flagellum)*, Western lyresnake *(Trimorphodon biscutatus)*, Western diamond-backed rattlesnake *(Cortalus atrox)*, Mojave rattlesnake *(Cortalus scutulatus)*, black-tailed rattlesnake *(Crotalus molossus)*, tiger rattlesnake *(Crotalus tigris)*, speckled rattlesnake *(Crotalus*

mitchellii), Arizona black rattlesnake *(Crotalus Cerberus)*, Sonoran desert toad *(Bufo alvarius)*, great plains toad *(Bufo cognatus)*, Woodhouse's toad *(Bufo woodhousii)*, red-spotted toad *(Bufo punctatus)*, and canyon treefrog *(Hyla arenicolor)*.

Threatened and Endangered species that are expected or known to occur on the allotment are shown in Table 1.

Table 1. Threatened & Endangered Species expected or known to occur on the Cartwright Allotment.

Federally Listed Threatened & Endangered Species	Listing Status	Project Area Status
Gila Topminnow (*Poeciliopsis occidentalis occidentalis*),	E	S
Southwestern Willow Flycatcher *(Empidonax traillii extimus)*	E	S/PH

Key:

E = Federally Listed as Endangered, under Endangered Species Act (ESA)

S = Species known to occur in the analysis area, or in the general vicinity of the area.

PH = Potential Habitat identified based upon species mobility and existing habitat characteristics.

The list was developed from personal knowledge of the area by the Cave Creek District biologist, the Forest Fisheries Biologist, District Records, Arizona Game & Fish Department (AGFD) Heritage Nongame Data Management System data base and input from AGFD non-game personnel.

The allotment provides suitable occupied habitat for topminnow within Lime Creek (Figure 3). Approximately one mile of Cave Creek, downstream from Seven Springs Picnic Area provides potential flycatcher habitat (Figure 3). Potential flycatcher habitat is characterized by existing multi-layered riparian vegetation, perennial flows or moist soils, low stream gradient (2% or less), and available flood plains and suitable substrate for establishment of additional riparian vegetation (Appendix 3). The portion of potential flycatcher habitat along Cave Creek is approximately within nine air miles of occupied flycatcher habitat in the upper portion of Horseshoe Reservoir. Lime Creek is within three air miles of occupied flycatcher habitat within the upper portion of Horseshoe Reservoir and portion of Verde River near Ister Flat.

Past grazing has impacted vegetation, most of which likely occurred in the past when the allotment was heavily stocked. Impacts will likely occur in areas favored by livestock. Most of the vegetation communities on gentler slopes show low species diversity, decreased plant vigor, and decreased forage production. Ambos reported (1999) most impacted areas occur on slopes less than 30% with the greatest impacts occurring on slopes less than 10%. On these areas, the canopy coverage of perennial grasses is typically less than 1/3 of the canopy that occurred before European settlement. In the

heavier used areas the canopy coverage is much less than this. Similarly, stream channels and riparian vegetation are degraded from historic livestock management (Johnson and Mason 1999).

Cattle grazing on this area predates the Forest Service, having been started by R. J. Cartwright in 1887 (Carlson 1989). Cattle numbers between 1909 and 1944 generally varied from 1,300 to 3,100 cows year long, with an average number of 700 yearlings carried over from January through May. Between 1945 and 1987, about 800 yearlong cows and 400 carry over yearlings were permitted. From 1988 through 1992 cattle numbers were gradually reduced to 490 yearlong cows and about one-half that number of yearlings for the 5-month period (Johnson and Mason 1999).

Currently, term permitted numbers are 400 adult cattle year long with an additional number of yearling cattle (progeny of the adult cattle and not a fixed number) carry-overs permitted from January 1 through May 31 of each year. Livestock are managed in two separate herds. The larger herd uses six pastures in the Cave/Camp Creek drainages in a deferred, rest rotation grazing system. The second herd uses three pastures in the Lime Creek drainage in a deferred rotation grazing system. The actual number of livestock on the allotment can change throughout the year due to purchases, sales, and deaths. Actual use increased from 7,805 Animal Unit Months (AUM) (see *Definitions*, Appendix 4) in 1980 to 11,016 AUM in 1987. Since then actual numbers have decreased to 5,974 AUM in 1999 (USFS 2000e). Livestock were removed from the allotment in 2001 due to poor forage conditions resulting from drought (USFS 2000a). Cattle were restocked into Humboldt pasture for a few months in 2005, and allowable use standards were applied. Livestock were removed from the allotment in 2005 due to Complex fire. Cattle have not been on the allotment from 2005 to present.

All grazing alternatives analyzed exclude the Lime Creek pastures (Long Canyon, Professor, Lime Creek and Lime Cabin Pastures) and is supported by the current permittee. Presence of topminnow within Lime Creek, proximity of occupied flycatcher habitat at Horseshoe Reservoir, steep topography, difficulty in managing and making pasture moves and the large quantity of fence requiring reconstruction / maintenance led the Forest Service and permittee to exclude the Lime Creek pastures from grazing.

ALTERNATIVES CONSIDERED

The proposed action is to provide grazing opportunities and improve or maintain range and watershed conditions on the Cartwright grazing allotment by employing conservative use (see *Definitions*, Appendix 4) and deferred or rest-rotation strategies. The objective of conservative use is to manage grazed vegetation for the maintenance of good to excellent and enhancement of poor to fair watersheds and wildlife habitat. This Biological Assessment will examine the effects of managing for conservative use on listed and sensitive species. An adaptive management approach will be adopted as outlined in Chapter 90 of FSH 2209.13 to work toward this objective (Appendix 1).

Holechek et al. (1999, 2004) supports the concept that conservative use with planned recovery rest strategies will allow for sustaining or improving rangelands and watersheds. Monitoring must occur to ensure conservative use levels are improving range trend if it is downward or maintaining if upward. Precipitation patterns are an important consideration for both long- and short-term goals. Rainfall on the allotment varies and may be highly erratic both within and between years. Precipitation on the allotment is bimodal, as are growing seasons, with intense, short duration, convective monsoon storms during July to September, and more sustained cyclonic events during winter. Mean annual precipitation at Ashdale is approximately 15", and mean annual air temperature is about 60° F. About 55% of the annual precipitation occurs between October and March (Sellers et al. 1985). The maintenance of residual biomass to ensure plant vigor and ground cover on all grazed rangeland is critical for wildlife habitat and watershed protection throughout the year.

From a long-term perspective, conservative use will be achieved by maintaining forage utilization on key forage species (see *Definitions,* Appendix 4) between 30 and 40% or less of annual forage production for herbaceous perennials and 50% of woody browse. Measures are by weight as measured at the end of the growing season. These objectives are based on averages over time, entire pastures, and total forage production (Smith et al., 2005). If utilization levels exceed desired levels, a change in management practices may be warranted. Management actions include but are not limited to adjustments of timing, intensity, frequency, and duration of grazing (FSH 2209.13 - Chapter 90).

From a short-term (within-year) perspective, wildlife habitat and watershed condition may be gauged by monitoring seasonal utilization (see *Definitions,* Appendix 4) on key forage species during the grazing period. Seasonal utilization is important because the end of the growing season is not well-defined for all plant communities on the allotment. The warm climate and mild winters provide an opportunity for yearlong or multiple growing seasons for many species. Therefore, the growing periods for plants are often more related to variable precipitation than seasons of the year. Additionally, seasonal monitoring provides an opportunity to assess range condition during periods of use when listed species are most likely to be adversely affected by grazing activities. Smith et al. (2005) points out that "seasonal utilization may be an important factor in deciding when to move cattle out of a particular pasture and utilization levels may be the primary influence when adjusting numbers for next year." Flexibility to adjust livestock numbers throughout the season or year is essential to a successful adaptive management strategy. Smith et al. (2005) notes that seasonal utilization data can be used as a guideline for moving livestock within an allotment with due consideration to weather conditions and the availability of forage and water in pastures scheduled for use during the same grazing season.

Control features such as fences and cattle guards are designed to hold permitted livestock within the appropriate pastures. Livestock may occasionally access areas that are outside the area of planned use. In such cases, the FS will work with the permittee to assist in correcting the situation through inspections and regular visits to occupied pastures and adjacent areas.

Utilization Levels / Controls Common to all Grazing Alternatives.

Planned livestock use for all grazing alternatives is conservative use (30-40% of current year's growth on herbaceous material and 50% or less on browse material in the uplands). Critical riparian areas achieve utilization that will not exceed 20 % of the current year's growth by volume of woody species. Limiting use to < 50% of terminal leaders on the top 1/3 of the plans that are accessible to livestock (< 6 feet tall) is used as a surrogate guideline because use by volume is extremely difficult to measure where use on terminal leaders is quick and repeatable. Use of 50% of terminal leaders on the top 1/3 of plants is equivalent to approximately 20% of annual growth by volume. Use on deer grass is limited to less than 40% of plant species biomass. On emergent species (rushes, sedges, cattails, horsetails) a stubble height of six to eight inches will be maintained during the grazing period (USFS 2007b). Green line / stream bank alteration will be measured as an annual indicator and to help determine long term trend. Range fencing or other devices to contain livestock to assigned pastures will be in place prior to grazing.

Alternative A -No Action/No Grazing.

Under this alternative, grazing would not be authorized and use of the allotment by domestic livestock would be discontinued. Permittees would be given one year from the date of the decision to remove livestock from the allotment. Existing structural improvements would remain in place but would not be maintained. Improvements contributing to resource protection or enhancement, such as water developments important for wildlife, would be maintained where feasible using other program funds. Periodic inspection of structural improvements would be used to determine whether maintenance or removal is needed. Removal or maintenance of improvements would be authorized by a separate decision. Where necessary, maintenance of allotment boundary fences would be reassigned to adjacent permittees with the understanding that livestock are to be kept off Cartwright Allotment.

Alternative B - Proposed Action

The proposed action is to continue to authorize livestock grazing on the Cartwright Allotment consistent with forest plan standards, management prescriptions and monitoring requirements (Table 2).

Duration and timing of grazing. Use on the allotment will be authorized year-round using rotational grazing. Grazing management will be designed to insure that pastures receive periodic growing season rest or deferment in order to provide for grazed plant recovery. The sequence and timing of pasture moves will be based on monitoring of available water, livestock nutritional needs, ecological condition, and forage utilization. The 4 pastures connected with the second herd will be removed from grazing: Professor, Lime Creek, Lime Cabin Spring and Long Canyon Pastures.

Actions required to implement the decision. Grazing authorizations will be implemented through the following administrative actions.

- A new ten-year term grazing permit would be issued for the following numbers and under the following terms and conditions:
- A new allotment management plan (AMP) would be developed and will become part of Part 3 of the grazing permit issued under the proposed action. The AMP would incorporate an adaptive management strategy (see below). Using adaptive management, specific numbers of livestock would be set each year based on resource conditions and management objectives for the allotments. Pasture rotations will be planned at the beginning of each grazing year and will be continually modified in response to changing resource conditions with the objective of not grazing any one pasture during consecutive growing seasons.
- The proposed action would permit 400 head of adult cattle (bulls, cows, cow/calf) yearlong, progeny of the adult cattle grazing at that time as yearling carry-over from January 1 to May 31 of each year, and 10 horses to be utilized in the grazing operation. An adaptive management approach would implement a 6-pasture, deferred-rotation grazing strategy.
- Due to drought and fire effects, initial stocking will authorize a reduced number of cattle, approximately 200 head of livestock for the first year. At the end of a year's grazing rotation, monitoring data collected throughout the grazing period will be used to reassess and determine if a change in numbers or rotation should be made. If monitoring indicates modifications need to be made, duration, timing, livestock numbers, frequency and/or intensity of grazing may be adjusted.
- Cave Creek will be fenced as per Table 5. Other riparian areas may fenced to exclude livestock based upon monitoring results.

Typically, improvements are funded on a cost-share basis with the Forest Service providing materials and the permittee providing the labor to construct or install the improvement. Forest Service funding for all of the improvements is not currently available and funding constraints will likely require the projects to be completed over a period of years. The permittee has been notified of funding constraints and encouraged to pursue alternative sources of funding if they wish to expedite completion of the developments. Currently the permittee has an aggressive program of reconstruction of burned fences (resulting from the 2005 Complex fire). The Forest Service has provided some fencing materials and the permittee is pursuing funding from the Environmental Quality Incentive Programs (EQIP) for some of the fences. However, the current funding does not cover all of the burned fences.

Table 2. Proposed Grazing Management.

Allotment	Grazing System	Cattle Yearlong	Comments
Cartwright	6-pasture deferred rotation	400 adult with yearling progeny from Jan. 1 – May 31 10 horses	Reduced from 2001 permit of 640 adults yearlong with 336 yearlings from Jan. 1 - May 31 Removes second herd and 4 pastures: Professor, Lime Creek, Lime Cabin Spring and Long Canyon Pasture.

Alternative C - Proposed Action with Reduced Numbers and a Designated Grassbank Pasture.

This alternative is also to continue to authorize livestock grazing on the Cartwright Allotment consistent with forest plan standards, management prescriptions and monitoring requirements (Table 3). It was developed in cooperation with the current permittee. Alternative C is similar to Alternative 2 with two differences.

- 6L Pasture will remain in the grazing allotment. However, the pasture will be set aside as a Grassbank Pasture. This will make the alternative a 5-pasture deferred rotation system. If resource concerns or other needs result in the necessity for an extra pasture in any given year, the permittee will use 6L Pasture at his discretion. The range improvements will need to be maintained before the pasture is grazed.
- The permit numbers will be reduced to 350 adult cattle yearlong with yearling progeny from January 1 through May 31. Fifty fewer cattle is a reduction in numbers due to elimination of the herd on the Professor, Lime Creek and Long Canyon Pastures and incorporation of the Grassbank pasture. The permit will also include 10 horses yearlong.

Table 3. Proposed Alternative with Reduced Numbers and Pastures Grazing Management.

Allotment	Grazing System	Cattle Yearlong	Comments
Cartwright	5-pasture deferred rotation	350 adult with yearling progeny; 10 horses	Reduced from proposed 400 yearlong and 10 horses; also designates 6L Pasture as a Grassbank pasture

Alternative D

This alternative is to continue to authorize livestock grazing on the Cartwright Allotment consistent with Forest Plan standards, Management Prescriptions and monitoring requirements but using a seasonal grazing strategy shown in Table 4. It would authorize the same number of animal unit months (AUM's) for a six month cool season grazing period.

Table 4. Proposed Alternative, Seasonal Grazing with Reduced Numbers and Pastures Grazing Management.

Allotment	Grazing System	Cattle Yearlong	Comments
Cartwright	5-pasture deferred rotation	5544 AUM's (924 adults or 700 cow/calfs or 1320 yearlings) 10 horses	Keeps 6L as a Grassbank Pasture. Changes cow/calf year long to AUM's for six months from October 1 thru February 28.

Table 5. Description and Objective for Range Improvements.

Pasture Name	Proposed Improvement	Objective
Maverick	Rebuild burned Camp Creek exclosure.	Continue exclosure area for studies; improve riparian condition and livestock distribution by excluding livestock use in riparian area and moving cattle into the uplands; provide double fence separating livestock from Camp Creek.
Quien Sabe	Fence one mile on south side of Cave Creek and tie into existing fence on north side of creek.	Improve livestock distribution and improve riparian condition by removing livestock use in riparian area (potential flycatcher habitat) and moving cattle into the uplands..

SPECIES IDENTIFICATION

Lists of species that are listed as threatened, endangered, or proposed under the Endangered Species Act were consulted (USFWS 2007). Additionally, monitoring and sighting information and other literature was reviewed to add appropriate species to the list.

SPECIES EVALUATIONS

Gila topminnow

Gila topminnow was listed as endangered in 1967 (USFWS 1967). Critical habitat is not designated for Gila topminnow (USFWS 1984). Reasons for its endangerment include fragmentation and loss of habitat caused by dewatering of aquatic habitats, habitat modification caused by cattle grazing among others, and introduction of nonnative predacious and competitive fishes (USFWS 1984). It was considered one of the commonest fish in the southern Colorado River system (Hubbs and Miller 1941)in the mid-20th century, but now is restricted to less than 20 small springs and streams (Weedman and Young 1997). In the 1980's, recovery efforts focused on reestablishing it in isolated springs, seeps, tanks, and other small aquatic habitats in the Gila River drainage. Of the ca. 176 sites stocked, it remained extant in eighteen as of 1997 (Weedman and Young 1997). During the spring of 2006 Tonto Forest personnel in cooperation with AGFD and the U. S. Fish and Wildlife Service successfully restocked the species into Dutchman Grave Spring, after the species was eliminated due to ash flows and increased surface runoff following the 2004 Willow Fire. The TNF has recently made significant progress introducing the species on other Districts on the Forest.

Topminnow were stocked into Lime Cabin Spring in 1982. A 1983 survey reported no topminnow present at the spring. In 1996, a fishery survey in Lime Creek from near Horseshoe Reservoir to Lime Cabin Spring reported topminnow occupied about 2.5 miles of Lime Creek downstream from the spring, but none in the spring stream. Longfin dace are also present throughout Lime Creek, and green sunfish near Horseshoe Reservoir (Weedman and Young 1997). During the summer of 2005 topminnow in Lime Creek were successfully salvaged during the Complex fire(USFS 2007a). Topminnow continued to survive in Lime Creek after the Complex fire. The fire removed portions of vegetation in the uplands which resulted in increased surface flows, flooding and deposition of sand, decomposed granite and ash within Lime Creek. Surveys conducted by Forest Service and AGFD personnel in 2006 and 2007 confirmed presence of topminnow and longfin dace within Lime Creek (USFS 2007a). Camp Creek was stocked with topminnow in 1975, but they subsequently disappeared, perhaps due to flooding (Weedman and Young 1997). There is no critical habitat designated for Gila topminnow.

Topminnow is an annual species (i.e., <1 year life span) whose populations wax and wane seasonally with winter being a time of very low numbers, and fluctuate in

abundance and distribution over time periods lasting from years to decades in accordance with drought and wet conditions.

Lack of adequate cover due to deteriorated aquatic habitat conditions is probably the main reason that the species has not been able to maintain populations during extreme winter flooding (Minckley 1999). Habitat requirements of topminnow are fairly broad; it prefers shallow, warm and fairly quiet waters, but can adjust to a rather wide range, living in quiet to moderate currents, depths to three feet, and water temperatures from constant 80° F springs to streams fluctuating from 43-99° F. The species lives in a wide variety of water types; springs, cienegas, marshes, permanent or interrupted streams, and formerly along the edges of large rivers. Preferred habitat contains dense mats of algae and debris, usually along stream margins or below riffles, with sandy substrates sometimes covered with organic mud and debris.

Topminnow food habits are generalized and include bottom debris, vegetative materials, amphipod crustaceans and insect larvae, including mosquitoes.

Along with much of the native southwestern fish fauna, range and abundance of topminnow have been declining since the late 1800's. Damming and diversion of streams, channelization and arroyo-cutting, and groundwater pumping have altered the natural aquatic ecosystem to such an extent that little habitat is left for the species. Large streams that used to be stable and had extensive lagoons, marshes and backwaters, and springs and cienegas on the smaller tributaries, are now intermittent, deeply cut, broad sandy washes subject to severe flooding. The loss of aquatic habitats due to human activity dramatically reduced the amount of habitat available for topminnow, however it persisted and was abundant through the 1930's.

In 1926 western mosquitofish was introduced into Arizona from the southeastern United States, and has since spread rapidly throughout the southwest. Western mosquitofish occupies the same habitat as Gila topminnow, thus it came into direct contact with topminnow, and its aggressive, predatory nature led to sudden declines in the populations of topminnow.

Data Sources. Survey data collected by Forest, and AGFD personnel; Heritage Data Management System; and field surveys / evaluations by Forest personnel.

Analysis of Effects.

Lime Creek will not be grazed under implementation of any of the alternatives considered. The Humboldt pasture is the only pasture that could be grazed on the allotment that is within the watershed of the lower portions of Lime Creek. Topminnow primarily occurs from approximately Lime Cabin downstream ca 2.5 miles. Lime Creek maintains perennial flow downstream of where the species has recently been documented. Therefore, the species could exist within the watershed of the Humboldt pasture. Recovery of upland vegetation on the eastern portion of the Humboldt pasture following the Complex fire has been significant. Riparian vegetation throughout the majority of Lime Creek was unburned and provides some protection from siltation and

provides additional stability to maintain stream banks. It is expected that Lime Creek aquatic and terrestrial environments will continue to improve in the absence of grazing. Ambos (2007) identified soil conditions within the Humboldt pasture, within the Lime Creek watershed as satisfactory.

For all grazing alternatives utilization limits would be applied and monitoring would occur in the uplands and in riparian areas throughout the grazing period. Trigger points would be employed in order to provide ample time to move livestock prior to utilization limits being reached or exceeded.

Alternative A -No Action/No Grazing - Selection of the no grazing alternative is expected to increase habitat potential for threatened and endangered species associated with riparian areas and stream environments. Topminnow habitat would continue to improve under this alternative since grazing would not occur within the Lime Creek pastures. The effect will promote improved riparian habitat, water quality, aquatic habitat and upland conditions in the Lime Creek pastures. Although factors other than livestock grazing play a role in the quality of the habitat for species on the allotment (such as fire, flooding regime, recreational use, etc.), it is anticipated that removal of all grazing from these areas will result in greater improvement of riparian areas to that of the other alternatives. All wildlife populations in the area, including threatened and endangered species dependant on riparian habitat would benefit from improved habitat conditions. Potential habitat for threatened or endangered species should improve, which may lead to suitable habitat for species.

Alternative B – Proposed Action - This alternative offers the least benefit to TES species as compared to the other alternatives due to increased stocking rates, year-long use of the allotment and regular use of the 6L pasture. Portions of Cave Creek and upper Seven Springs will be exposed to more direct and indirect effects, from livestock under implementation of this alternative when compared to the other alternatives, although use levels are the same. Selection of this alternative is expected to provide the least amount of protection for threatened and endangered species associated with riparian areas and aquatic habitats due to increased stocking rates, year-long use of the allotment and regular use of the 6L pasture.

Lime Creek, nor any pastures that contain Lime Creek will be grazed under any of the alternatives. The effect will promote improved riparian, water quality, aquatic habitat and upland conditions. Although other factors other than livestock grazing play a role in the quality of the habitat for species on the allotment (such as flooding regime, recreational use, etc.), it is anticipated that implementation of this alternative will result in fewer improvements to aquatic and riparian areas to that of the other alternatives due to increased stocking rates, year-long use of the allotment and regular use of the 6L pasture.

The Lime Creek pastures will not be grazed under implementation of any of the alternatives. Topminnow habitat within Lime Creek is expected to improve under implementation of alternative B but to a lesser degree than alternatives A, C or D may provide due to higher numbers of livestock permitted, livestock use of other riparian

areas through the growing season, year-long use of the allotment and regular use of the 6L pasture.

Alternative C - Proposed Action with Reduced Numbers and a Designated Grassbank Pasture- This alternative is similar to Alternative B with two differences. The 6L pasture will remain in the allotment and set aside as a grass bank pasture, and permit numbers will be reduced to 350 adult cattle year long. Upland and riparian areas impacted by the Cave Creek Complex fire are likely to recover quicker than under implementation of Alternative B, due to a slight reduction in livestock numbers, and setting the 6L pasture aside as a grass bank which contains Sonoran desert and the lower portion of Cave Creek.

This alternative offers greater benefits to TES species as compared to Alternative B due to slightly reduced stocking rate and addition of the grass bank. Establishment of a grass bank in the 6L pasture, and infrequent use, will minimize direct and indirect effects to uplands and riparian areas associated with the lower portion of Cave Creek. Portions of Cave Creek and upper Seven Springs will be exposed to direct and indirect effects from livestock under implementation of this alternative, although at slightly reduced stocking rates than Alternative B. This alternative does not afford the level of protection for threatened and endangered species associated with riparian and aquatic habitats, as compared to Alternatives A or D due to either no grazing or seasonal use.

The Lime Creek pastures will not be grazed under implementation of any of the alternatives. Portions of other stream habitats that may provide future topminnow habitat will not improve to the degree alternatives A, or D would permit due to higher numbers of livestock permitted under this alternative and livestock use of riparian areas through the growing season.

Alternative D - This alternative would utilize a seasonal grazing strategy, set aside a grass bank and utilize the same animal unit months as in Alternative C, but would authorize grazing for six months during the cooler season.

This alternative offers greater benefit to TES species as compared to Alternatives B or C. Establishment of a grass bank in the 6L pasture will minimize direct and indirect effects to uplands and riparian areas associated with the lower portion of Cave Creek. Portions of Cave Creek and upper Seven Springs will be exposed to direct and indirect effects, from livestock under implementation of this alternative, although with a greater likelihood of keeping livestock utilization within established limits due to cool season use. Stream habitats that may provide habitat for topminnow will improve to a greater degree under implementation of alternative D than that of alternatives B, or C due to seasonal use outside of the growing season, and better distribution of yearlings in the uplands, and less time spent within riparian areas, and establishment of 6L pasture as a grass bank.

Using the March 15, 2005 Framework, a **No Effect** determination would require meeting

one of the following criteria:

1. *The species or critical habitat is not present in the action area.*
2. *Livestock grazing in the action area will be excluded so that there is no species exposure and thus no response. Furthermore, there will be no indirect effects such as:*
    a. *Sedimentation (sediment traps occur between the allotment and TEP species habitat),*
    b. *Evidence of active erosion caused by livestock or livestock management activities*

Criterion one will not be met since topminnow occur in Lime Creek. Criterion two will be met since Lime Creek will be excluded from grazing, eliminating species exposure and thus no response. Indirect effects such as sedimentation will be avoided due to established vegetation within the Lime Creek watershed and existing riparian habitat that remained largely unburned after the Complex fire, which will provide additional protection from sedimentation and erosion. Fencing of the eastern portion of the Humboldt pasture is such that run-off is predominately to the west of the eastern portion of the pasture. Since the fence is, for the most part, on the west side of ridgeline, there is additional protection to Lime Creek from the Humboldt pasture. The majority of the Humboldt pasture watershed influences areas to the west of Humboldt due to topography (Figure 1). A small portion of the eastern edge of the Humboldt pasture watershed has potential to influence Lime Creek indirectly. Effects will be insignificant or discountable due to existing ground cover and vegetation that has re-established in the uplands within the Humboldt pasture, and the western portion of the Lime Creek pasture, which will reduce possible sedimentation / erosion effects and increase potential for infiltration of surface flows. The Humboldt pasture soil conditions within the Lime Creek watershed are generally in satisfactory condition (Ambos 2007). Additionally, implementation of conservative grazing use levels Holechek et al. (1999, 2004) supports the concept that conservative use with planned recovery rest strategies will allow for sustaining or improving rangelands and watersheds.

Determination of Effects. It is my determination based on the Framework, that Alternatives B, C, or D for grazing management on the Cartwright Allotment will have "No Effect" on the Gila topminnow or its habitat. This is based upon exclusion of livestock from occupied habitat within Lime Creek, satisfactory soil condition within Humboldt pasture and implementation of conservative use.

It is my determination that Alternative A for grazing management on the Cartwright Allotment would result in a "No Effect" determination the Gila topminnow or its habitat since grazing would be discontinued.

Southwestern Willow Flycatcher

The southwestern willow flycatcher is a small Empidonax flycatcher identified in the field by its song. It is a neotropical migrant that breeds in the southwestern United States and winters in Central America. It is an insectivore feeding within and above dense riparian vegetation. Nesting occurs in dense, thicket-like, multi-storied riparian vegetation of native and/or exotic species. It prefers riparian areas associated with stream gradients of less than one percent with backwaters, pools, beaver ponds or areas that contain saturated soils during the breeding season. Habitat patches are generally larger than one acre in size although the species has been found in patches as small as ¼ acre. Large patches with sufficient width to provide interior or non-edge habitat are preferred. The primary nesting season occurs from April through July.

Threats to the species include loss of breeding habitat due to urban, recreational, and agricultural development; water diversion and recreational uses; and hydrological changes resulting from these and other land uses. Brood parasitism by brown-headed cowbirds, pesticide contamination, predation and replacement of native riparian vegetation by exotic tamarisk are also identified threats.

On the Tonto National Forest, occupied, suitable and potential habitat occurs along major drainages throughout the Forest below 3500 feet elevation. The Verde River from the confluence of the East Verde to the mouth of Horseshoe Reservoir, and downstream of Horseshoe Dam ca. 4.1 river miles to the river gauge is designated as Critical Habitat for the species. Occupied habitat occurs at three locations: 1) Roosevelt Lake at the Salt River inflow; 2) Roosevelt Lake at the Tonto Creek inflow; and 3) Ister Flat (Horseshoe Reservoir at the Verde River inflow) and the upper portion of Horseshoe Reservoir. In addition to identification and protection of occupied and designated critical habitat, the Forest has developed procedures for identification of potential habitat (Appendix 3).

Flycatcher surveys have been conducted on the Verde River since 1993. Flycatchers were first identified at Ister Flat during AGFD surveys in 1994. Forest biologists, Lauren Turner and Beth Humphrey, identified flycatcher occurrence at Ister Flat during the 1996 breeding season and found a possible nest. Annual surveys at Ister Flat in 1997 and 1998, resulted in detection of two territories each year. One migrant flycatcher was detected at Ister Flat during the first survey period in 2000. No detections were made during the following two survey periods.

Additional surveys on the Verde River from Childs to Sheep Bridge have been conducted by the Forest beginning in 1998 through 2006, although they have not occurred during all three survey periods. One bird responded at OK Flat, below Red Creek, during the May 1999 survey, but did not respond during the June survey. Two migrant flycatchers were detected near Canoe Mesa, on the Verde River in 2004 during the first survey period. The Verde was not surveyed during the last two survey periods in 2004 due to low flows. Surveys conducted at Horseshoe Reservoir from 2000-2007 resulted in total detections of 141 adults, 88 territories, and 56 pairs of flycatchers (USFS 2007c). Nest monitoring was

not conducted regularly therefore little data exists related to flycatchers fledged in the Horseshoe area.

Riparian vegetation along the Verde River on the Forest is recovering from major flood events in 1993 and 1995. The 2004 Willow Fire removed significant portions of vegetation in the Verde River watershed and resulted in unusually high flows due to increased surface runoff, which removed additional riparian vegetation along the Verde River. Suitable habitat is generally patchy, although larger patches of suitable habitat exist above and below Red Creek, at OK Flat and at a few other locations along the river. Suitable and/or potential habitat is found along the entire length of the Verde River upstream from Ister Flat. Surveys conducted near Mesquite Campground, downstream of Horseshoe Dam during 2002, 2003 and 2004 resulted in a total of 13 adults, 7 territories and 5 pairs of flycatchers (USFS 2007c).

Southwestern willow flycatcher habitat is found within or in proximity to the Cartwright Allotment. Occupied flycatcher habitat at Horseshoe Reservoir is within 3 miles of the Lime Creek pastures, which will not be grazed under any of the alternatives. Occupied flycatcher habitat at Horseshoe Reservoir is within nine air miles of potential flycatcher habitat along approximately one mile of Cave Creek. Potential flycatcher habitat also exists along Camp Creek south of the allotment boundary.

Data Sources. Survey data and evaluations by Forest personnel; Bureau of Reclamation personnel; Salt River Project contractors; AGFD personnel; annual flycatcher reports by AGFD; Heritage Data Management System.

Analysis of Effects. Occupied habitat at Horseshoe Reservoir and detections of migrants on other portions of the Verde River indicate that the species has expanded its range in the area during the past several years. No flycatcher surveys have been conducted on the allotment due to limited personnel, limited funding and prioritization of surveys through higher quality habitat adjacent to the Verde River.

The Lime Creek pastures have been eliminated from grazing under all alternatives. Potential flycatcher habitat identified through approximately one mile of Cave Creek will be fenced (if grazing occurs) on the south side of the creek and tie into existing fence on the north side of Cave Creek. Thus, direct effects from livestock will be eliminated through the portion of Cave Creek potential habitat. It is unlikely that flycatchers utilize the potential habitat adjacent to Cave Creek for breeding or nesting since the riparian habitat currently lacks the required density and is currently deficient in providing the multi-storied structure associated with suitable habitat. It is conceivable that migrant flycatchers may use the potential habitat adjacent to Cave Creek. Occupied habitat at Horseshoe Reservoir exists within nine miles of Cave Creek and flycatchers could utilize Cave Creek during migration. Additionally, Camp Creek, a tributary of the Verde River, may provide a migration corridor in the vicinity of Cave Creek. If migrant flycatchers travel north up Camp Creek, it is reasonable to consider that the species could continue north to Cave Creek. Potential habitat also occurs through portions of Camp Creek, south of the allotment boundary.

For all grazing alternatives utilization limits would be applied and monitoring would occur in the uplands and in riparian areas throughout the grazing period. Trigger points would be employed in order to provide ample time to move livestock prior to utilization limits being reached or exceeded.

Alternative A -No Action/No Grazing - Selection of the no grazing alternative is expected to increase habitat potential for threatened and endangered species associated with riparian areas. Identified potential flycatcher habitat would continue to improve under this alternative since grazing would not occur within potential habitat or within the watershed of potential habitat. Lime Creek will not be grazed under any of the alternatives. The effect will promote improved riparian habitat, water quality, aquatic habitat and upland conditions in the Lime Creek pastures. Although factors other than livestock grazing play a role in the quality of the habitat for species on the allotment (such as fire, flooding regime, recreational use, etc.), it is anticipated that removal of all grazing from these areas will result in greater improvement of riparian areas to that of the other alternatives. All wildlife populations in the area, including threatened and endangered species dependant on riparian habitat would benefit from improved habitat conditions. Potential habitat for threatened or endangered species should improve, which may lead to suitable habitat for species.

Alternative B – Proposed Action - This alternative offers the least benefit to TES species as compared to the other alternatives due to increased stocking rates, year-long use of the allotment and regular use of the 6L pasture. Portions of Cave Creek and upper Seven Springs will be exposed to more direct and indirect effects, from livestock under implementation of this alternative when compared to the other alternatives, although use levels are the same. Selection of this alternative is expected to provide the least amount of protection for threatened and endangered species associated with riparian areas due to increased stocking rates, year-long use of the allotment and regular use of the 6L pasture.

The Lime Creek pastures will not be grazed under implementation of any of the alternatives. Potential habitat identified for flycatchers will be fenced to remove direct livestock affects, resulting in similar recovery as Alternative A, C, and D. Portions of other riparian habitat that my develop into potential flycatcher habitat will not improve to the degree alternatives A, C, or D would permit due to higher numbers of livestock permitted, livestock use of riparian areas through the growing season, year-long use of the allotment and regular use of the 6L pasture.

Alternative C - Proposed Action with Reduced Numbers and a Designated Grassbank Pasture- This alternative is similar to Alternative B with two differences. The 6L pasture will remain in the allotment and set aside as a grass bank pasture, and permit numbers will be reduced to 350 adult cattle year long. Upland and riparian areas impacted by the Cave Creek Complex fire are likely to recover quicker than under implementation of Alternative B, due to a slight reduction in livestock numbers, and

setting the 6L pasture aside as a grass bank which contains Sonoran desert and the lower portion of Cave Creek.

This alternative offers greater benefits to TES species as compared to Alternative B due to the slightly reduced stocking rate and addition of the grass bank. Establishment of a grass bank in the 6L pasture, and infrequent use, will minimize direct and indirect effects to uplands and riparian areas associated with the lower portion of Cave Creek. Portions of Cave Creek and upper Seven Springs will be exposed to direct and indirect effects from livestock under implementation of this alternative, although at slightly reduced stocking rates than Alternative B. This alternative does not afford the level of protection for threatened and endangered species associated with riparian areas, as compared to Alternatives A or D due to either no grazing or seasonal use.

Potential habitat identified for flycatchers will be fenced and remove direct livestock effects, resulting in similar recovery as Alternatives A, C, and D. Portions of other riparian habitat that may develop into potential flycatcher habitat will not improve to the degree alternatives A, or D would permit due to higher numbers of livestock permitted under this alternative and livestock use of riparian areas through the growing season.

Alternative D - This alternative would utilize a seasonal grazing strategy, set aside a grass bank and utilize the same animal unit months as in Alternative C, but would authorize grazing for six months during the cooler season.

This alternative offers greater benefit to TES species as compared to Alternatives B or C. Establishment of a grass bank in the 6L pasture will minimize direct and indirect effects to uplands and riparian areas associated with the lower portion of Cave Creek. Portions of Cave Creek and upper Seven Springs will be exposed to direct and indirect effects, from livestock under implementation of this alternative, although with a greater likelihood of keeping livestock utilization within established limits due to cool season use. Potential habitat identified for flycatchers will be fenced and remove direct livestock affects to potential habitat, resulting in similar recovery as Alternatives A, B, and C. Portions of other riparian habitat that may develop into potential flycatcher habitat will improve to a greater degree than that of alternatives B, or C due to seasonal use outside of the growing season, and better distribution of yearlings in the uplands, and less time spent within riparian areas, and establishment of 6L pasture as a grass bank.

Using the March 15, 2005 Framework, a **No Effect** determination would require the following conditions:

1. Southwestern willow flycatchers are not present within the action area during any time of the year.

Effects Analysis: Flycatchers utilizing Horseshoe are within 3 miles of the allotment, and within nine miles of Cave Creek. Surveys have not been conducted for the species on the allotment. Migrant flycatchers may utilize Cave Creek or Camp Creek due to

proximity to Horseshoe and the Verde River. Because flycatchers may be present within the action area, any time of the year, none of the grazing alternatives meet the conditions for a No Effect Determination. Alternative A, No Grazing would meet the criteria for a No Effect Determination.

A **May Affect, Not Likely to Adversely Affect** determination would require the following conditions:

1. Grazing activities in the action area, do not measurably or detectably reduce the suitability or regeneration of southwestern willow flycatcher habitat,
2. Indirect effects occurring within the action area resulting from livestock grazing on the allotment are determined to be insignificant or discountable,
3. Livestock grazing should comport with or be more conservative than the descriptions provided in Table 2, Appendix G or the 2002 USFWS Southwestern Willow Flycatcher Final Recovery Plan.

Criterion one will be met since potential habitat will be fenced to exclude livestock and thus eliminate direct effects to habitat. Criterion two will be met due to implementation of conservative grazing use levels. Holechek et al. (1999, 2004) supports the concept that conservative use with planned recovery rest strategies will allow for sustaining or improving rangelands and watersheds. Criterion three will be met since potential habitat will be fenced, upland use by livestock will be limited to conservative use, average utilization of palatable perennial grasses and grass-like plants will not exceed 30-40%. Monitoring of upland and riparian use will occur throughout the grazing period and trigger points will be utilized.

Determination of Effects. It is my determination based on the Framework, that Alternatives B, C, or D for grazing management on the Cartwright Allotment "May affect, not likely to adversely affect" the Southwestern willow flycatcher or its habitat. This is based upon the exclusion of livestock from potential habitat and implementation of conservative use.

It is my determination that Alternative A for grazing management on the Cartwright Allotment would result in a "No Effect" determination for the Southwestern willow flycatcher since grazing would be discontinued.

Cumulative Effects Common to All Alternatives. Cumulative effects include the direct and indirect effects of the proposed action and alternatives when added to all past, present and reasonably foreseeable future actions.

Congregation of livestock (herding, stock tank areas, trailering, loading/unloading, maintenance of livestock facilities, branding) may contribute to cumulative effects to wildlife or associated habitat, when considering grazing alternatives. Effects may include removal of vegetation, dust accumulation, noise, avoidance of areas by wildlife, soil compaction, and watershed effects. Impacts may vary depending upon circumstances

associated with the cumulative effects.

Motorized / non-motorized recreation, and illegal cross country travel negatively impact wildlife resources and or habitat through removal, destruction or degradation of herbaceous / woody vegetation and aquatic emergent vegetation and associated stream habitats. Traffic patterns often dictate a persistent dust cloud, vehicle noise and physical presence, especially on weekends and holidays, along Forest Road (FR) 24 and FR 41. Traffic impacts to wildlife may be realized by avoidance of the area by some wildlife due to dust and or presence of vehicles and people, wildlife vehicle collisions, and poaching from vehicles. Secondary roads may have similar impacts to wildlife, although traffic volume and speed will generally be lower, and impacts to wildlife will exist but at reduced levels due to lower traffic volume.

Illegal cross country travel also has negative effects to wildlife and habitat through proliferation of wildcat trails, use of motor vehicles through washes, riparian corridors and uplands. Wildlife habitat becomes fragmented and often damaged for the long term, as a result of illegal cross country motorized travel. The Travel Management Rule is intended to analyze alternate motorized routes in order to provide access and a recreation experience sufficient so vehicle operators no longer feel compelled to travel off established roads or trails. Once routes are established, maps will be available to the public and modified as needed to reflect any changes. Enforcement of the Travel Management Rule is imperative to assure compliance. Funding and personnel dedicated to enforcement of travel management will be required due to short staffing on the Cave Creek District.

Presence of people and associated noise and disturbance of habitat in dispersed areas, on non-motorized trails and within campgrounds, has negative affects on wildlife. Impacts to wildlife include total avoidance of areas that regularly receive high recreational use, habitat destruction or modification and avoidance of critical riparian areas where recreation infrastructure (campgrounds, picnic areas, motorized and non-motorized trails) exists and encourages year-round recreation use.

Equestrian use may also negatively affect wildlife by presence of horse and rider and eventual avoidance of such areas by wildlife, especially where equestrian trails are frequently used such as the Cave Creek trail system. Soil compaction and removal of herbaceous and woody species associated with equestrian trails may negatively impact wildlife through removal of habitat and increased surface flows. Illegal horse trails have led to proliferation of wildcat motorcycle trails. Equestrians create trails and motorcycles utilize the wildcat trails. This is the case within Lime Creek. Equestrians have created a trail within Lime Creek and regularly brushed the trail making it very identifiable. Motorcycles now illegally utilize the trail within Lime Creek, which is within a Congressionally designated Road-less Area, and occupied topminnow habitat. Damage to riparian vegetation, stream banks and uplands in the area, and on the unauthorized trail has been documented by the District Biologist as recently as April 2007 (USFS 2007a). Other negative effects to wildlife include, noise, presence of people, watershed effects

from unauthorized trails, and petroleum or toxic substances that may be left behind, especially at stream crossings. Evidence of sources of damage were easily determined to be from equestrians and motorcycles due to tracks left, and height of brush trimmed (rider on horse prune vegetation eight feet and higher). Implementation of the Travel Management Rule should help with enforcement within the designated Road-less Area, although funding and personnel must be provided to address travel management specifically.

Maintenance of roads and trails may also negatively affect wildlife by the mere presence of equipment or people conducting the work and associated noise which may lead to wildlife avoiding those areas when maintenance is underway. Road maintenance affects to wildlife are minimal due to the infrequent maintenance cycle (ca. two times / year) of FR 24 and FR 41, the only roads that are maintained on the allotment.

Wildfire and suppression activities may also negatively affect wildlife and associated habitat by direct loss of habitat to fire or suppression activities (brush removal, line construction, black-line construction, aerial application of retardant, drafting from streams) and indirect effects such as fire support aircraft noise, sedimentation in aquatic systems and avoidance of areas with fire suppression activities.

A mine may be developed in the Gray's Gulch area in the future. Specifics about the potential mine operation are not available at this writing. If the mine is determined to be a commercial open pit mine, it may present hazards (chemicals, leach ponds, electrical) during construction of the mine and during mineral extraction. Wildlife may avoid the mine area all together since habitat would likely be removed, and presence of people and associated noise (equipment operation, blasting) would deter wildlife from utilizing the area or areas that may be visible from the mine. Additional traffic within the area, to support the potential mine development and operation, would result in impacts to wildlife discussed previously.

Clean up of the Bearup Mine will be of benefit to wildlife over the long haul. Leach ponds will be treated to eliminate toxic substances and thus remove those threats that currently exist to wildlife. Native grasses will be planted within disturbed areas of the mine, although very limited success was achieved by the author utilizing the same seed mix to treat fire suppression lines following the Complex fire. Short-term negative effects to wildlife may be realized during the clean up by presence of people / machinery, and noise associated with the clean up.

Recreational shooting may have negative impacts to wildlife as a result of noise created by shooting or presence of people. Trash and debris shooters often leave behind may pose hazards to specific wildlife and actually attract other shooters due to available target material. For the most part recreational shooting occurs throughout the majority of the allotment, with exception of the areas adjacent to FR 24 south of Bronco Trailhead. Hunting may have negative impacts on wildlife in that high concentrations of hunters

utilize the allotment due to proximity to Phoenix. Wildlife impacts associated with hunting include high concentrations of hunters, illegal off-road travel, littering, increased presence of people / vehicles and poaching. Recent Arizona hunting regulation changes added another deer season in the area, which will further contribute to hunter related issues associated with wildlife.

The Camp Creek recreation residences may also negatively affect wildlife on the allotment. Perennial portions of Camp Creek are within ¼ mile of the allotment boundary. Domestic use of spring resources by residences reduces surface flows available to aquatic and terrestrial wildlife and may reduce riparian development. Domestic demands placed on springs by recreation residence is in many cases continued throughout the year, in violation of the six month stay limit identified in the permit. Documented outside irrigation systems, in violation of permit terms, place additional demands on spring resources. Watering of plants, many non-native, by leaving water hoses turned on for extended periods (weeks or months), by recreation residences, has been documented. Domestic pets associated with the residences may kill, injure, or harass wildlife. Recreation residences exist on each side of the perennial portions of Camp Creek thereby reducing the likelihood that some wildlife will use the area, and reducing available area for additional riparian development.

A fish barrier is scheduled to be constructed in the lower portion of Lime Creek, a tributary of Horseshoe Reservoir (Horseshoe), by Salt River Project within the next couple years. The objective is to eliminate upstream movement of non-native fish from Horseshoe into Lime Creek where topminnow currently exist. Once constructed, the barrier will eliminate the possibility of non-native fishes from moving into occupied topminnow habitat and eliminating competition, or consumption of topminnow by non-native fishes. Short term negative effects may occur during construction of the barrier such as presence of people or equipment within or near Lime Creek and noise associated with construction.

The Forest Service recently acquired 28 acres of land previously owned by the Cartwright Ranch. Twenty acres of the land are within riparian habitat (Bronco Creek & Cave Creek), and the remaining eight acres are within upland habitat. The portion of Cave Creek is within flycatcher potential habitat and will be fenced adjacent to the Quien Sabe pasture to exclude livestock access, if grazing occurs in the future. Fencing of the habitat will remove direct livestock effects within the habitat. Flooding and watershed effects from the Complex fire will continue to negatively effect the fenced portion of flycatcher potential habitat, although exclusion of grazing may assist in development of vegetation and stream characteristics to reduce flooding effects. Acquisition of Bronco Creek will permit the Forest Service to manage the area with wildlife and watershed considerations in mind, thus will benefit wildlife. The upland portions of the land will be managed similarly as other upland areas within the area. The Bronco pasture contains the upland portion of the land to be acquired. Upland habitat may improve under Forest Service management, although it is unknown to the author how the land was managed under private ownership.

Mitigation Measures Common to All Grazing Alternatives.

In response to public comments, and specialist input, mitigation measures were developed to reduce or minimize some potential impacts of grazing or associated improvements. Mitigation measures will be implemented under all grazing alternatives and be incorporated in the Environmental Assessment and the AMP. Mitigation measures are considered to be effective reducing environmental impacts. They are intended to be consistent with applicable Forest Plan standards and guidelines and the terms and conditions and conservation measures of existing biological opinions. Implementation of the mitigation measures in combination with project design criteria should avoid the occurrence of potentially significant environmental impacts.

Soil, Water and Vegetation – the objective is to manage rangeland vegetation to protect basic soil and water resources, provide for ecological diversity, improve or maintain environmental quality, and meet public needs for interrelated resources uses (FSM2202 – Objectives). Practices include, but are not limited to the following.

- Monitoring will determine if the allotment had recovered sufficiently from the Complex Fire to be grazed. The Forest and permittee will jointly prepare annual operating instructions (AOIs) that consider current conditions and management goals. Periodic field checks including stock counts, utilization monitoring, and range improvement maintenance checks will be used to identify needed management adjustments. Monitoring for each pasture will occur throughout the grazing period.

- Trigger points of 30-35% upland herbaceous use, and 40% woody riparian use will be utilized to permit time to move livestock to other pasture(s) under implementation of all grazing alternatives. Livestock use will be measured/estimated and documented for each pasture throughout the grazing period. Monitoring information, along with actual livestock use, may be used to adjust annual authorized use (livestock numbers of length of time grazed).

- Apply utilization limits to critical riparian areas (see *Definitions*, Appendix 4) (stream channels / springs/ riparian areas), and monitor throughout the grazing period. Critical riparian areas are those stream channels / springs / riparian areas selected to indicate achievement of management objectives. They are representative, responsive to changes in management, contain key riparian species, and are accessible to livestock. Nine critical reaches were selected on the allotment. They are listed by pasture in Table 6. The selection of these critical areas is based on analysis of over 80 miles of intermittent and perennial stream channels on the Cartwright Allotment.

Table 6. List of critical reaches within each pasture.

Pasture	Stream
6L	Cave Creek
Quien Sabe	Cave Creek
Grays Gulch	Cave Creek
Humboldt	Cave Creek
Humboldt	Walnut Spring
Mule Holding	Walnut Spring Canyon
Seven Springs Holding	Walnut Spring Canyon
Bronco	Seven Springs Wash
Maverick	Camp Creek

- Through adaptive management, adjustments would provide sufficient flexibility to adapt to challenging circumstances. If monitoring results reveal that grazing activities are resulting in undesirable impacts, then the USFS will amend the management action through the Annual Operating Instructions (AOI). The amendment would be based on a modified action adjusting one or more aspects of grazing (intensity, timing, frequency, numbers, and duration).

- Eliminate the use of riparian areas and desert washes for gathering, trailing, and shipping livestock, and do not construct future livestock facilities in riparian areas or washes. Begin to remove all livestock handling, gathering, and shipping facilities from riparian areas and desert washes.

- Necessary techniques will be used to achieve proper distribution or lessen the impact on sensitive areas. Practices include herding, salting and controlling access to waters. Salt or similar solid supplements will be placed on good feed, one quarter to one half mile from waters and salting locations will be moved annually. Placement of liquid supplements will require prior approval of the District Ranger.

- No hay or bulk feed will be placed on Forest lands in order to minimize the introduction of weed seeds.

Wildlife Mitigation- Objectives are to reduce impacts to wildlife from livestock grazing and from disturbance associated with construction of range facilities.

- All water developments will include wildlife access and escape ramps.

- All new fencing, reconstruction and maintenance of fences will be to Forest Plan standards to provide for wildlife passage through the fence. At a minimum, this will be a 4-strand fence with smooth bottom wire 16 inches off the ground and a total height of 42 inches or less.

- All proposed range facilities will be surveyed for threatened, endangered or sensitive species prior to any ground-disturbing activities. Facilities will be designed and constructed to have no adverse effect on listed species.
- Monitor stream banks and riparian utilization to determine livestock effects to riparian vegetation recruitment and bank stability. Identify locations along Cave Creek and Seven Springs to monitor stream bank alteration effects to riparian vegetation. Adjustments may be made to the Annual Operating Instructions based on the findings.
- Monitor upland herbaceous use throughout grazing period to ensure utilization remains within permitted levels.

CONTACTS/CONTRIBUTORS/PREPARERS

Tonto National Forest:

Todd Willard, Fisheries & Wildlife Staff Biologist, Cave Creek Ranger District
Bob Calamusso, Fisheries Biologist, Tonto National Forest
Carol Engle, Range and Watershed Staff, Cave Creek Ranger District
Janet Grove, Riparian Specialist, Tonto National Forest
Norm Ambos, Soil Scientist, Tonto National Forest
Lynn Mason, Hydrologist, Tonto National Forest
Steve Lohr, Biologist, Tonto National Forest

Arizona Game and Fish Department:

Chris Cantrell, Non-game Branch, Phoenix

U. S. Fish and Wildlife Service:

Greg Beatty, Biologist, Arizona Ecological Services

SIGNATURE PAGE

PREPARER:

I prepared this Biological Assessment. It is my determination that ongoing livestock grazing on Cartwright Allotment on Tonto National Forest may affect, and is not likely to adversely affect individuals or identified potential habitat for the Southwestern willow flycatcher under implementation of alternatives B, C, or D. It is my determination that selection of alternative A, no grazing alternative, will have no effect on the Southwestern willow flycatcher or its habitat.

It is my determination that ongoing livestock grazing on Cartwright Allotment on the Tonto National Forest will have no effect on Gila topminnow or occupied habitat under implementation of all alternatives. Informal consultation with the U. S. Fish and Wildlife Service is required for the Southwestern willow flycatcher and identified potential habitat.

/s/ *Todd Willard*	October 12, 2007
Todd Willard, Cave Creek District Biologist	Date
Tonto National Forest	

APPENDICES

Appendix 1 – Chapter 90 of FSH 2209.13

Appendix 2 – Tonto National Forest Rangeland Drought Policy

Appendix 3 – Southwestern Willow Flycatcher Habitat Fluvial Characteristics. Procedures For Identification & Designation of Southwestern Willow Flycatcher Habitat.

Appendix 4 - Definitions

APPENDIX 1 – CHAPTER 90 of FSH 2209.13

This chapter focuses on National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) analysis, NEPA-based decisions, and the implementation of those decisions regarding rangeland management and livestock grazing with an objective of achieving and maintaining desired rangeland conditions on National Forest System (NFS) lands. The direction that follows is for determining whether livestock grazing is an acceptable use on a given allotment of National Forest System land. General environmental analysis requirements are set forth in regulations adopted by the Council on Environmental Quality at 40 CFR 1500 et seq. and at FSH 1909.15.

A proposed action may be relatively broad, encompassing several actions intended to achieve desired rangeland conditions, or the proposed action could be relatively narrow and focus only on the authorization of livestock grazing. In the latter case, the proposed action need only be consistent with the land and resource management plan (LRMP).

Most livestock grazing on National Forest System lands has occurred in the areas presently grazed, in a variety of forms, for over a hundred years. Typically during that time numerous grazing systems have been implemented along with accompanying range improvements. Stocking rates and seasons of use have been adjusted; the timing, intensity, frequency, and duration of grazing have been continually fine tuned over time. More recently, further adjustments have been made on many allotments to provide for the needs of species listed under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531 et seq.), clean water, and archeological structures and artifacts. This dynamic evolution of management, on most allotments, results in the ability to narrow the range of alternatives that must be analyzed in detail. When a proposed action includes authorization of livestock grazing, and lacks any significant issues identified during scoping, alternatives analyzed in detail would be limited to: the proposed action, no action (which is no grazing), and current management.

91 - RANGELAND MANAGEMENT DIRECTION IN LAND AND RESOURCE MANAGEMENT PLANS (PROGRAMMATIC PLANNING LEVEL)

Among other things, LRMPs identify the suitability of land on National Forest System units to produce forage for grazing animals and establish programmatic direction for grazing activities, including goals, objectives, desired conditions, standards, guidelines, and monitoring requirements. Although an area may be deemed suitable for use by livestock in a LRMP, a project-level analysis evaluating the site-specific impacts of the grazing activity, in conformance with NEPA, is required in order to authorize livestock grazing on specific allotment(s). See FSM 1920 and FSH 1909.12 for basic direction for addressing rangeland resources in LRMPs.

91.1 - Consistency With Land And Resource Management Plan

Under the National Forest Management Act (NFMA) of 1976 (16 U.S.C. 1600 et seq.), project-level decisions, which authorize the use of specific National Forest System lands for a particular purpose like livestock grazing must be consistent with the broad

programmatic direction established in the LRMP. Consistency is determined by examining whether the project-level decision implements the goals, objectives, desired conditions, standards and guidelines, and monitoring requirements from the LRMP. Where necessary, grazing permits must be modified to ensure consistency with the LRMP.

91.2 - Relationship Of Land And Resource Management Plans To Grazing Permit

Pertinent direction in LRMPs relating to livestock grazing are included directly in part 3 of the grazing permit (sec. 94.2) on Forms FS-2200-10a, FS-2200-10b, and FS-2200-10c if an allotment management plan (AMP) either does not exist or is inconsistent with the LRMP. The AMP becomes a part the grazing permit form, part 3. These forms are available electronically on the forms webpage on the FS Web/Intranet.

92 - PHASES OF RANGELAND MANAGEMENT PLANNING

There are three distinct phases in the rangeland project planning process:

1. The analysis process leading up to and including the development of a proposed action, referred to as "plan-to-project";

2. Project initiation; and

3. The project-level planning and NEPA compliance process which is focused on site-specific analysis of the proposed action and alternative actions.

These analyses may be conducted on an allotment or group of allotments that share similar ecological conditions and resource issues. If a thorough analysis is conducted in development of the proposed action, the NEPA process can move more quickly and efficiently.

92.1 - Plan-to-Project Analysis

The responsible official has broad discretion in determining what analysis precedes formal NEPA analysis and documentation. The steps that follow lend themselves to those project proposals that involve a higher level of complexity and can be adjusted as warranted. These are important steps that, if taken in preparation for a project-level NEPA proposal, increase the efficiency of the NEPA planning process. These steps include:

1. Identification of desired conditions (sec. 92.11);

2. Identification of existing conditions (sec. 92.12);

3. Identification of resource management needs (sec. 92.13);

4. Identification of possible practices (sec. 92.14), and

5. Identification of information needs (sec. 92.15).

92.11 - Identification of Desired Conditions

A team, using an interdisciplinary approach, identifies the desired conditions for rangelands and other related resources within the analysis area. Desired conditions should be specific, quantifiable, and focused. Desired condition statements have two distinct scales.

1. At the landscape scale, desired conditions are generally taken directly from the LRMP.

2. At the broad scale, desired conditions are then further described on a site-specific scale for reference areas.

Monitoring can then tie to these reference areas as a means of determining progress toward meeting the desired conditions.

92.12 - Identification of Existing Conditions

An analysis team examines the existing conditions within the analysis area for all pertinent resources for which a desired condition is identified, such as ecological status of the vegetation, composition and arrangement of plant communities, status and function of riparian areas and wetlands, stream bank and stream channel characteristics, wildlife and fish habitat characteristics, cultural resource protection, soil protection, and water quality.

Existing conditions should be specific and quantified where possible. Existing conditions may be evaluated at two scales.

1. At the landscape scale, existing conditions are generally taken from watershed-level or other area assessments.

2. At the project-level, existing conditions may be identified through a myriad of sources, including rangeland inspections, rangeland analyses, environmental analysis documentation for other actions in the area, electronic resource databases, and anecdotal information from previous or current grazing permittees or other knowledgeable sources.

The data and information must be pertinent to identifying differences between existing and desired conditions related to rangeland resources. Data collected should address the appropriate timing, intensity, frequency, and duration issues of livestock grazing so that alternatives can be developed that utilize an adaptive management approach based on specific monitoring criteria.

Do not collect needless information that may not help identify rangeland resource problems and that is not specific to the project area.

The preferable sequence of project-level planning is to complete large-scale

assessments, encompassing a watershed or sub-watershed, prior to initiating the project-level decision making process. This allows for efficient use at the project level of the inventory, analysis, and assessment information gathered at the larger scale. Upon the completion of large-scale assessments, site-specific analyses, and project-level decisions may be scaled down to allotments that share similar ecological conditions and resource issues. Project-level decision making conducted in this manner is more expeditious and efficient.

92.13 - Identification of Resource Management Needs

Identification of resource management needs is simply the comparison of desired conditions with existing conditions to determine the extent and rate at which current management is meeting or moving toward those desired conditions. Where a particular existing condition and desired condition are the same, there is no need for change. Conversely, where an existing condition and a desired condition are not the same, there is a need for change. A need for change should equate to the purpose and need for the action to be proposed.

Monitoring (sec. 95) and permit administration may have already identified certain "concerns" on an allotment. That means that there is already knowledge of specific existing conditions that are not the same as desired conditions. The plan-to-project analysis helps to methodically identify existing conditions, desired conditions, and any disparity between them so that the analysis team and the line officer can reach agreement on rangeland resource management concerns before identifying possible practices.

Inspections, monitoring, and continual dialogue with permittees provides an ongoing feedback loop for the need to maintain or change management on the ground. Issuance of a permit and subsequent allotment administration, by its very nature, establishes an obligation for close working relations between agency personnel and permittees.

92.14 - Identification of Possible Practices

Identify possible practices or actions that may be undertaken to meet the identified management needs. The responsible official may, in his or her discretion, limit the list of possible practices to various livestock grazing practices, or alternatively consider all types of practices that may be employed to reach desired rangeland conditions. Ultimately, the responsible official decides which of the identified possible practices are carried forward to a proposed action. In doing so, the responsible official should consider a full array of likely possibilities in the proposed action.

92.15 - Identification of Information Needs

1. Evaluate the quality, accuracy, and usefulness of the information being used to describe existing conditions.

2. Identify any important gaps in knowledge that keep the analysis team from understanding and evaluating differences between desired and existing conditions.

3. Estimate what it would cost in terms of time, money, and effort to obtain missing information, and if it is worthwhile to collect it.

4. Identify how the information gap relates to the decision framework.

5. Determine if the information is important enough for the decision that the information must be gathered or the decision rationale will be lacking.

92.2 - Project Initiation

To initiate a project, the following steps are then taken:

1. Development of a decision framework (sec. 92.21);

2. Development of a purpose and need statement (sec. 92.22); and

3. Development of a proposed action (sec. 92.23).

92.21 - Decision Framework

Before characterizing the nature of a livestock grazing authorization decision, it is important to establish whether or not a valid decision already exists. If a decision has already been made to authorize livestock grazing in a specific area, and resource conditions are at or moving toward desired conditions, a new decision may not be necessary. Review the environmental analysis documentation and assess whether there is sufficient new information, technology, or changed conditions to warrant a new analysis and decision. If a previous analysis and decision are still valid, document this finding and continue to implement the decision to authorize livestock grazing by issuing a new permit and continuing to apply management as prescribed in the decision (sec. 96).

There is a two-part decision to be made for authorizing livestock grazing.

1. Whether livestock grazing should be authorized on all, part, or none of the project area.

2. If the decision is to authorize some level of livestock grazing, then what management prescriptions will be applied (including standards, guidelines, grazing management, and monitoring) to ensure that desired condition objectives are met or that movement occurs toward those objectives in an acceptable timeframe.

92.22 - Purpose and Need

Neither the Council on Environmental Quality regulations at 40 CFR parts 1500-1508, nor the courts have made a distinction between the terms "purpose" and "need." Therefore, "purpose and need" is referred to as a single item. The purpose and need statement should simply explain why the action is being proposed. The purpose and need statement should answer the questions: "Why here?" and "Why now?"

The purpose and need for the proposed action has its origin in the gaps between desired resource conditions and existing conditions. These gaps, articulated as "resource management needs" (sec. 92.13), provide the basis for describing the purpose and need for action. Where existing resource conditions are meeting or moving toward the desired conditions, the purpose and need for action may simply be that a qualified applicant has requested authorization to graze livestock.

92.23 - Proposed Action

1. The proposed action is initially developed as a possible practice during the plan-to-project analysis (sec. 92.1). A proposed action may undergo many refinements before being formally proposed. Once an action is proposed, the NEPA process begins. Agency personnel should actively work together with permittees to resolve identified management problems. Development of a proposed action is ideally a partnership effort done informally within the obligations imposed by the grazing permit (sec. 94.2). The agency defines the desired land condition; permittees have a stake in helping to determine how to get there when livestock grazing is authorized. If a plan-to-project analysis indicates that livestock grazing is a possible management practice, then the proposed action should include the authorization of livestock grazing and the required livestock grazing management practices necessary to maintain or attain desired resource conditions.

2. A proposed action that includes authorization of livestock grazing shall also include the basic elements of an allotment management plan (AMP) (sec. 94.1) because these elements will ultimately be obtained directly from the NEPA-based decision and will be included in part 3 of the grazing permit Forms FS-2200-10a, FS-2200-10b, and FS-2200-10c) as an AMP. Both the issuance of the permit and the development or amendment of an AMP that becomes a part of the permit is considered an administrative action that implements the NEPA-based decision
(sec. 94). The pertinent parts of an AMP include:

a. Management objectives in terms of the condition and trend of the rangeland resources;

b. Required livestock management practices including maximum amount of use in terms of allowable use levels to achieve management objectives;

c. Structural or non-structural improvements that are necessary and ripe for implementation; and,

d. Appropriate monitoring to determine if management objectives are being met or if adaptive management alterations are needed.

3. When the proposed action includes an adaptive management approach, there should be a change from specifying a fixed number of livestock and on- and off- dates to specifying the maximum limits or parameters for the appropriate timing, intensity, frequency, and duration variables (sec. 92.23b).

92.23a - Scope of Proposed Action

The responsible official determines the scope of a proposed action. This means that the line officer with the delegated authority to implement a proposed action also has the discretion to decide how complex or narrowly focused a proposed action is. A proposed action that is broad in scope may encompass a suite of activities designed to achieve various desired resource conditions. Alternatively, a proposed action that is narrow in

scope may focus exclusively on authorization of livestock grazing.

While there is no requirement regarding how narrow or broad the scope of a proposed action is defined, the scope has a direct bearing on the complexity of the environmental analysis. Combining several activities into one proposed action may be efficient for analysis purposes, but analysis timeframes generally increase with the breadth of scope. Trade offs are generally associated with time or cost. Proposed actions that are broad in scope generally take more time to analyze, but planning costs are less per activity. Conversely, proposed actions that are narrow in scope generally take less time to analyze, but planning costs per activity may be higher. Responsible officials should consider these trade offs when developing proposed actions.

92.23b - Adaptive Management

1. When livestock grazing is proposed using an adaptive management strategy, the proposed action shall set defined limits using adaptive management principles of what is allowed, such as timing, intensity, frequency, and duration of livestock grazing. These limits set standards that can be checked through monitoring to determine if actions prescribed were followed, and if changes are needed in management. The NEPA analysis discloses the effects for these standards. Administrative actions within the defined limits of the resultant NEPA-based decision can then be implemented without additional NEPA. Examples of administrative decisions include:

a. Determination of specific dates for grazing,

b. Specific livestock numbers,

c. Class of animal,

d. Grazing systems, and

e. Range readiness when these variables fit within the NEPA-based decision.

2. Adaptive management utilizes the interdisciplinary planning and implementation process that provides:

a. Identification of site-specific desired conditions;

b. Definition of appropriate decision criteria (constraints) to guide management;

c. Identification of pre-determined optional courses of action, as part of a proposed action to be used to make adjustments in management over time, and

d. Establishment of carefully focused project monitoring to be used to make adjustments in management over time.

Planning for adaptive management may be initiated during development of the proposed action. It involves identification of future management options that may be needed to accelerate or adjust management decisions to meet desired conditions and/or project standards and objectives, as the need is determined through monitoring.

3. In circumstances where changes in conditions warrant implementation of a management option that has not been provided for in the NEPA analysis, or when the predicted effects of implementation are determined to be greater than the effects originally predicted, a supplemental or new NEPA analysis and NEPA-based decision is needed.

4. Building adaptive management flexibility into management allows for decisions that are responsive to needed adjustments in permitted actions. Historically, decisions have been too narrowly focused, such as deciding to authorize a specific number, kind, or class of livestock with specific on- and off-dates under a specific type of grazing system. These kinds of decisions have restricted management flexibility in meeting desired conditions and project objectives.

5. The key to development of adaptive management actions is to focus on factors that are essential to ensure management objectives are met. Critical factors may consider issues, such as timing restrictions in specific areas to manage conflicts with fisheries, big game, or recreation; or allowable use standards to ensure retention of defined levels of cover or riparian residual vegetation to trap and retain sediments. In any case, the focus must be on defining criteria that are critical to management success and to move away from making decisions that unduly restrict flexibility. Yet, in all cases, the proposed action must adequately detail the type and level of activities that can take place on a given allotment(s).

6. With a well-crafted adaptive management approach, the NEPA-based decision can remain viable for an extended period of time as long as there is periodic review of the actions for consistency with the NEPA-based decision. In most cases, the only situations that would require an updated NEPA analysis would be where unforeseen changed conditions have occurred that require management actions that have not been considered, and which may produce effects outside the scope of those predicted within the original NEPA analysis document.

92.3 - Project-Level Planning and NEPA Compliance

Project-level decision making is usually more expeditious and efficient when it is based upon the completion of large scale assessments, followed by site-specific analyses on allotments that share similar ecological conditions and resource issues.

Except where expressly provided for by law, a site-specific analysis of environmental effects of livestock grazing projects on affected National Forest System lands and resources must be completed pursuant to NEPA before the grazing activity can be authorized.

General environmental analysis requirements are set forth in regulations adopted by the Council on Environmental Quality at 40 CFR 1500 et seq. and in the Forest Service Directive System at FSH 1909.15.

92.31 - Alternatives

Analysis of alternatives requires consideration of a range of reasonable alternatives. The range of reasonable alternatives includes both alternatives that warrant detailed analysis, and alternatives that are considered but eliminated from detailed study. In cases where the design and configuration of the proposed action can mitigate resource concerns to acceptable levels, the proposed action may be the only viable action alternative. When there is a significant issue with the proposed action, an alternative to the proposed action shall be developed and analyzed in detail (FSH 1909.15, sec. 14). In all cases, the rationale and development of alternatives shall be addressed and disclosed in the NEPA analysis for the project.

In addition to the proposed action, the "no action" alternative shall always be fully developed and analyzed in detail. "No action" is synonymous with "no grazing" and means that livestock grazing would not be authorized within the project area.

Current management should also be analyzed in detail as an alternative to the proposed action if current management meets the stated purpose and need for action. This alternative shall be based on the current management actions being implemented, specifically, current management over the last 3 to 5 years. Current management direction may be contained in an allotment management plan (sec. 94.1), annual operating instructions (AOI) (sec. 94.3), or a combination thereof. The current management alternative may also be the proposed action. This would be appropriate when current management is determined to be consistent with the land and resource management plan and has been shown to be effective in meeting resource objectives through monitoring over time.

Detailed direction for development of alternatives is found in FSH 1909.15, section 14.

92.32 - Effects of Alternatives

The evaluation of a proposed action's environmental effects must include:

1. The potential effects of all actions,

2. All adaptive management options included in the alternatives, and

3. Those actions that may be implemented at some future point in time. For example, if one potential option is to fence off a riparian area, the effects of that fence must be evaluated even if that management option may never actually be implemented.

Detailed direction for estimating effects of each alternative is found in FSH 1909.15, section 15.

92.33 - Documentation

The level of environmental analysis and documentation required for Forest Service projects is guided by the NEPA procedures set out at FSH 1909.15, chapters 20 and 40.

93 - INTEGRATION OF OTHER LEGAL REQUIREMENTS INTO RANGELAND MANAGEMENT DECISIONMAKING PROCESS

93.1 - Endangered Species Act (ESA)

For direction on compliance with ESA, refer to 50 CFR part 402, implementing regulations of ESA, and FSM 2670.

93.2 - National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470 *et seq.*)

For further direction, refer to the National Programmatic Agreement between the Forest Service and the Advisory Council on Historic Preservation Regarding Rangeland Management Activities on National Forest System lands (FSM 1539.61), and also to State or local programmatic agreements.

93.3 - Clean Water Act (CWA)

Compliance with the CWA is achieved through the proper site-specific design, implementation and monitoring of Best Management Practices (BMP). BMPs are practices approved by the State and the Environmental Protection Agency (EPA) that are intended to result in compliance with State water quality standards. BMPs are usually a component of land and resource management plans (LRMPs), and are often listed in Chapter 2 of a LRMP with Forest Standards. As approved practices or as Forest Standards, BMPs are one of the required elements of each environmental assessment and AMP. A key concept of BMPs is that if monitoring identifies any circumstance of noncompliance with State water quality standards, then the Forest Service is obligated to respond to the situation to restore compliance. As long as BMPs have been applied and monitoring and adjustments are ongoing, then the Forest Service is in compliance with the CWA. See EPA's SAM-32 direction, 8/87, *http://www.epa.gov/waterscience/library/wqstandards/npscontrols.pdf* for further direction.

When an allotment contains streams or lakes included on a State's 303(d) list of impaired waters (these waters are also included in the State's bi-annual 305(b) report), it means that a State-led Total Maximum Daily Load (TMDL) process for restoration is required. The process is the responsibility of the States to design, and the Forest Service to implement and monitor. The TMDL shall include specific restoration and monitoring requirements, even on Federal lands. Check with your Regional Office to determine whether a Memorandum of Understanding has been established with the State that allows the Forest Service to perform the required TMDL process, or allows collaboration with the State in its development. Prior to the establishment of a formal TMDL, management may continue as long as BMPs are applied and subsequent monitoring is implemented.

94 - NEPA-BASED DECISIONS AND IMPLEMENTING ACTIONS THAT FOLLOW

Except as authorized under section 504(a) of the Rescissions Act of 1995 (Pub.L. 104-19) or the 2004 Omnibus Appropriations Resolution (Pub.L. 108-108, Nov. 10, 2003), the project-level NEPA-based decision to authorize grazing on one or more allotments is made by the authorized officer upon completion of site-specific environmental analysis. The decision to authorize grazing is made in the NEPA-based decision document whose major focus is on maintaining or achieving the desired land condition. The grazing permit, accompanying allotment management plan (AMP) (sec. 94.1) as appropriate, and annual operating instructions (sec. 94.3) all serve to implement the project-level decision

to authorize grazing (sec. 96). The AMP becomes a part of the grazing permit. If an AMP currently exists, it should be revised to reflect new information from the most recent project-level decision. The grazing permit is then modified to include the revised AMP. Subsequent modifications to grazing or related management activities may be made as long as those changes are within the scope of the project-level decision.

94.1 - Allotment Management Plans (AMPs)

AMPs contain the pertinent livestock management direction from the project-level NEPA-based decision (sec. 92.23, para. 2). AMPs also refine direction in the project-level NEPA based decision deemed necessary by the authorized officer to implement that decision. AMPs should be developed concurrently with the completion of the site-specific analysis and project-level decision.

Each AMP shall become a part of Part 3 of the grazing permit with a letter to the permittee(s) notifying them of this modification.

94.2 - Grazing Permits

A grazing permit is the instrument that authorizes a specific holder of the grazing permit to graze livestock on certain National Forest System or other lands under Forest Service jurisdiction. The grazing permit contains specific terms and conditions as provided by the NEPA based decision that authorized the grazing use. The timely issuance of a grazing permit constitutes implementation of a project-level NEPA-based decision. The terms and conditions of the grazing permit must be consistent with the project-level decision. Where site-specific analysis and a project-level decision are completed subsequent to issuance of a grazing permit pursuant to section 504(a) of the Rescissions Act, or the 2004 Omnibus Appropriations Resolution (Pub.L. 108-108, Nov. 10, 2003) it may be necessary to modify the existing permit or issue a new permit with new terms and conditions to ensure that it conforms to the direction of the project-level decision.

94.3 - Annual Operating Instructions (AOI)

The AOIs specify those annual actions that are needed to implement the management direction set forth in the project-level NEPA-based decision. Actions in the AOIs must be within the scope of the project-level decision, and as such are not required to undergo any additional site-specific environmental analysis.

To the extent feasible, the AOI should be developed with the permittee. The AOIs shall clearly and concisely identify the obligations of the permittee and the Forest Service, and clearly articulate annual grazing management requirements, standards, and monitoring necessary to document compliance.

The AOIs should set forth:

1. The maximum permissible grazing use authorized on the allotment for the current grazing season and should specify numbers, class, type of livestock, and timing and duration of use.

2. The planned sequence of grazing on the allotment, or the management prescriptions and monitoring that will be used to make changes.

3. Structural and non-structural improvements to be constructed, reconstructed, or maintained and who is responsible for these activities.

4. Allowable use or other standards to be applied and followed by the permittee to properly manage livestock.

5. Monitoring for the current season that may include, among other things, documentation demonstrating compliance with the terms and conditions in the grazing permit, AMP (sec. 94.1), and AOI. In addition, the permittee may be asked to provide information regarding livestock distribution or the condition of improvements. Where adaptive management prescriptions are being followed, this section of the AOI must provide details about those monitoring items and decision points needed to determine when a change is necessary and to guide the direction that those changes take (sec. 95).

95 - MONITORING

Monitoring shall be included in the project-level decision. **This includes monitoring required as a result of section 7 of the Endangered Species Act regarding consultation (sec. 93.1)**. Monitoring can determine whether the project-level decision is being implemented as planned (implementation monitoring) and, if so, whether the objectives identified in the LRMP and AMP (sec. 94.1) are being achieved in a timely manner (effectiveness monitoring). Allotment monitoring should be an open, cooperative, and inclusive process. Invite participation from rangeland users and other interested parties where feasible. Implementation and focused effectiveness monitoring are critical to determine when or if adaptive management changes should be made and to guide the direction that those changes take.

As the project decision is implemented, monitoring should indicate whether actions are being implemented as planned and are meeting standards and design criteria (implementation monitoring), and whether those actions are effective in meeting or moving toward desired resource conditions (effectiveness monitoring). If monitoring indicates that desired conditions are not being met, other pre-determined management options (such as adaptive management) included in the project decision may be selected for implementation. If monitoring indicates that management is meeting standards, and is meeting or moving toward the desired conditions in an acceptable timeframe, the initial management options may continue.

Finally, management requires the interdisciplinary team and authorized officer to periodically evaluate monitoring results and to determine if other described management options are warranted.

95.1 - Types of Monitoring

The two types of monitoring to consider in the site-specific analysis and project-level decision are:

1. Implementation monitoring. This type of monitoring determines if activities are implemented as designed.

2. Effectiveness Monitoring. This type of monitoring determines if activities are effective in meeting objectives. Evaluation of the results of effectiveness monitoring is used to implement adaptive management.

95.2 - Monitoring and Evaluation Methods

Interagency Monitoring Technical References provide the monitoring methodologies that should be used (FSM 2206). Technical references may be supplemented by Regional Handbooks
(FSM 2209).

95.3 - Allowable Use

Not exceeding allowable use is a responsibility permittees assume when they accept a term grazing permit. Term permits are described in FSH 2209.13, chapter 10.

96 - REVIEW OF EXISTING PROJECT-LEVEL NEPA-BASED DECISIONS

Review of existing project-level NEPA-based decisions (sec. 94) must be conducted periodically to determine if the analysis and documentation remain valid or if new information exists that requires some further analysis and potential modification of the activity. If the authorized officer determines that correction, supplementation, or revision is not necessary, implementation of existing decisions shall continue. The findings of the review shall be documented in the project file. See FSH 1909.15, section 18 for further direction on review and analysis requirements related to existing project-level NEPA-based decisions.

96.1 - Modifications Not Requiring New NEPA-Based Decisions

A project-level NEPA-based decision remains valid as long as the authorized activity complies with laws, regulations, LRMP, and is within the scope of the project-level NEPA-based decision. Therefore, it is not necessary to initiate a new site-specific analysis in order to undertake a modification that has already been analyzed, decided upon, and documented. Management actions should be adjusted when monitoring indicates that those actions are not effective in reaching defined objectives. This is the basic premise behind adaptive management (sec. 92.23b).

96.2 - Adaptive Management Modifications

Adaptive management options that would be activated if the authorized activity is not achieving the anticipated objectives must be specified in the project-level decision. When monitoring indicates the need for implementation of adaptive management modifications disclosed in the project-level NEPA-based decision, those modifications can be implemented without further NEPA review.

Appendix 2 -. Tonto National Forest Rangeland Drought Policy

TONTO NATIONAL FOREST
RANGELAND DROUGHT POLICY

Climate in the Southwestern United States is highly variable with periods of drought being a relatively common occurrence. Consequently, planning for drought is a necessary part of prudent resource management.

Drought has a pronounced impact on National Forest resources. Rangeland plants are dependent on soil moisture for survival and are usually affected by lack of precipitation early in the drought cycle. Lack of adequate soil moisture affects virtually every physiological process in plants, often resulting in a loss of plant vigor, and, in extreme cases, plant mortality. Droughts that result in a reduction of vegetative ground cover can lead to increased soil erosion, a loss of site productivity and degradation of water quality. Lack of adequate forage and available water negatively affects both wildlife and domestic livestock.

Livestock use can accentuate the effects of drought by further stressing forage plants and depleting limited water supplies. Management of livestock prior to, during, and after drought is extremely important in order to protect soils, long-term site productivity, water quality, wildlife and other Forest resources and activities.

Policy

Rangelands will be managed so as to protect soil, water and other Forest resources during and after drought. The following principles will be utilized in implementing this policy:

- Drought conditions will be evaluated systematically utilizing a consistent Forest-wide approach.
- Conservative stocking of rangelands at all times will be a fundamental strategy in reducing drought impacts.
- During drought, each grazing allotment will be considered on a case-by-case basis for purposes of specifying management actions needed to protect Forest resources.
- Rangelands will be managed so as to protect forage plants after a drought has ended. Usually this will entail rest for a minimum of one growing season after normal precipitation resumes. After extended or severe drought, two or more growing seasons rest may be required.

Procedures:

Defining Drought: To respond to drought conditions in a timely and consistent manner, the Standardized Precipitation Index (SPI) shall be utilized to define drought. The SPI compares recent precipitation values to long-term historical norms to determine the dryness or wetness of a particular area. When the SPI for a particular Arizona Climate Division (as defined by NOAA) is at a value of –0.70 or less (larger negative number) for a specific time period (usually 9 to 12 months as determined by the Forest Drought Team), that area of the Forest shall be considered to be in a drought.

An SPI value of -0.70 indicates that precipitation is approximately 50% of the long-term average amount. (Note: This definition of drought is much more stringent than the Society of Range Management's definition which states that drought is "...prolonged dry weather when precipitation is less than 75% of the average amount."). The severity of the drought shall be indicated by the size of the negative number, the larger the number the more severe the drought. The primary purpose of the drought index will be to initiate an evaluation of drought conditions by the Forest Drought Team.

Forest Drought Team: The Forest shall establish and maintain a team whose primary purpose shall be to assess drought conditions and make recommendations as to any management actions needed to protect Forest resources.

Composition of Team: The team shall consist of the District Range/Watershed Staff from each District, the Group Leaders for Biological Resources and Physical Resources, a District Ranger, Wildlife Biologist, Soil Scientist, and Hydrologist. Other individuals who express an interest will also be considered for inclusion on the team. The Group Leader for Physical Resources, in consultation with the Forest Supervisor, shall be responsible for specifying individual team members. The Forest Supervisor shall notify individuals of their membership on the Forest Drought Team in writing.

Drought Team Responsibilities: The Drought Team shall meet whenever the SPI for a Climate Division within the Forest declines to a value of –0.70 or less, or when Team members feel that drought conditions have been reached (even though the SPI has not declined to a value of - 0.70). The Forest Hydrologist shall be responsible for tracking the SPI and notifying other team members when the threshold value of -0.70 is equaled or exceeded. The Drought Team shall assemble and assess all available information relative to drought and rangeland conditions, and discuss needed actions.

If the Drought Team determines that drought conditions exist, all potentially affected grazing permittees shall be notified, in writing, that an evaluation of drought effects on rangeland conditions is being conducted. No later than three weeks after the determination is made that drought conditions exist, each allotment either totally or partially within drought-affected areas shall be assessed, and a brief report written that **1)** describes the current situation on the allotment, and **2)** recommends any management actions needed to protect Forest resources. Where field observations are needed to assess range conditions, the assessment will be considered as a high priority and Forest personnel shall be made available to assist. When considering the current situation on an individual grazing allotment, the Team shall consider such factors as: Local precipitation data and departures from normal, current range conditions, current stocking levels, available water, and management intentions of the permittee.

Once the assessment is made, the Team shall forward their recommendations to the appropriate District Ranger(s) through the Forest Supervisor. The District Ranger shall determine the actions necessary to implement the Team's recommendations and notify the Forest Supervisor prior to implementation. Permittee notification and subsequent administrative actions will be completed as directed in Forest Service Manual 2200. It is imperative that management actions designed to minimize the effects of drought be implemented in a timely manner. In the case of livestock removal, it shall normally be accomplished within a maximum of 30 days after permittee notification. To the degree possible, timeframes allowed for the implementation of needed management actions shall

be consistent throughout the Forest.

Throughout the drought, the Team shall meet periodically to reassess conditions and evaluate the need for further actions. The frequency of meetings shall be determined by the Team, but shall not exceed two months.

<u>CONCLUSION OF DROUGHT</u>: DROUGHT PERIODS SHALL END WHEN THE SPI FOR THE LAST 12 MONTHS BECOMES POSITIVE. EVEN THOUGH PRECIPITATION HAS RETURNED TO NORMAL, RANGELAND PLANTS NORMALLY NEED MORE TIME TO RECOVER. THE TEAM SHALL ESTABLISH STANDARDS FOR RE-STOCKING ALLOTMENTS THAT WILL ENSURE THE PROTECTION OF RANGELANDS UNTIL PROPER RECOVERY IS COMPLETE. GENERALLY, AFTER NORMAL PRECIPITATION RESUMES, RE-STOCKING TO FULL CAPACITY SHALL NOT OCCUR UNTIL AFTER A MINIMUM OF ONE GROWING SEASON OF REST. IN CASES OF PROLONGED OR SEVERE DROUGHT, TWO OR MORE SEASONS OF REST MAY BE REQUIRED PRIOR TO RE-STOCKING. TO THE DEGREE POSSIBLE, TIMEFRAMES FOR RE-STOCKING RANGELANDS SHALL BE CONSISTENT FOREST–WIDE. RESTOCKING SHALL NOT OCCUR UNTIL AFTER CONCURRENCE OF THE FOREST SUPERVISOR

Appendix 3 – Southwestern Willow Flycatcher Habitat Fluvial Characteristics. Procedures for Identification & Designation of Southwestern Willow Flycatcher Habitat.

Southwestern Willow Flycatcher Habitat
Fluvial Characteristics

Grant Loomis, Mike Ross, Janet Johnson, Lynn Mason, Debbie Lutch

April 14, 2000

The Tonto National Forest is evaluating the suitability of its streams to provide habitat for the endangered Southwestern Willow Flycatcher. Based on guidance criteria (see appendix) from the Forest Service (8/25/99) and the Bureau of Land Management (2/9/99), the physical characteristics of stream channels are important determinants of the suitability or potential for a stream reach to provide habitat for the flycatcher. Fluvial features that affect habitat suitability include floodplain area, channel gradient and duration of stream flow. Floodplains are the sites most likely to be occupied by riparian vegetation for other than short duration (a few years) time periods, channel gradient is important for providing the quiet water areas found in occupied habitats, and duration of stream flow affects both the type of riparian vegetation that can be established at a site and whether open water will be available during the nesting season. The purpose of this writeup is to provide the Forest in general and the Forest's wildlife biologists in particular with information on the type of data available from the Forest's stream inventory and how that data can be used to evaluate whether suitable or potential habitat exists on certain streams

The Forest collects quantitative data about the physical characteristics of its stream channels during stream assessment inventories conducted primarily for project level analyses but to some extent as part of an ongoing inventory of stream channel conditions on the Forest. A qualitative summary judgment about the overall health of a channel is also conducted based on the quantitative data, channel stability indices (Pfankuch, 1975) and (Rosgen, 1996), and a riparian condition assessment (Thompson et al, 1998). In some instances inferences about trends in channel and riparian condition are available if repeat surveys have been conducted. Knowledge of stream type also permits inferences about a streams evolutionary history, its response to management, and what changes in fluvial characteristics might be anticipated with continued evolution. Site specific stream channel surveys can also be conducted for streams not included in the existing inventory and where an assessment of flycatcher habitat potential is necessary.

The Forest classifies its streams based on a stream channel classification system developed by Rosgen (1996). Rosgen uses a hierarchical assessment approach to classify streams on the basis of morphological variables. Variables used in the system, in hierarchical sequence, include: entrenchment ratio (the degree of vertical containment of a channel), width/depth ratio (ratio of bankfull width to mean bankfull depth), sinuosity (ratio of stream length to valley length), channel slope, and dominant channel materials (particle size distribution of bed and banks).

Once a stream's morphological features have been inventoried the stream can be classified into one of seven major stream types. These include:

- "A" stream types - steep (4-10% slope), narrow, and entrenched, typically step-pool systems with

narrow floodplains. These stream types are normally found in headwater areas.

- "B" stream types - moderate gradient (2-4%), moderately entrenched, riffle dominated channels, with width/depth ratios greater than 12. They also have relatively narrow floodplains.
- "C" stream types - low gradient (<2%), slightly entrenched, meandering, riffle/pool channels that have wide and well-developed floodplains.
- "D" stream types - braided with multiple bar and channel features, very high width/depth ratios, eroding banks and channel slope similar to the valley slope.
- "E" stream types - low gradient (<2%), slightly entrenched, with very low width/depth ratios (<12), and very high channel sinuosity.
- "F" stream types - deeply incised, low gradient (<2%), very high width/depth ratio streams. These streams have moderate sinuosity, a riffle/pool bedform and high bank erosion rates.
- "G" stream types - essentially gullies. They are entrenched, narrow and deep with a step/pool bedform. They have very high bank erosion rates and a high sediment supply.

"A" and "B" channel types are considered essentially unsuitable for flycatcher habitat because of steep gradients and narrow floodplains. "C" and "E" channel types are considered suitable or potential habitat if both floodplain width and duration of stream flow are sufficient to support the species of riparian vegetation necessary for flycatchers and to provide open water surfaces during the breeding season. "D" channels are unstable but can provide sufficient surface area on bar deposits for riparian vegetation to establish on at least a temporary basis and can provide open water surface during the breeding season. The mouth of Tonto Creek where it empties into Roosevelt Lake is an example of currently occupied habitat on a "D" type stream channel. The bar formations on which riparian vegetation becomes established in "D" systems can shift with each major flood. Habitat in this channel type should probably be considered transitory.

"F" and "G" stream types are typically transition channels that occur in the evolution of a stream from one stable form to a second stable form following the imposition of a natural or man-induced disturbance on a stream system. Understanding of the current stage in the evolutionary sequence of a stream can allow inferences about future channel adjustments and the potential for flycatcher habitat to eventually develop. A change in water flow or sediment discharge from a contributing watershed area, or destabilization of stream banks can cause channel adjustment processes that result in downcutting (incision) of a stream within its floodplain. If depth of incision exceeds some threshold flood flows will no longer inundate the flood plain on a relatively frequent basis. The floodplain is then abandoned by the channel and becomes a drier terrace that is no longer suitable for recruitment of riparian vegetation. Flood flows that previously spilled onto the floodplain are confined within the terrace walls of the newly downcut channel. Confinement of flood flows results in high bank erosion rates that cause widening of the channel. Once bank erosion has widened the channel sufficiently, a new floodplain will form at the lowered base level of the channel, and the stream should exist in a more stable form. "G" channel types typically occur during the active incision process. "F" channel types occur during the widening period. "G" channels are unlikely to evolve to the point where they could be considered potential habitat within the time frames (20-30 years) considered in the guidelines. "F" channels may have the potential to evolve into channels with sufficient floodplain width to provide the riparian vegetation necessary to be considered suitable habitat within the time frames considered in the guidelines. Judgment will be necessary to evaluate where "F" channel types are in their evolution and whether they will provide potential or suitable habitat within reasonable timeframes. Stream flow during the nesting season is still an essential component of habitat in these stream types.

"Bc" stream types are a special channel type that is commonly found on the Tonto NF. These streams have the moderately narrow floodplains characteristic of "B" streams but a flatter gradient that is more typical of "C" stream types. These streams may reflect the evolution of the "F" stream type to a more stable form. Further evolution to a stream type with a broader floodplain may occur slowly. Potential for "Bc" stream types to provide habitat will depend primarily on floodplain width, stream health rating (which can

provide insight about whether further floodplain development is anticipated) and flow duration.

Approximately 200 stream reaches have been inventoried on the Tonto NF. The data has been entered into the Access database on the IBM computer system. The database will be queried to retrieve existing information about streams being evaluated for their flycatcher habitat potential. The data will be presented in tabular form in the Flycatcher Habitat Table (Johnson and Mason, 1999) developed to provide biologists with the fluvial characteristics needed to evaluate suitability or potential for flycatcher habitat to exist. Streams being surveyed for habitat potential that are not included in the database can be inventoried using standard Tonto NF inventory methods. The data from the surveys will be incorporated into the Flycatcher Habitat Table once the inventory is complete. The data presented in the table and the habitat guidance criteria addressed by each of the fluvial characteristics listed are displayed in the table below.

FLUVIAL FEATURES	PHYSICAL HABITAT CRITERIA ADDRESSED
Flow Regime	Presence of perennial flow, surface water, or saturated soil in or adjacent to nesting areas from April through September
Width of bankfull channel Mean depth of bankfull channel Width/depth ratio Floodplain width Valley bottom width Entrenchment ratio Stream type Channel gradient	Wide and shallow stream channels associated with well-defined floodplains and broad valley bottoms. Streams are slightly entrenched with well-defined meanders and riffle/pool bed features.
Floodplain width (from above)	Tree and shrub patches should be capable of extending more than three or four tree widths in depth from the active channel.
Floodplain width (from above) Reach length Channel gradient (from above)	High gradient streams should not be ruled out if they have potential for backwater and associated riparian areas at least 0.5 ha in size.

Location and elevation of inventoried reaches and an assessment of the potential for "F" and "Bc" stream types to evolve the physical features needed for flycatcher habitat, within reasonable time frames (20 – 30 years), will also be provided. This assessment will be at best an educated guess. The sequence of evolving from these stream types to stream types with potential to support willow flycatcher habitat is dependent on the occurrence of stream discharges with sufficient magnitude to erode banks, and shape gravel and cobble bars. Timing of these discharges is dependent on climate which is difficult to predict.

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Procedures for Identification and Designation of Southwestern Willow Flycatcher Habitat

Tonto National Forest

by

Debbie Lutch and Mike Ross

April 6, 2000

Biologists have the tools (guidance criteria, other literature, surveys, etc.) to determine suitable and occupied southwestern willow flycatcher habitat; however, it is often difficult to assess the potential of an area to produce habitat or predict rates of recovery where riparian areas are degraded or have been altered through past management. The absence of trees or dense, multistoried stands of woody vegetation does not mean that an area is not capable of producing high quality habitat. If conditions are favorable, an area may respond rapidly and produce vegetation that meets suitable habitat requirements within five to ten years. Due to limited amount of suitable habitat on the Forest, identification of areas that have the potential to produce suitable habitat becomes a critical step in the recovery of the southwestern willow flycatcher. Areas identified as potential habitat require elimination of management actions which are preventing the progression of the vegetation/area toward suitability.

It is often difficult to determine the potential of degraded riparian areas. Biologists must rely on the help of other watershed specialists to help predict the potential vegetation and other conditions which will occur in the area in the future under protection. The following steps should be used by the biologist in making a determination of potential or current suitability of the habitat. The biologist will only make the determination of the potential of an area in conjunction with a team consisting of the riparian ecologist, hydrologist and soil scientist (where appropriate).

Step 1: All riparian areas within or adjacent to range allotments and other project areas within the elevational range of the flycatcher should be evaluated for their potential to produce habitat for the species. For each drainage, determine if the riparian area is currently occupied by southwestern willow flycatcher, is within designated critical habitat, or is currently suitable based on the evaluation criteria, literature, surveys or other sources.

Step 2: If the drainage or riparian area is not currently occupied or is not designated critical habitat, request that the stream channel characteristics be evaluated by the Forest Riparian Ecologist and Hydrologist. Stream channel characteristics identified in Southwestern Willow Flycatcher Fluvial Characteristics (Loomis et.al. 2000) and the Flycatcher Habitat Table (Johnson and Mason 1999) will be used as the basis for a determination of the potential of the area to produce suitable habitat for the southwestern willow flycatcher. In severely degraded areas where upland conditions may be affecting riparian area potential, request an evaluation of upland conditions by the soil scientist. A joint field visit to the riparian area should be made by the team if the area has not been previously evaluated.

Step 3: Based on field data and the team evaluation, use the following flow chart to determine the habitat category for a riparian area or stream reach:

Riparian area is within designated critical habitat (Verde River, above Horseshoe Reservoir) ----------> **Critical Habitat**

Riparian area has been identified as occupied habitat (Tonto Cr/Salt River confluences w/ Roosevelt Lake) ----------> **Occupied Habitat**

Riparian area currently meets the definition of suitable habitat in FS Guidance Criteria ----------> **Suitable Habitat**

Riparian area may or may not currently meet the definition of potential habitat in FS Guidance Criteria (and BLM Criteria) but the physical attributes of the site, availability of water and existing vegetation is capable of producing suitable habitat conditions rapidly (within approximately 10 years) with exclusion of limiting factors ----------> **Potential Habitat**

Riparian area does not currently meet definition of potential habitat (see above) and most physical attributes, availability of water, existing vegetation, upland conditions, etc. preclude the formation of suitable flycatcher habitat for 10-30 years ----------> **Lomg-term Potential***

Riparian area does not currently meet definition of potential habitat (see above) and based on current condition, physical attributes, availability of water and existing vegetation precludes the formation of suitable habitat ----------> **Unsuitable Habitat**

***Long-term Potential Habitat, with potential to become suitable within 20-30 years**: Should **not** be considered potential habitat for purposes of determining effects to the flycatcher using the Guidance Criteria, but should be identified as a high priority for riparian area improvement to move it toward flycatcher habitat as quickly as possible. This category would be used just so we can differentiate an area with the predicted capability to produce suitable habitat, versus an area that probably never would. This category would be a lower priority for expenditures if funds were limited, but should still receive management emphasis which moves the area toward suitability as quickly as possible. This category would be important in terms of coming up with alternatives during the NEPA process.

APPENDIX 4 - DEFINITIONS

ANIMAL UNIT MONTH (AUM): The amount of forage required by an animal unit for one month. An animal unit is defined as a mature (1,000 pound) cow or equivalent, based on an average consumption rate of 26 pounds of forage dry matter per day (Society for Range Management, 1989).

CONSERVATIVE USE (FORAGE UTILIZATION): Forage utilization is maintained on key forage species between 30 and 40% or less of annual forage production by weight for herbaceous perennials and 50% or less on woody browse species. Qualitative indicators of conservative use can be described by the following; forage plants have abundant seed stalks; areas more than a mile from water show little use; about one third to one half primary forage plants show grazing on key areas (Holechek and Galt, 2000).

CRITICAL AREA: Those which must be treated with special consideration because of inherent site factors, size, location, condition, values, or significant potential conflicts among uses (Society for Range Management, 1998). Riparian areas and locations where listed species occur are examples of critical areas on the TNF.

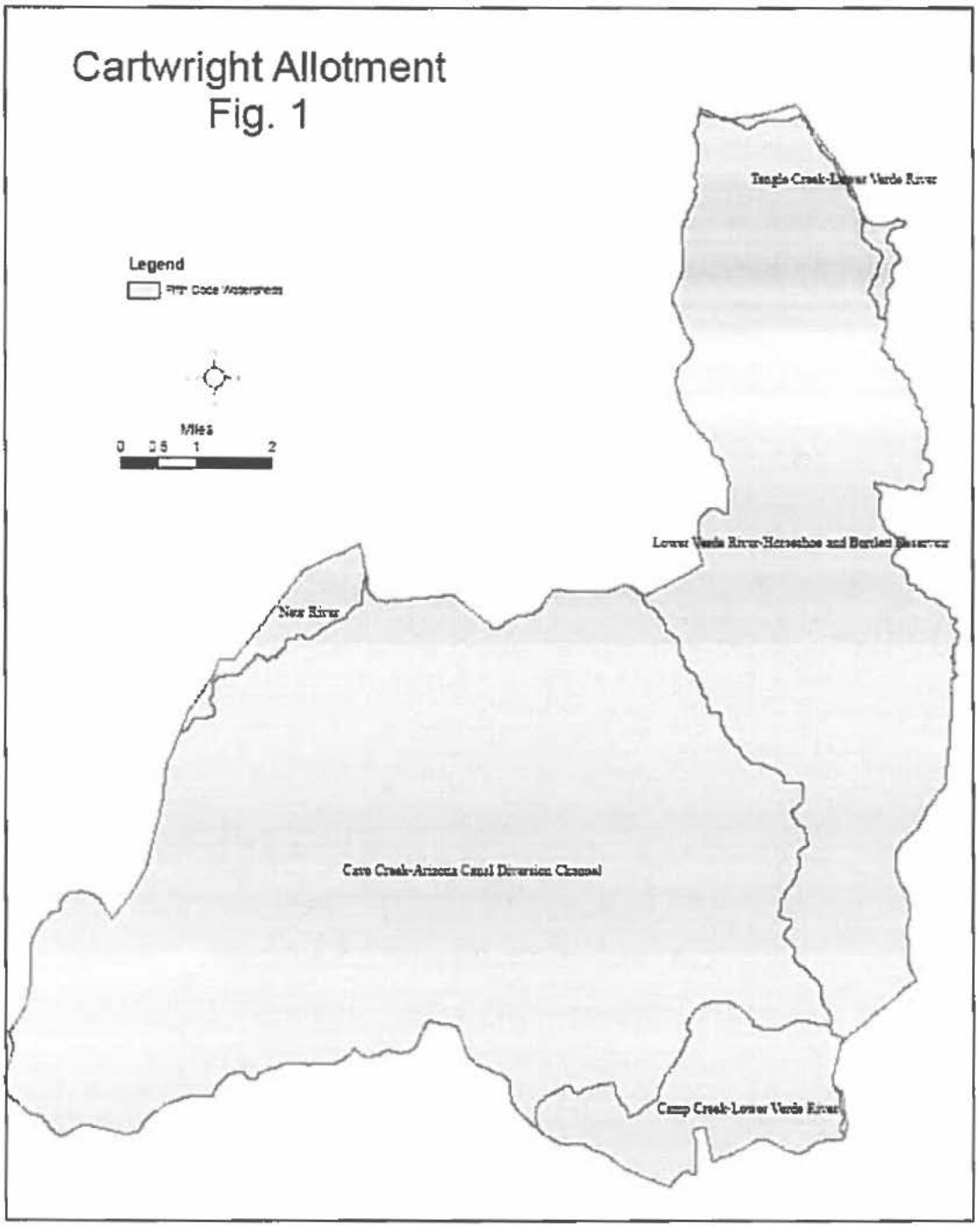
FORAGE UTILIZATION: The portion or degree of the current year's forage production that is consumed or destroyed by animals (Society for Range Management, 1998). The term may refer to a single plant species, a group of species, or to the vegetation community as a whole (must be measured at the end of the growing season for the species or vegetation community for which utilization is being determined).
KEY AREA: "A relatively small portion of a range selected because of its location, use or grazing value as a monitoring point for grazing (Society for Range Management, 1989)." Key areas should be located within a single ecological site or plant community, be responsive to management actions and be indicative of the ecological site or plant community they are intended to represent (Interagency Technical Reference, 1999).

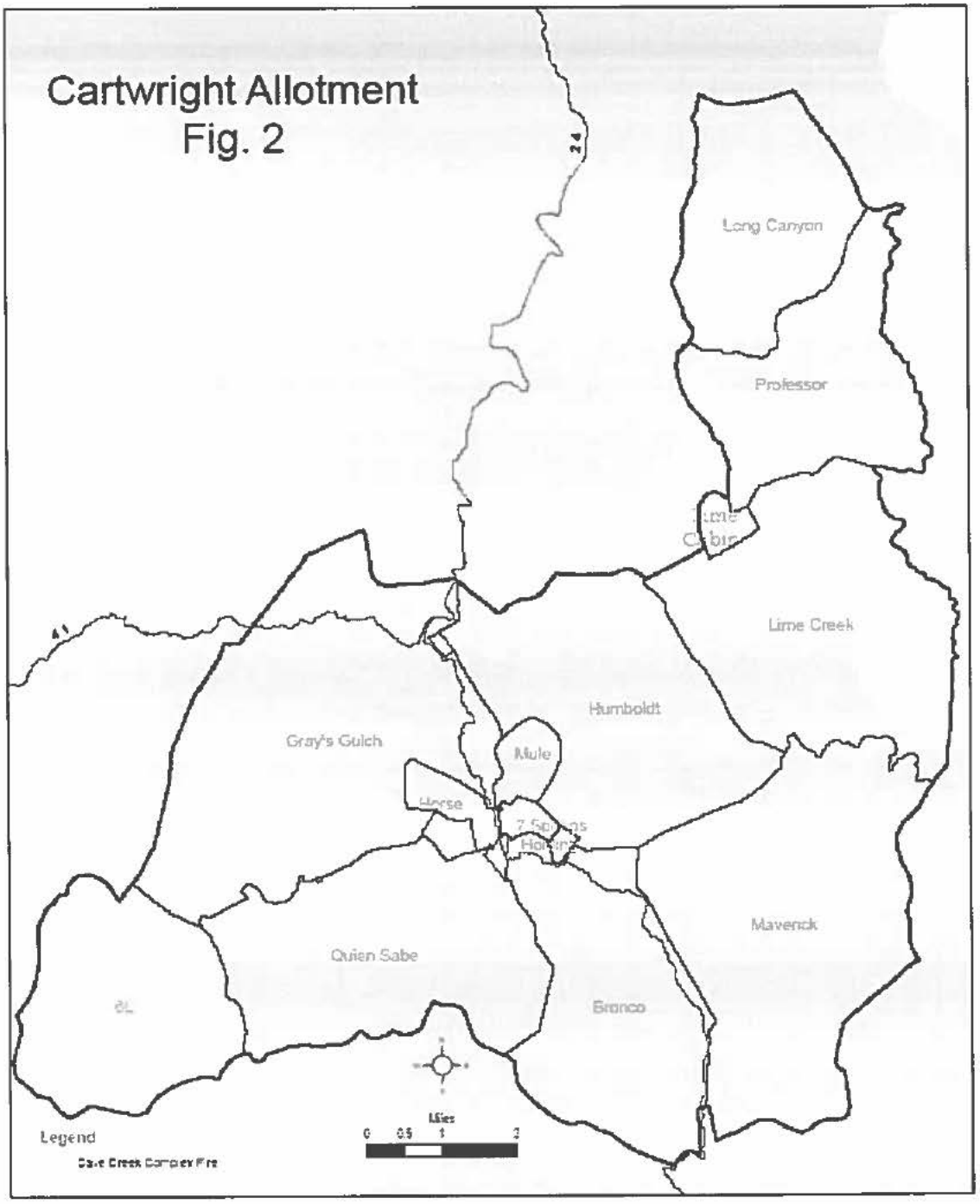
KEY FORAGE SPECIES: A forage species whose use serves as an indicator to the degree of use of associated species, and because of its importance, must be considered in any management program (Society for Range Management, 1989).

RIPARIAN AREA: The interface between terrestrial and aquatic ecosystems that make up a mosaic of land forms, communities, and environments within the larger landscape (Gregory et al., 1991; Whitney, 1998).

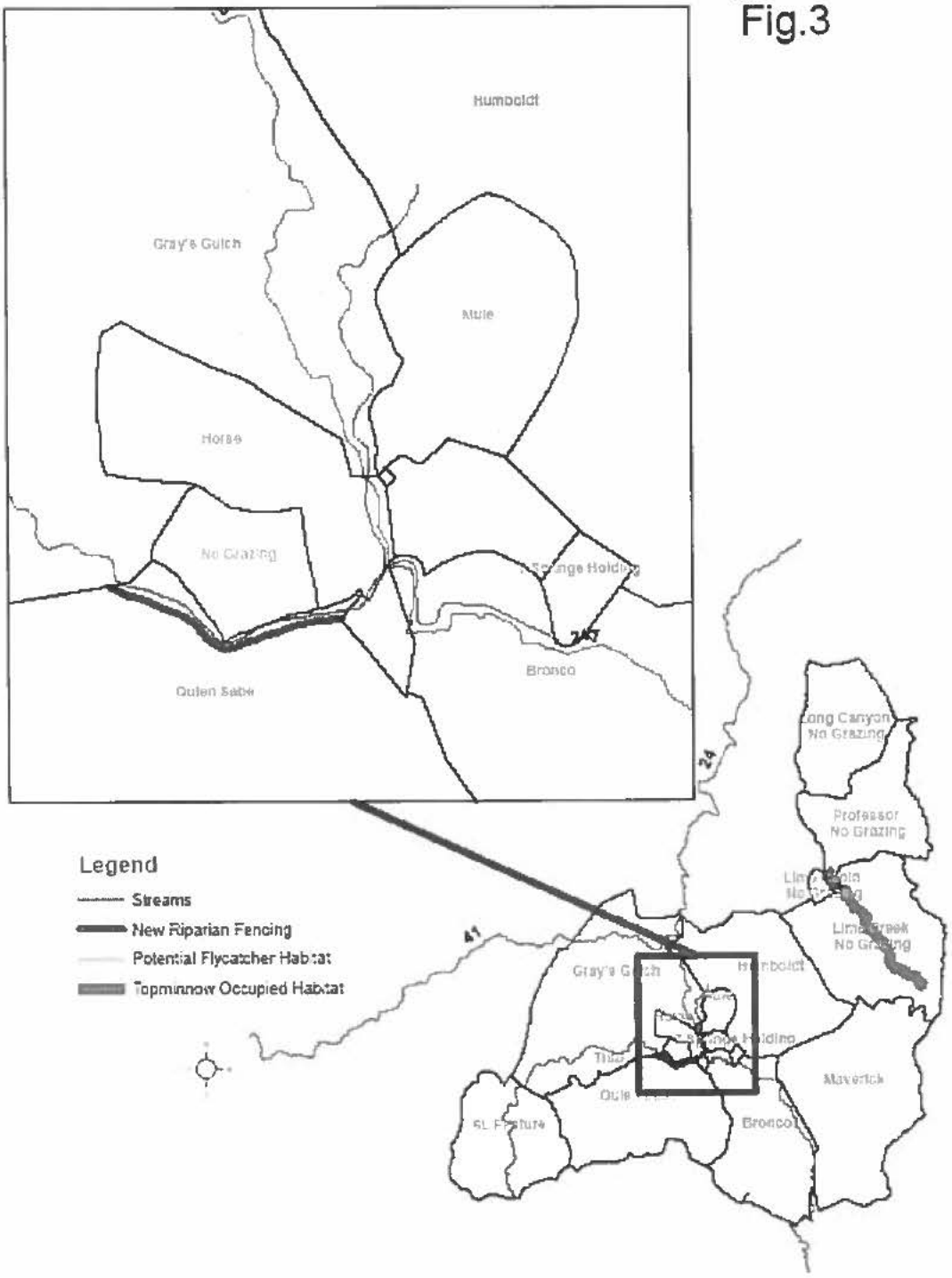
SEASONAL UTILIZATION: The percentage of the forage produced in the current season, to date of measurement, removed by grazing (Smith et al., 2005).

FIGURES


Cartwright Allotment
Fig. 1
Legend
Miles
0 0.5 1 2
Tangle Creek-Lower Verde River
Lower Verde River-Horseshoe and Bartlett Reservoir
New River
Cave Creek-Arizona Canal Diversion Channel
Camp Creek-Lower Verde River


Cartwright Allotment
Fig. 2
Long Canyon
Professor
Lime Creek
Humboldt
Gray's Gulch
Mule
Horse
Mavenick
Quien Sabe
Bronco
Legend

Cartwright Allotment
Fig.3



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