BIOLOGICAL ASSESSMENT

Informal Ongoing Grazing Consultation for 33 Allotments

Tonto National Forest

Prepared by: _____ *Date: February 2007*

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Introduction

This Biological Assessment (BA) addresses the effects of ongoing livestock grazing within 33 allotments on federally proposed, threatened, and endangered, species or their habitats, on US Forest Service (USFS) land (Map 1). This BA encompasses 832,302 acres on the Tonto Basin, Globe, Payson, Pleasant Valley, and Mesa Ranger Districts of the Tonto National Forest (TNF).

Threatened, endangered, and proposed species are designated by the US Fish and Wildlife Service (USFWS) and are managed under the authority of the Endangered Species Act (PL 93-205, as amended) and the National Forest Management Act (PL 94-588). The Endangered Species Act requires federal agencies to ensure that all actions which they "authorize, fund, or carry out" are not likely to jeopardize the continued existence of any threatened, endangered, or proposed species or their habitat. Agencies are further required to develop and carry out conservation programs for these species.

This BA and Section 7 consultation will reference the "*Framework for Streamlining Informal Consultation for Livestock Grazing Activities"* (USFS, 2005a), referred to through the remainder of this document as "Framework". In addition to the Framework, publications referenced for the life history, habitat description, distribution, effects analysis, recovery status, and baseline for each species include, but are not restricted to, the BO for ongoing and long-term grazing on the TNF (USFWS, 2002a), the BO for ongoing livestock grazing activities for Southwest Region (USFWS, 1999) and the BO for Eleven Land and Resource Plans for the Southwestern Region (USFWS, 2005a).

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. Under this policy, limits on timing, intensity, frequency, and duration of livestock grazing are set in Environmental Assessments which reflect Allotment Management Plans (AMP). 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, documents such as the TNF Restocking Guidelines and TNF Drought Policy (Appendix 6) will be incorporated into adaptive management strategies. These documents 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 the Action

The proposed action is to provide grazing opportunities and improve or maintain range and watershed conditions on 33 grazing allotments by employing conservative use (see *Definitions*) 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 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 take place 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 Tonto varies and may be highly erratic both within and between years. Growing seasons tend to be bimodal at the lower elevations, but there is one clearly defined growing season at higher elevations. The maintenance of residual biomass to ensure plant vigor and ground cover on all grazed rangelands 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*) 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 over multiple years, a change in management practices may be warranted (Smith et al., 2005). 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*) 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 TNF. 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.

Monitoring

The monitoring discussed in this document is designed to provide for adaptive management of rangelands on the TNF and consists of implementation and effectiveness monitoring. Implementation monitoring can be done using a variety of methods and is designed to provide information that will enable decision-makers to practice adaptive management and make necessary changes needed for plant development and recovery and assess physical improvements to allotments. Effectiveness monitoring documents whether management actions are having the expected progress towards achieving resource management objectives and is used to track upland vegetative and soil condition over the long-term.

A key area is “a relatively small portion of a range selected because of its location, use or grazing value as a monitoring point for grazing. 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.” (Society for Range Management, 1998). Critical areas are

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). In general, riparian areas (see *Definitions*) and locations where listed species occur are examples of critical areas on the TNF. Range conservationists, biologists, other FS personnel, and permittees will agree on critical areas for each allotment.

Monitoring will occur at key areas in a grazing unit as appropriate. Key area monitoring examines upland range sites and assesses changes in ground cover, relative composition of perennial forage plants, which indicates range condition and trend. Data will be collected in upland areas using a variety of methods. Range conservationists, biologists, other FS personnel, and permittees will collect and provide data to district rangers. In addition, the FS in conjunction with the permittee will conduct planned inspections.

Critical areas will also be monitored throughout the season or year and use will be adjusted if conservative use levels are exceeded. Monitoring these areas will be conducted during the grazing season, as it is important to ensure that sufficient residual vegetation and streambank integrity (where appropriate) are maintained to mitigate flood disturbance throughout the year. Monitoring will be conducted along key stream reaches within the riparian area, which should be selected with an interdisciplinary team (i.e. riparian ecologist, biologist, hydrologist, range staff, grazing permittee).

In uplands outside of critical areas, adaptive management will be conducted if utilization is exceeded or analyses indicate that range conditions are not improving due to our management. This will be accomplished by adjusting one or more aspects of grazing (intensity, timing, frequency, or duration of grazing). Re-initiation of consultation with the USFWS will be conducted if utilization levels are consistently exceeded in critical areas.

Data will be collected in riparian areas using a variety of methods. Range conservationists, biologists, other FS personnel, and permittees will collect and provide data to district rangers. Other data may be collected based on the TNF Riparian Area Management Utilization Guidelines (USFS, 2002) or the most current version of this document. This document identifies use levels in riparian areas that are not strict threshold benchmarks, but rather advisory information that informs managers and serves as a communications tool with grazing permittees and other partners to achieve better understanding and concurrence of grazing effects. USFS (2002) states:

- For obligate woody riparian species, limit use to < 50% of terminal leaders on the top 1/3 of plants that are accessible to livestock (< 6.0 ft tall).
- For herbaceous species within riparian habitats, limit use to < 50% of plant species biomass.
- Where alterable stream banks are present, limit physical impacts to <20% of the bank.

The TNF Plan (USFS, 1985) states that use will not exceed 20% annual growth by volume in woody species within all riparian areas. 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 equivilant to approximately 20% of annual growth by volume.

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).

Allotment Descriptions

The Tonto Drought Policy (USFS, 2001), Region 3 Drought Policy (FSH 2209.13), and Re-stocking Guidelines (USFS, 2003) are part of this proposed action for all allotments and will be utilized annually during drought conditions to determine if cattle can be grazed on the allotment, the number of cattle that may be grazed and the pastures that will be used. The proposed action consists of grazing at conservative use levels. This action will continue until the completion of the environmental assessment process for an AMP which will be incorporated into Part 3 of the Term Grazing Permit and/or until such time further site-specific analysis is completed. In all cases, livestock rotations will be based on individual pasture assessments of riparian, range and soil conditions as outlined in the *Monitoring* section above. The number of livestock listed for each allotment are the current maximum permitted numbers in AUMs (animal unit months, see *Definitions* above), the actual number on the ground may be lower. This number may change over time based on enviromental conditions, future range

improvements, or as more current range data becomes available. Soil condition was assessed by using the Soil Condition Guide presented in the Southwestern Regional supplement to the Forest Service Manuel on Soil Quality Monitoring (FSM 2500, Draft) and was based on data from Terrestrial Eosystems Surveys (TES), areas where soil condition data were collected for project specific NEPA, and areas with little site specific data where Digital Elevation Model (DEM) slope class maps and data from the General Ecosystem Survey (GES) were used to assess soil condition. Range condition and trend data has been gathered sporadically over the past forty years. Recent range condition and trend data is not available for all allotments. If available, the most recent information is included in this document. For all allotments, best management practices will be followed. Some allotments are combined for the purposes of this analysis because they are managed as one unit. Most of the permits have had significantly reduced stocking rates since 2002 in compliance with the Tonto National Forest Drought Policy. The following descriptions reflect past management direction as provided for in AMPs.

Armer Mountain

The Armer Mountain Allotment is located on the Pleasant Valley and Tonto Basin Ranger Districts and consists of approximately 30,000 acres north of Theodore Roosevelt Lake (Map 2). The maximum permitted number is 2,996 AUMs. The allotment has not been stocked from 2003 through 2006. A total of 56%, 27%, and 17% of soils are in satisfactory, impaired, and unsatisfactory condition, respectively. No recent range condition/trend information is available for this allotment.

Armer Mountain is adjacent to the Buzzard Roost Allotment on the Pleasant Valley Ranger District on the north, the Dutchwoman and Greenback Allotments on the west, the currently vacant A-cross Allotment on the east, and Roosevelt Lake to the south. The elevation varies from 6,500 feet in the Sierra Anchas on the northern end of the allotment to 2,100 feet at Theodore Roosevelt Lake on the southern section of the allotment. Vegetation consists of mostly desert scrub and desert grassland species. Chaparral is very common on the steeper slopes. Ponderosa pine can also be found in higher elevations. Topography consists of rolling mountains at the lower elevations getting very steep and rough with the rise in elevation. There are two main drainages located on the allotment. These are Parker Creek and Reynolds Creek. Parker Creek drains directly into Roosevelt Lake; Reynolds Creek is a tributary of Workman Creek which flows to Salome Creek before entering Lake Roosevelt. Soils are shallow and mostly a sandy loam with some heavy clays on the tops of ridges. The Armer Mountain Allotment is mostly within the Upper Salt River – Theodore Roosevelt Lake 5th Code watershed, with the northern end of the allotment in the Salome Creek 5th code watershed.

There are four pastures with a rest-rotation grazing system. Each pasture receives rest one year in four years. The Hopkins Pasture will be used from June through November, one year out of three. The Salome Pasture will be utilized from December through May every other year with summer rest nine years out of ten. Round Mountain will receive summer rest seven years out of ten. Three of the seven years will include spring/summer rest back to back. Schell Pasture will receive eight summers rest back to back out of ten years.

The Lake Bed Pasture will be utilized by the entire herd only when Roosevelt Lake has been drawn down sufficiently to provide adequate forage for the entire herd. On an alternating year basis the Lake Bed Pasture and the Bull Pasture will be utilized as Bull Pastures to continue the present controlled breeding program. During regular grazing season all adult livestock will be removed from all rested pastures with the exception of the above mentioned Lake Bed Pasture.

The Boyer and Jack Shoe holding pastures will be utilized during round-up for sick animals or for

permitted horses. When not being used for these purposes the pastures will be clear of all livestock.

Bar T Bar

The majority of the Bar T Bar Allotment is located on the Tonto Basin Ranger District west of Tonto Creek on the southern part of the Mazatzal Mountains (Map 3). A small portion of the allotment is on the Cave Creek Ranger District. The allotment consists of 34,215 acres with a maximum permitted number of 5,326 AUMs. The allotment has not been stocked from 2002 to 2006. A total of 64%, 19%, and 18% of soils are in satisfactory, impaired, and unsatisfactory condition, respectively. No recent range condition/trend information is available for this allotment.

Elevations on the Bar T Bar Allotment range from 3,000 feet at Hardt Creek, to 7,300 feet at the top of the Mazatzal Mountains. Vegetation consists of Sonoran desert scrub and semi-desert grasslands at lower elevations transitioning to chaparral and ponderosa pine at higher elevations. A large majority of the chaparral and ponderosa pine on the allotment burned in the 2004 Willow Fire. This included all of the pastures west of highway 87, Bull, South Bull, Deer Creek, Barnhardt, and South Fork Pastures. The majority of the Bar T Bar Allotment is in the Rye Creek- Tonto Creek fifth code watershed with a small portion on the southern end of the allotment in the Gun Creek - Tonto Creek fifth code watershed.

The 1987 AMP includes a six-pasture rest-rotation grazing system. Livestock rotations will be based on individual pasture assessments of riparian, range and soil conditions. The AMP calls for the use of West and East Gold Creek, Upper and Lower Barnhardt, Deer Creek and Clover Pastures. This grazing system allows each pasture to receive four years back-to-back, spring-summer rest out of every six years. It also allows for summer rest for five consecutive years and spring rest for five consecutive years.

Bar X/Haigler Creek/Young

These three allotments are located on the Pleasant Valley District and are managed together under one livestock operation (Map 4). The total size is about 25,000 acres with a maximum permitted number of 6,177 AUMs. Range condition is 80% good to fair, and 20% in poor condition, with a 60% upward and a 40% stable trend. This range condition assessment comes from Production/Utilization studies conducted in 1984, 1985, 1986, 1987, and 1995. Data from the 1994-1995 production and utilization study indicated that use with permitted numbers is improving herbaceous plant densities, diversity, and vigor. Multiple transects were read within the allotment in 2004. Vegetation condition rated fair to good within the Bar X, Grasshopper, Pine, and West Hole Pastures, while ratings were poor for Lower Dry Creek, Oxbow, and Cross Y Pastures. Soil condition was fair for these pastures with the exception of Oxbow, West Hole, and Haigler Pastures which rated poor. Trend for both vegetation and soil condition was stable.

The Colcord Allotment has historically been part of this allotment complex, but it is not grazed due to lack of forage capacity, and because the Heber-Reno Sheep driveway is not excluded (fenced) from this allotment. The decision not to graze this allotment came out of the current AMP that was approved on 1/13/1982. When the current AMP is revised, the status of the Colcord Allotment (Turkey Peak, Lost Salt pastures) could be revisited. The Colcord Allotment is about 4,700 acres in size.

Thirteen existing pastures will be grazed in a short duration grazing system. Five of the existing pastures are commonly used in the fall/winter (Round Mountain, Oxbow, Cross Y, Haigler Creek, Little Bar X) under a deferred system of management where each pasture is grazed each winter; however each pasture is grazed at a different time period each winter. These pastures are grazed in winter mainly because perennial streams are accessed in the pasture (Haigler Creek, Cherry Creek), or there is an abundance of

browse species present (Oxbow pasture). Each pasture is used for 2 weeks to 2 months, and will receive complete warm growing season rest every year. The other 8 pastures are used during spring and summer in a deferred rotation grazing system. These pastures are Westhole, Grasshopper, Pine, Lower Dry Creek, Upper Dry Creek, Steer, Windmill, and Glasscock. Each pasture is commonly used for 2 weeks to 1 month, so there is partial growing season rest every year.

Capitan

The Capitan Allotment on the Globe Ranger District is 12,154 acres located on the east facing slope of the Pinal Mountains on the very southeastern part of the TNF below the town of Globe (Map 5). To the east is the San Carlos Reservation. The maximum permitted livestock numbers are 2,809 AUMs. The allotment was not stocked in 2002 and 2003. Transects were read in 2006 on Harvey, Hayes, City Well, and Hog Trough Pastures at which time vegetation condition was rated poor to very poor. Soil condition was also poor for all pastures mentioned above with the exception of the Harvey Pasture. Summaries indicated that perennial grasses were lacking in most areas and mortality was observed in some species including snakeweed and prickly pear. The majority of habitat on the Capitan Allotment is Sonoran paloverde, chaparral, and mixed oak. Elevations range from 3,700 to 6,700 feet.

Almost all of the allotment drains into Gilson Wash to the east. Highway 77 runs north and south and divides the allotment into an east and west side. The allotment is divided into six pastures, four of which are primarily chaparral with areas of open grassland, and the remaining two (Hayes and City Well Pastures) of a semi-desert grassland type. In addition, there are a number of smaller holding and horse pastures. The six pastures are grazed under a rest-rotation system of management where each of the four browse pastures will receive one year growing season rest (both the spring and summer growing seasons) in a four year grazing cycle. The two grassland pastures will receive growing season rest each year.

Center Mountain

Center Mountain Allotment on the Pleasant Valley Ranger District is 9,287 acres (Map 6) and has a maximum permitted number of 737 AUMs. There were no livestock on the allotment in 2003. Range condition data was taken from a 1997 Range Trend Survey. The results may be misleading, however, since all three clusters are located in an open Woodland/Grassland habitat type, which is not the major habitat type on the allotment, but has received a disproportionately high amount of use over the years. Data from these 3 sites would indicate that 100% of the range vegetation is in very poor condition, with watershed condition rated fair on 67% and poor on 33%, with 90% of allotment acres in an upward or stable trend. The vegetation condition rating is based on the Parker Three Step methodology, which is a commodity rating based on cattle forage preferences. The “very poor” vegetation conditions observed are due to a lack of forage species diversity, since the sod-forming grass, curly mesquite, provides nearly continuous groundcover at the cluster sites. The condition of the other major habitat types on the allotment is probably higher than “very poor”. A total of 90%, 8%, and 2% of soils are in satisfactory, impaired, and unsatisfactory condition, respectively. The permit is for cow-calf, yearlong. Entire allotment is used as a winter pasture. In summer, the allotment is divided into a north (Blackbrush) and a south (Devil’s Chasm) unit, which are grazed during alternate years. The allotment has a new management plan approved in 2000 with new pasture movement standards.

Once allowable utilization levels are met in one summer pasture, the herd is moved to the other summer pasture. If use levels are not exceeded during the summer use period, then the herd will remain in only one summer pasture. The following summer the herd would begin in the alternate summer pasture. The

herd is scattered throughout the allotment during the winter. Proper distribution is important in order to not exceed proper use levels.

The allotment has been de-stocked or very lightly stocked since early spring of 2002, and improved management in the years prior to de-stocking has lead to improvement in range condition witnessed during recent allotment inspections. Most of the allotment is composed of chaparral and pinyon/juniper vegetation, which should remain static in condition unless acted upon by fire or mechanical treatments.

This allotment went through NEPA in 1999 and a 52% reduction of numbers was implemented. An 88% reduction in use during the growing season was also implemented. The lower half of Cherry Creek has been incorporated into a riparian pasture that will be rested until 2007 and then grazed for 2 months during the winter. Utilization of riparian vegetation by livestock can be strictly controlled in the south half of Cherry Creek since it is part of a riparian pasture. Additionally, the upper portion of Cherry Creek will be monitored and if unacceptable utilization occurs, an exclusion fence will be constructed to exclude livestock use. Other perennial waters on the allotment consist of steep canyons that originate in the Sierra Ancha Mountains and drain into Cherry Creek. These drainages have very limited access by livestock due to steep terrain and boulder-type substrate. The access is mainly limited to the crossing of FDR 203. Riparian monitoring has been conducted on Cherry Creek several times from 1998 to 2002 with no incidence of allowable use being exceeded.

Coolidge Parker

The Coolidge/Parker Allotment on the Globe Ranger District is 9,100 acres in size (Map 8). The maximum permitted number of livestock is 781 AUMs. The allotment was not stocked between 2000 and 2003. Reading of Parker Three-Step transects in 1991 found that Antev Pasture condition was poor in north end and fair in south end of with an apparent upward trend as a whole. One transect in this pasture was revisited in 2006 and vegetation condition was identified as poor and trend stable with soils in fair condition and stable trend. The Exchange Pasture was in fair condition with upward trend in 1991, but in 2006 data from one transect indicated poor vegetation and soil condition with stable trend. East Harvey Pasture had an overall upward trend, West Harvey Pasture at the lower elevation areas were in poor condition. Sixty-six and Hayes Pastures were in fair condition with upward trend. One transect each from the Windmill Gap and Home Pastures were read in 2006 at which time vegetation condition was very poor and poor, respectively, and soil condition was fair. Trend for vegetation and soils were stable. Dominant forage species was fairy duster (*Caliandra eriophyla*). Overall, surveys indicate that the allotment is dominated by shrubby species and perennial grasses are lacking.

The Coolidge Parker Allotment ranges from 3,700 to 7,800 feet in elevation. It is mostly chaparral with ponderosa pine habitat at the higher elevations. The allotment is divided into eight pastures, and managed under a rest-rotation system of management where each pasture receives one year's rest out of four. In general, the seven lower and middle elevation pastures are used during the fall, winter, and spring months. The eighth pasture, the higher elevation Mountain Pasture, is used every other year and only during the summer months since it is unavailable for grazing in the winter due to snow conditions.

The permittee on the Coolidge Parker Allotment has developed a conservation plan and a signed coordinated resource management agreement with the Tonto Natural Resource Conservation District, NRCS and the USFS.

Crouch Mesa

The Crouch Mesa Allotment is located on the Pleasant Valley Ranger District and is 7,510 acres in size (Map 9) with a maximum permitted number of 955 AUMs. In 2003 through 2005 the allotment has not been stocked, but in years prior to 2002 was typically stocked within 85% of maximum permitted levels. A 1994 rangeland trend study shows 63% of the range vegetation is in fair to good condition, and 36% in poor condition, with 27% in an upward trend and 73% in a stable trend. Watershed conditions from this 1994 trend study show 54% of acreage with good to excellent watershed condition, with the remaining 45% rated in fair condition. Trend for this component is 27% upward trend, 64% stable trend, and 9% downward trend. Soil conditions are 61%, 21%, and 17% satisfactory, impaired, and unsatisfactory, respectively, as rated through Terrestrial Ecosystem Survey.

There are 3 summer pastures (Mesa, Deadman, Scarlet) grazed under a rest, deferred-rotation system of grazing management where two pastures are grazed each summer and one pasture is rested each summer. Grazed pastures are used during a different time period in alternate years. Each summer pasture receives 1 complete growing seasons rest every 3 years. There is one winter pasture that is used every year (Brewer). The winter use period is typically from November 1st through May 15th. Pasture management is from the AMP that was approved on 1/08/1988. Utilization standards proposed are lower than those in the AMP.

Cherry Creek is a perennial stream with accessible reaches found in the Deadman summer pasture. Crouch Creek has some accessible perennial water found at seeps and springs, and it is found in the Brewer winter pasture.

Selection process for key forage plants and key grazing areas are defined in the Forest Service Region Three Rangeland Analysis and Management Guide dated June 1997 and the 1996 Interagency Technical References. Grazing will be managed to improve or sustain satisfactory watershed, riparian and wildlife habitat conditions while providing forage for livestock and wildlife. A primary objective on upland watersheds will be to maintain or improve the hydrologic conditions and soils to enhance the productivity, ecological functioning and sustainability of the watersheds.

Del Shay

The Del Shay Allotment on the Tonto Basin Ranger District covers 14,163 acres (Map 10) with a maximum permitted number of 2,450 AUMs. The allotment was not stocked in 2002 and 2003. Soil conditions are 54%, 24%, and 22% satisfactory, impaired, and unsatisfactory, respectively. No recent range condition or trend data is available for this allotment.

The allotment is bordered to the east and south by the Tonto Basin Allotment, to the west by Tonto Creek, and to the north by the 76 Allotment. The elevation ranges from 2600 feet along Tonto Creek to 5800 feet in the Sierra Anchas. The vegetation consists mostly of Sonoran desert scrub at lower elevations, semi-desert grasslands at mid elevations, and chaparral mixed with pinyon/juniper woodlands at higher elevations. The allotment occurs within the Gun Creek- Tonto Creek fifth code watershed.

Management on the allotment is a deferred rotation grazing system with 10 pastures. The cattle are moved to the lower unit in the late winter and spring to take advantage of the winter annuals. With the depletion of annuals the cattle are moved to the upper portion, or above the reef. The reef is a topological break that cattle generally do not cross, though there are several places where cattle can

cross. Late in October the cattle are moved from the upper limit onto the center portion. The cattle remain on this unit until the annuals are prevalent on the lower unit.

Devils Canyon

The Devils Canyon Allotment on the Globe Ranger District is 19,612 acres in size (Map 11) with a maximum permitted number of 5,254 AUMs. The allotment was not stocked from 2002 through 2004. Soils are 72%, 18%, and 10% in satisfactory, impaired, and unsatisfactory condition, respectively. A total of 67% and 33% of the range is in fair and poor condition, respectively with 69% in upward or stable trend. The term grazing permit has an on-off provision attached due to private and State leased lands for cows, year long. The allotment contains some 43 sections, of which 7,520 acres are State land and 432 acres of private land.

Highway US 60 divides the Devils Canyon Allotment into three main pastures, which consist primarily of chaparral/oak woodland vegetation type, and to a much lesser degree (1,100 acres) Sonoran desert scrub. The three pastures are grazed under a rest-rotation system of management with an intensified six month rotation schedule which allows for complete yearlong rest following grazing.

Diamond

The Diamond Allotment on the Mesa Ranger District is 28,889 acres (Map 12) with a maximum permitted number of 8,147 AUMs. The allotment was voluntarily de-stocked July 2002 through 2003 due to drought. The majority of this allotment consists of Sonoran desert, chaparral, and pinyon/juniper habitat. Elevation ranges from 3,100 to 6,800 feet. A portion of the Diamond Allotment was impacted by the Edge Fire.

The following characterization of vegetation and soils was derived from summary data compiled following 3 years of data collection (2003-2005) on the Diamond Allotment. These data were collected by the permittee in conjunction with the University of Arizona Cooperative Extension and Forest Service personnel.

The key area in the Kitty Joe Pasture is located in semi-desert grassland dominated by curly mesquite (31% of vegetation composition). This site burned in the Edge Fire of July 2005, during which time data collection was not completed. Perennial grass diversity at this site was low in 2004. Common species include snakeweed (6%), prickly pear (5%), shrubby buckwheat (5%), mesquite (2%), and purple aster (4%). Approximately 40% of the remaining plant community was comprised of various annual species. The dominant perennial forage species was curly mesquite, which increased about 11% from the previous year (2003). Ground cover composition consists of 42% bare ground, 14% gravel, 6% rock, 27% litter (< ¾ " deep), 6% live vegetation and 5% persistent litter (> ¾ " deep or woody material). Ground cover composition changed little compared to baseline data collected the previous year.

The Ord Pasture site is located in a mixture of both semi-desert and chaparral species. Shrubs make up the majority of the vegetative community and perennial grasses, perennial forbs and annuals, comprise the remaining 25%. The dominant forage species are shrubby buckwheat (10%), menodora (3%), squirreltail (8%), sideoats (4%), Junegrass (2%), and muttongrass (1%). Shrub composition consisted of turbinella oak (38%), snakeweed (17%), and beargrass (9%). Ground cover composition includes 1% bare ground, 10% gravel, 18% rock, 43% litter (< ¾ " deep), 5% live vegetation, 23% persistent litter(> ¾ " deep). This site was significantly affected by the 2002 drought, causing a decline in curly mesquite, sideoats, and shrubby buckwheat. Turbinella oak and squirreltail showed moderate increases while Junegrass, snakeweed, and prickly pear remained stable throughout the past 3 years.

The two key areas for the Diamond Pasture are located in gentle topography in semi-desert grassland. Frequency, dry-weight rank and ground cover data were not collected for KA10 in 2005. The dominant forage on both sites in 2004 was curly mesquite, which is reflected in both frequency and composition. Curly mesquite composition on KA9 was 48% and 46% on KA10 in 2004. Sideoats grama declined moderately on KA9 while remaining unchanged on KA10. Sideoats (2%) and three-awn (3%) are the only perennial grasses that exceeded trace levels in composition in KA9. The composition of other perennial grasses remained stable, changing little over the past few years. Impacts from drought appeared to be minimal in relation to the perennial grasses on both sites. Shrubby buckwheat composition remained stable between years at 12% in 2003 to 14% in 2004. It remained virtually the same on KA10 at 5%. Snakeweed also remained stable at both sites. Ground cover consisted of 11% bare ground, 20% gravel, 14% rock, 38% litter (< ¾ " deep), 12% live vegetation, and 5% persistent litter (> ¾ " deep or woody material) on KA9. On KA10, ground cover composition consisted of 24% bare ground, 31% gravel, 15% rock, 17% litter (< ¾ " deep), 9% live vegetation, and 5% persistent litter (> ¾ " deep or woody material).

This key area is located south of Ram Valley in gentle semi-desert grassland hills. The Sycamore Riparian Pasture was part of the Edge Complex Fire in the summer of 2005. Boulder Creek is located to the south and does contain limited riparian vegetation. Grass diversity at this site is high compared with most other key areas. Key forage species include a variety of perennial grasses and the dominant being sideoats grama (16%). Other common perennial grasses include three-awn species (8%), sprangletop (4%), cane beardgrass (1%), hairy grama (1%), and sand dropseed (1%). Shrubby buckwheat (8%) remained stable post-fire, but snakeweed significantly declined. Important effects from the fire are evident in ground cover as well. The greatest change was bare ground, which increased 30%, followed by a decrease of 15% in ephemeral litter. Ground cover composition consists of 40% bare ground, 23% gravel, 22% rock, 9% litter (< ¾ " deep), 3% live vegetation, and 3% persistent litter (> ¾ " deep or woody material).

Semi-desert grassland is the primary community type of this key area. This site was also burned during the 2005 Edge Complex Fire and is quite similar to KA11 due to its very close proximity. The diversity of perennial grasses is high and include the following species: three-awn (19%), sideoats (16%), hairy grama (4%), sprangletop (3%), cane beardgrass (3%), spidergrass (1%), and a trace of sand dropseed and curly mesquite. Perennial grasses, such as three-awn species in particular, have increased in density. Sideoats has basically remained stable with only a minor increase in abundance. Prickly pear (1%) and snakeweed (0%) declined post-fire. Ground cover composition also reflects the effect of fire with an increase in bare ground and a decrease in litter. Composition of ground cover includes 40% bare ground, 23% gravel, 22% rock, 9% litter (< ¾ " deep), 3% live vegetation, and 3% persistent litter (> ¾ " deep or woody material).

The allotment contains the Diamond, Sycamore Riparian, Bob, Ord and Kitty Joe Riparian Pastures. The Diamond Pasture is utilized alternately with the remainder of the allotment pastures in a modified rest-rotation system. The Diamond Pasture receives winter-spring use (January-June) in one year out of three years. This pasture also receives summer-winter (July-December) use in one year out of three years. During a three year cycle (36 months) this pasture is grazed for two use periods each followed by a 12 month rest period.

The riparian pastures include the Sycamore Riparian and the Kitty Joe Riparian Pastures. These pastures are alternately grazed during the January-March and October-December use periods. During a three year

cycle (36 months) each of these two pastures receive two grazing use periods followed by one 12 month rest period and one 18 month rest period.

The Bob and Ord Pastures are managed for upland forage and as alternates with the Diamond Pasture for portions of the summer growing season. These pastures are alternately grazed during the April-June and the July-September use periods. During a three year cycle (36 months) each of these two pastures receive two grazing use periods followed by one 12 month rest period and one 18 month rest period.

H4

The H4 Allotment is on the Tonto Basin Ranger District and covers a total of 15,704 acres (Map 13) with a maximum permitted number of 2,796 AUMs. The allotment was not stocked in 2003. A total of 61%, 17%, and 22% of soils are in satisfactory, impaired, and unsatisfactory condition, respectively. In April 2006, range condition data revealed at two historical cluster sites, range condition very poor with a downward trend and soil condition poor with a stable trend. These two sites were close to roads, water, and livestock congregation areas. New locations will be established for future monitoring. Six more sites were evaluated with vegetation condition a range of poor to fair with a stable trend and soils condition on 5 sites - fair with a stable trend, and one site poor and downward trend.

The allotment is bordered to the east by Tonto Creek, to the south by the Tonto Basin Allotment, to the west by the Cross F Allotment, on the Mesa Ranger District, and to the north by the Bar T Bar Allotment. The elevation ranges from 7,198 at the top of Mount Ord to 2,500 feet near the confluence of Slate and Tonto Creeks. The vegetation consists mostly of Sonoran desert scrub at lower elevations grading into semi-desert grasslands and open juniper woodlands at mid elevations. Chaparral and Arizona cypress woodlands occur at higher elevations with ponderosa pine forests occurring at the highest elevations. The allotment occurs within the Gun Creek- Tonto Creek fifth code watershed. The Brunson North Pasture (north of Highway 87) burned in the 2003 Willow Fire.

The H4 Allotment has a modified Santa Rita grazing system utilizing each forest pasture for three months and a fourth private land pasture for the remaining three months. The Brunson, Cottonwood, and Beeline Pastures will be used from January 1 to May 31 and from September 1 to December 31 every year. The grazing cycle will consist of three months in each pasture and each pasture will be utilized ever year.

Hardscrabble

The Hardscrabble Allotment is on the Payson Ranger District and encompasses 20,845 acres (Map 14) with a maximum permitted number of 1,680 AUMs. The allotment was stocked in 2002, minimal stocking in 2004, but was not stocked in 2003 and 2005. A total of 57% of the range vegetation rates poor to very poor condition by the Parker Three Step Method that rates the value of the vegetation in terms of cattle forage preference. This rating system does not address ecological health or site potential. The range vegetation trend is 29%, 57%, and 14% in an upward, stable, and downward trend, respectively. Watershed condition as assessed by the Parker Three Step method is 86% fair to good, with 14% rated poor. Observed trend for this component is the same as for the vegetation (29%, 57%, 14% upward, stable, downward trend, respectively). Soil condition as rated by the Terrestrial Ecosystem Survey is 71%, 17%, and 12% satisfactory, impaired, and unsatisfactory, respectively.

A total of 6,828 (32%) of the allotment is ponderosa pine with the remaining being chaparral or juniper. The grazing system used is rest deferred rotation year long with three winter and 5 summer pastures. The Natural Bridge pasture can be used for either winter or summer. In 1986 a non-use agreement was

developed for resource improvement. This non-use agreement reduced the allotment by 16%. This agreement is still in effect. Recent inspections have shown improving conditions. Range condition data for soils and vegetation was collected in 1985.

The Saddle Ridge and Wilderness pastures are grazed under a rest-rotation system of management where each pasture receives one year rest during a five year grazing cycle. The Natural Bridge, Button Flat, and Rock Creek pastures are grazed under a deferred system of management where each pasture is grazed each year; however each pasture is grazed at a different use period each year. Each pasture will receive growing season deferment every other year during a five year grazing cycle. The Pine Pasture is grazed every year during the last half of the summer growing season. The Summer Pastures are: Button Flat, Pine, and Natural Bridge. The Winter Pastures are: Wildness, Walnut, Rock Creek, Saddle Ridge, and Natural Bridge. This management is from the current AMP dated 5-19-86.

Hardt Creek

The Hardt Creek Allotment covers 13,293 acres on the Tonto Basin Ranger District and is bordered to the east by the 76 Allotment, to the south by the H4 Allotment, to the west by the Bar T Bar Allotment and to the north by the Gisela Allotment on the Payson Ranger District (Map 15). The maximum permitted number of livestock is 3,863 AUMs. The allotment has been under “non-use” since 1990 for resource reasons. The soil condition data indicates 23%, 44%, and 33%, satisfactory, impaired and unsatisfactory, respectively. Hardt Creek Allotment is immediately upstream from the Tonto Creek Riparian Unit where grazing is excluded from Tonto Creek from Roosevelt Lake up stream to Gun Creek.

The elevation ranges from 3,971 at Black Mountain on the northern end of the allotment to 2,600 feet near the confluence of Hardt and Tonto Creeks. The vegetation consists mostly of semi-desert grasslands and open juniper woodlands. Small areas of Sonoran Desert scrub occur at the lowest elevations. The allotment is in the Rye Creek- Tonto Creek fifth code watershed with a small portion on the southern end of the allotment in the Gun Creek - Tonto Creek fifth code watershed.

Hardt Creek utilizes a three unit rest-rotation grazing system with 7 pastures. The Mesa Pasture is grazed four months (June through September) every year, the permittee has agreed to exclude the Riparian and Eagle Pastures from grazing year round, and the remaining pastures are deferred every year.

Haystack Butte

Haystack Butte Allotment on the Globe Ranger District is 15,022 acres (Map 16) with a maximum permitted number of 3,263 AUMs. Soil condition for the allotment is 45% satisfactory, 38% impaired, and 17% unsatisfactory. The most recent survey was conducted in 1977, during which a total of 91% of range was in poor to very poor condition. Since this time, however, range condition has improved due to the allotment being managed under rest-rotation system for over 15 years and reduced level of stocking.

Elevation ranges from about 3,000 feet at the Salt River to over 5,000 feet at the highest point on the allotment. Vegetation is pinyon/juniper at the higher elevations and chaparral and desertscrub in the canyon.

The six pastures are grazed under a deferred system of management where each pasture is grazed every year however at a different use period each year. Each pasture will receive growing season deferment

two years during a three year grazing cycle. Due to steep cliffs, the Salt River is not used as part of this allotment.

Jones

The Jones Allotment on the Globe Ranger District covers 11,819 acres (Map 17) with a maximum permitted number of 2,160 AUMs. The allotment was not stocked from 2002 through 2004. Five transects were read on the allotment in 2004. Four of the five transects rated vegetation condition poor or very poor and one rated fair. Soils on the transects were rated fair on four of the five transects and poor on the other. Vegetation and soil trend were rated stable. At the time the allotment was visited in 2004, the lower elevation grassland sites showed much diversity among perennial grasses. The grasses, which included blue grama, curly mesquite, three-awns, sand dropseed, and others, generally showed green-up and some seed production beginning to take place. The three-awns retained many seed heads from the previous year. There was a moderate presence of cured annuals throughout the grassland sites, and die-off was observed on juniper, turbinella oak, and wait-a-minute bush. At the higher elevations, sites were chaparral and dominated by dense stands of manzanita with turbinella oak and some alligator juniper. Access into these sites is very restricted and there are few perennial grasses or forbs in the understory.

Elevations on the allotment range from 3,500 to 6,600 feet. Major habitat types include desert grassland, chaparral, and ponderosa pine.

The Jones Allotment is divided into nine pastures, and managed under a deferred system of management which provides seasonal deferment of use on the winter range, and continuous seasonal use on the summer range. Each pasture will receive growing season deferment one year during a three year grazing cycle.

Lyons Fork

Lyons Fork Allotment on the Globe Ranger District covers 23,886 acres (Map 18) with a maximum permitted number of 3,016 AUMs. The allotment was not stocked in 2002. Soil conditions are 84%, 15%, and 1% satisfactory, impaired, and unsatisfactory, respectively. No recent range condition data is available for this allotment. The Lyons Fork Allotment ranges in elevation from 3,300 to 7,600 ft.

The allotment consists of four main pastures which are grazed under a rest-rotation system of management where each pasture receives one year's growing seasons rest in a four year grazing cycle. The Lyons Fork operation consists of approximately 7,000 acres of State land and 160 acres of land controlled by the Bureau of Land Management. An on/off provision allows the permitted livestock to be combined into one herd, utilizing Forest Service land approximately 70% of the time, and State Land the remaining 30%.

OW

The OW Allotment on the Pleasant Valley Ranger District is a small allotment located at the head of Canyon Creek a tributary that drains through the Fort Apache Reservation into the Salt River 30 miles downstream (Map 19). The permit is for a summer seasonal use only, from June 1 through October 15. The maximum permitted number is 473 AUMs. The allotment was not stocked from 2002 through 2004. A total of 50% and 50% of soils are in satisfactory and impaired condition, respectively with no acres considered unsatisfactory. Prior to the Rodeo-Chediski Fire, range condition was 75% and 25% upward and stable, respectively.

The allotment consists largely of ponderosa pine and meadow habitat. The majority of the allotment was burned in the Rodeo-Chediski Fire. The mixed conifer type found in steep canyons on the face of the Mogollon Rim was burned at high intensities, and very little of this type remains. Much of the ponderosa pine habitat type burned at high enough intensity to kill the trees. Some islands of living trees remain in the allotment. The grassland and riparian areas were affected little by the burn with a few narrow leaf cottonwoods killed by the fire. Prior to the burn range condition was 75% and 25% upward and stable, respectively. With the removal of the forest overstory and increase in herbaceous vegetation the percentage in an upward trend should increase. A total of 50% and 50% of soils are in satisfactory and impaired condition, respectively with no acres considered unsatisfactory.

The grazing system used is a deferred rest rotation with summer seasonal use. There are three main pastures (Mule Creek, Canyon Creek East, Canyon Creek West) and two holding pastures. The pasture rotation schedule is listed each year in the AOP. Typically 2 out of 3 main pastures are grazed each year with one rested, and pasture use is deferred in consecutive years. Pasture rotations can be amended during the grazing season based on adaptive management to actual observed use in riparian areas and uplands.

Canyon Creek and Mule Creek have several exclosures along the stream to reduce herbivory by wild ungulates and cattle along the stream banks. More exclosures have been proposed to exclude elk. Over 90% of Canyon and Mule Creeks are excluded from cattle grazing. Canyon Creek enters the Fort Apache Indian Reservation after leaving the TNF and flows to the upper Salt River over 30 miles downstream.

Range condition data is based on recent inspections and partial re-reading of Parker Three Step clusters in the last 5 years. The recent assessment would indicate that only 20% of range vegetation rates as poor (mainly in the pine type), with the remaining 80% in the fair to good category. Watershed conditions are fair or better over the entire allotment since groundcover has re-established following the fire in 2002. The observed trend over the allotment for both components is 75% upward and 25% stable. Forage production ranges from 1000 to 2000 lbs/acre in the open meadows around the creeks to 100-400 lbs/acre in the pine-type after the thinning of the overstory following the Rodeo-Chediski Fire. Livestock use occurs mostly in the meadows. There has been a substantial increase in herbaceous groundcover in some burned areas due to litter removal and thinning of the tree overstory. Some seeding of grasses was done following the fire. Range inspections are conducted every summer, and these have shown that utilization levels are acceptable in upland areas (less than 40% utilization observed). Riparian areas at Canyon Creek and Mule Creek are monitored each year, and these inspections have shown that cattle use has not caused excessive herbivory on woody and herbaceous riparian vegetation, but sometimes elk use has been excessive, which necessitated the construction of the elk exclosures. Cattle exclosures on Canyon Creek have been in existence since the mid 1980's. Mule Creek and Canyon Creek elk exclosures have been in place since 2002 and 2000, respectively.

Poison Springs/Sierra Ancha

The Poison Springs Allotment on the Tonto Basin Ranger District and Sierra Ancha Allotment on both Pleasant Valley and Tonto Basin Ranger Districts are managed under one permit (Map 20). The combined allotments contain 63,655 acres with a maximum permitted number of 1,224 AUMs. The allotments have not been stocked from 2002 through 2006. For both allotments, the soil condition is 34% satisfactory, 32% impaired, and 34% unsatisfactory. Range condition and trend are not available for these allotments.

The elevation ranges from 7,400 feet in the Sierra Anchas to 2,100 feet at the Salt River. The vegetation consists of Sonoran Desert scrub at lower elevations grading into semi-desert grasslands and open juniper woodlands at mid elevations. Chaparral occurs at higher elevations and steep slopes. Mixed conifer forests and ponderosa pine forests occur at the highest elevations. The Salt River runs through the middle of the Poison Springs Allotment but it is not accessible to cattle. The allotments are primarily within the Upper Salt River - Theodore Roosevelt Lake fifth code watershed with portions extending into the Pinto Creek, Pinal Creek, Cherry Creek and Salome Creek watersheds. The main drainages on the allotments are Chalk Creek, Coon Creek, Griffin Wash, and Pinto Creek all of which drain into the Salt River.

The grazing system employed for Poison Springs is to use 12 pastures based upon the Santa Rita Grazing system. The Intake System [Unit] and the Basset System [Unit] are based on deferred grazing or on seasonal use respectively. For the Sierra Ancha Allotment six pastures are grazed under a rest-deferred grazing system. Each pasture receives rest during the annual growing seasons each year with use on pastures 2-5 months per pasture each year, and at the minimum complete rest 1 in 6 years.

Potato Butte

Potato Butte Allotment on the Pleasant Valley Ranger District contains 2,800 acres (Map 21) with a maximum permitted number of 950 AUMs. The allotment was not stocked in 2002. A 1994 rangeland trend survey found that the range vegetation rates in fair condition over 100% of the allotment, with 75% in an upward trend and 25% stable. Watershed condition was rated fair or good over 100% of the allotment with the same observed trends. Totals of 70%, 15%, and 15% of soils are in satisfactory, impaired, and unsatisfactory condition, respectively.

There is one interior pasture fence on the allotment that roughly divides it into a north and south half. This fence was just completed in 2006. Prior to this interior fence, livestock distribution was controlled by limiting access to water. Waterlot fencing is present around all 5 existing stock tanks. The grazing management for stage 1 in the approved AMP is fully implemented since all tanks are fenced. The permittee also uses herding and salting to control distribution and utilization patterns. The grazing system employed will be a deferred rotation among grazing units defined by water sources. In a non-drought year, utilization levels are usually acceptable in key areas. Walnut Creek is accessible to cattle, although stage 2 of the AMP would have the creek excluded by fencing if monitoring showed unacceptable use levels. Monitoring is regularly conducted on key reaches of this stream when livestock are on the allotment. Since the AMP was approved in 1999 utilization levels have been acceptable along Walnut Creek. It is a seasonal stream, with some riparian vegetation present, mainly consisting of deergrass.

Utilization measurements will be conducted in key livestock grazing areas and on key forage plants. Selection process for key forage plants and key grazing areas are defined in the Forest Service Region Three Rangeland Analysis and Management Guide dated June, 1997 and the 1996 Interagency Technical References.

Radium

The Radium Allotment on the Globe Ranger District encompasses 21,017 acres (Map 22) with a maximum permitted number of 5,686 AUMs. The allotment was not stocked in 2002 and 2003. Totals of 40%, 44%, and 16% of soils are in satisfactory, impaired, and unsatisfactory condition, respectively. Range condition is very good with 85% in good to fair range condition with 50% in an upward and 42%

in a stable trend. (data from 1965). An Environmental Assessment prepared in 1998 indicated that between 1964 and 1996 approximately half of the transects showed that the presence of desirable species (grasses and shrubs) had remained constant and half showed a marked decrease in desirable species. The majority of the allotment is desert grassland, but pinyon-juniper and chaparral habitat is also present. The allotment is in the Pinal Creek 5th code watershed. The Radium Allotment ranges in elevation from 3,200 to 6,400 ft.

The 16 pastures are grazed under a rest-rotation system of management where each pasture receives one year's growing season rest during a three year grazing cycle.

Ranger Station

The Ranger Station Allotment on Globe Ranger District covers 3,849 acres (Map 23) with a maximum permitted number of 824 AUMs. The allotment was not stocked in 2003 and 2004. Totals of 61%, 28%, and 11% of soils are in satisfactory, impaired, and unsatisfactory condition respectively. A total of 98% of the allotment is in poor range condition with 59% in a stable and 39% in a downward trend as indicated in a 1962 analysis. Parker Three-Step clusters and Pace Transects were read in January 2003. The following numbers are a breakdown of the three clusters that were read; rock - 33%, litter – 30%, bare ground – 35%, and hits – 2%. The following numbers are a breakdown of the two pace transects that were read; rock – 15%, litter – 63%, bare ground – 22%. Thus, on this portion of the allotment, minimal herbaceous vegetation was present. The allotment ranges in elevation from 3,800 to 7,800 feet. The allotment consists of grassland, pinyon-juniper, and chaparral habitat. It is within the Pinal Creek 5th code watershed.

The allotment consists of three winter pastures and one summer pasture. The winter pastures are grazed under a modified deferred system of management, where each of the pastures is grazed annually, however season of use differs each year. Each of the three winter pastures will receive growing season deferment one year during a three year grazing cycle.

Schoolhouse

The Schoolhouse Allotment encompasses 8,357 acres (Map 24) with a maximum permitted number of 2,749 AUMs. The allotment is bordered to the east and south by the Bar V Bar Allotment, to the west by the Roosevelt Allotment, and to the north by Roosevelt Lake. The elevation ranges from 5,268 feet at Pinyon Mountain to 2,100 feet at Roosevelt Lake. The vegetation is dominated by Sonoran Desert scrub. At higher elevations semi-desert grasslands occur along with some chaparral occurring on steep slopes. The dominant soils are deep sandy loams but large areas of moderately deep and shallow sandy loams occur mixed with rock outcrop. Totals of 34%, 23%, and 43% of soils are in satisfactory, impaired, and unsatisfactory condition respectively. The Schoolhouse Allotment utilizes a modified Santa-Rita grazing system. This system utilizes one herd in a 12-pasture rest-rotation grazing system. The lower country is managed in 9 pastures, with short duration grazing treatments of about 1 month. The upper country is divided into 3 pastures. These pastures (Honey Butte, Cottonwood, and Pinyon) are grazed for approximately 2 months each. The timing of grazing is rotated throughout the year; with each pasture being grazed at different times each rotation. There are four holding pastures on the allotment, Highway, Bull, steer, and Horse. These are utilized as needed at different times and for varying lengths each year.

Sedow

The Sedow Allotment on the Globe Ranger District is downstream on the Salt River from Haystack Butte and covers 40,723 acres (Map 25) with a maximum permitted number of 9,269 AUMs. No cattle

were stocked in 2003. Long-term upland trends on this allotment are upward, though short-term trends may be down somewhat due to recent drought conditions. Overall, the allotment is in improved condition due to the incorporation of a rest-rotation grazing system over the last 15 years or more and reduced stocking level since last analysis. The permittee on the Sedow Allotment is progressive and has supported riparian exclosures and fences in 7-Mile Wash, Rock Springs, and Hess Canyon.

Elevation on the allotment ranges from 2,500 feet along the Salt River to 6,300 feet at Timber Camp Mountain. Vegetation varies from Sonoran desertscrub to pinyon/juniper at higher elevations.

Topography prevents the Salt River from being used as part of this allotment. The allotment contains 5.5 miles of Salt River that is functional at risk. The term grazing permit for the Sedow Allotment is to graze adult cattle from January 1 through December 31, and yearling cattle for the established use period of January 1 through May 31 annually. There are 12 pastures not including the 11,000 acre 4Y Pasture. There are soon to be two more pastures when Storm Canyon is divided. This will allow at least one full year's rest per pasture each calendar year.

The 12 pastures are grazed under a rest-rotation system of management where each pasture receives one years rest during a four year grazing cycle.

Seven K

The Seven K Allotment covers 17,524 acres on the Tonto Basin Ranger District and is adjacent to the Tonto Basin Allotment on the north and east sides, the Three Bar wildlife area on the south and the Sunflower Allotment of the Mesa Ranger District on the west (Map 26). The maximum permitted number on the allotment is 2,800 AUMs. The allotment has not been stocked from 2003 through 2006. No soil condition data is available for the Seven K Allotment. The most recent range condition data was collected in 1974 in which a total of 29% and 71% of the rangelands were in fair and poor to very poor range condition, respectively. The Lone Fire burned 75% of the allotment in 1996. In 2005, the Three Fire burned the majority of the Mountain Pasture and small portions of the Ash Creek and Buck Basin Pastures. The Edge Fire of 2005 burned all of the Red Hill Pasture, one third of the Buck Basin Pasture, and the northern half of the Ash Creek Pasture.

The elevation varies from 6,099 feet at the Mazatzal Divide on the western side of the allotment to 2,158 feet at Roosevelt Lake in the eastern section of the allotment. Vegetation consists of mostly desert scrub and desert grassland species. Chaparral is very common on the steeper slopes. Ponderosa pine can also be found in higher elevations. Topography consists of rolling mountains at the lower elevations getting very steep and rough with the rise in elevation. There are three main drainages located on the allotment. These are Ash Creek, Bumblebee Creek and Sycamore Creek, all of which drain into Tonto Creek directly downstream of the allotment. Soils are shallow and mostly a sandy loam with some heavy clays on the tops of ridges. The Seven K Allotment is primarily within the Tonto Creek – Theodore Roosevelt Lake 5th Code watershed. With the northern end of the allotment in the Gun Creek- Tonto Creek 5th code watershed.

The Seven K grazing management is a rest-deferred rotation grazing system. Five pastures are included in the rotation system (excluding one holding pasture). Periods of rest vary, but generally the higher elevation pastures will receive between 6 and 12 months rest between use and lower elevation pastures will receive between 8 and 14 months rest between uses. The Highway Pasture will be used only as a yearling weaning pasture by a portion of the herd. This holding pasture will be grazed for varying amounts of time each year, but not longer than is prescribed in the grazing system. Grazing treatments will change throughout the year and by season.

Sunflower

The Sunflower Allotment on the Mesa Ranger District is a very large allotment with 155,534 acres (Map 27). Because of the diversity of terrain the allotment was divided into four units: Cottonwood, Desert, Cline, and Dos S Units. The allotment has not been stocked since 2000. The maximum permitted numbers for the allotment are 8,826 AUMs. This number is based on the entire allotment being used for grazing. At this time, only the Desert and Cline Units may be used (see below) so stocking levels when restocking occurs will be much lower than the maximum number since these units constitute only 18% of the allotment. This consultation will cover the Desert and Cline Units which covers 28,300 acres.

The Cottonwood Unit consists of 45,000 acres (30% of total area) with 90% of the Unit within the Four Peaks Wilderness. This Unit is bounded to the south by the Salt River, to the west by the Desert Unit, to the east by the District Boundary (3 Bar Wildlife Area), and to the north by the Cline Unit. This Unit has not been stocked since 2002. In a 2000 decision this Unit was not to be stocked for the 10-year term of the permit. Prior to any stocking the existing BA will be re-evaluated and, if needed, consultation will be initiated.

The Dos S Unit consists of 80,000 acres (51% of the total allotment). With the exception of the Pine Creek Pasture north of Cline Unit the remainder of the Unit is west of Highway 87 bounded to the west by the Bartlett Allotment and to the north by the Diamond Allotment. Sycamore Creek drainage runs from south to north. This section unit is being heavily impacted by recreational use along Sycamore Creek and environmental planning is currently being conducted to resolve this issue. No grazing will occur until this analysis is complete. Prior to any grazing a BA will be prepared and, if needed, consultation initiated for this Unit that will take into consideration both range and recreational use.

The Desert Unit consists of 19,300 acres and consists of a single pasture. This Unit is bounded on the south by the Salt River (Saguaro Lake), to the west by Highway 87, to the east by the Cottonwood Unit and north by the Cline Unit. Soils are 12% satisfactory, 62% impaired, and 26% unsatisfactory. In 1992, the ecological condition of the Desert Unit was poor with a static trend. There is no riparian habitat in the Desert Unit. The Desert Unit is utilized only during the winter/spring period.

The Cline Unit consists of 9,000 acres. This unit is bounded on the south by the Desert and Cottonwood Units, west by Brushy Basin, east by District boundary, and north by the Pine Creek Pasture of the Dos S Unit. Soils condition is 24% satisfactory, 73% impaired, and 4% unsatisfactory. In 1999 when soil condition data were collected, the area had not recovered from the Lone Fire and, as a result, many soils were rated as impaired due to excessive erosion. Portions of the allotment were also burned in the Three and Edge Fires. It is probable that a significant portion of the impaired soils have improved because of re-establishment of vegetation since the fires. No range condition or trend data is available for this allotment. Most of the Cline Unit is typed as interior chaparral (73%), pinyon-juniper (22%) and ponderosa pine/pinyon juniper (5%).

When the Cline Unit is restocked, it will be managed in a two-pasture flip flop. The pastures include Picadilla Creek (west side) and Brushy Basin (east side) Pastures. Each pasture will be used for six months and rested for six months. The Picadilla Creek Pasture will be used from October 1 to March 30 of each year and the Brushy Basin Pasture will be used April 1 to September 30 of each year.

Superior

The Superior Allotment on Globe Ranger District covers 58,303 acres (Map 28) with a maximum permitted number of 6,436 AUMs. The Superior Allotment was rested for approximately two years

between 2000 and 2002. Totals of 51%, 33%, and 15% of soils are in satisfactory, impaired, and unsatisfactory condition, respectively. No recent data is available for allotment condition or trend, though in 1961 totals of 46% and 54% were in fair and poor range condition. In 1979, uplands indicated an upward trend. A site visit in December 2004 showed signs of improved vegetation condition and vigor. Elevations on the allotment range from 2,400 to 5,200 feet. The dominant habitat type is semi-desert grassland and desert shrub. The seven pastures are grazed under a rest-rotation system of management where each pasture receives one years rest during a three year grazing cycle. Arnett Pasture is now excluded from grazing.

Tonto Basin

Tonto Basin is a large allotment consisting of 118,554 acres (Map 29) with a maximum permitted number of 4,014 AUMs. The majority of this allotment is on the Tonto Basin Ranger District with a portion within the Pleasant Valley Ranger District. It is bordered to the northeast by the Soldier Camp Allotment on the Pleasant Valley Ranger District, to the east by the Boneyback, Greenback and Dutchwoman Allotments, to the south by Roosevelt Lake and the Seven K Allotment, to the west by the Sunflower Allotment on the Mesa Ranger District, and to the north by the H4, Del Shay and 76 Allotments. Permitted numbers were reduced by 50% in 2001 to 7,827 HMs. All livestock were removed for the drought in 2002 and 2003. Soil conditions are rated 46% satisfactory, 20% impaired, and 25% unsatisfactory. The allotment was visited in 2004 and 2005 for range inspections and pre-grazing assessments. During these visits, it was noted that perennial coverage was sporadic in the Kayler and Mesquite Flat Pastures and moderate in the Lambing and Sycamore Pastures. Annual coverage was moderate to high throughout. Reports indicated that there was no evidence of recent erosion.

The elevation ranges from 7,100 feet in the Mazatzals to 2,100 feet at Roosevelt Lake. The vegetation is dominated by Sonoran Desert scrub at lower elevations grading to semi-desert grasslands at mid elevations. Pinyon/juniper woodlands dominate higher elevations with chaparral occurring mostly on steeper slopes. Ponderosa pine forests occur at the highest elevations. The main drainages on the allotment are Reno Creek, Park Creek, Oak Creek, Greenback Creek and Tonto Creek. There is a large riparian community along Tonto Creek which runs through the middle of the allotment; however it is not accessible to cattle. Most of the Tonto Creek Allotment is within the Gun Creek – Tonto Creek 5th code watershed. The southern end of the allotment is in the Tonto Creek – Roosevelt Lake 5th code watershed, and the northeastern corner of the allotment is in the Spring Creek 5th code watershed. In 2005 the western portion of the allotment in the Mazatzals burned in the Edge Fire, this included all of the Sycamore and Mesquite Pastures along with the southern half of the Mount Ord Pasture.

There are 10 pasture units grazed under a rest/deferred grazing system with three separate term grazing permits. Those permits are as follows: George T. Cline Equity Trust, Dorothy Cline Wells Trust, John Stephen Cline. The grazing strategy to be implemented by the Dorothy Cline Wells Trust and John Stephen Cline consists of 4 units, with thirteen pastures. The Pagewire Unit will have 3 pastures; each grazed for 6 months and rested for 6, 12, or 18 months. The length of rest varies for each pasture each year. The Quartz Ledge Unit contains 3 pastures. The Edwards Park Unit consists of 3 pastures that will be grazed for 6 months, with 12 months of rest. This system is designed to improve the amount of annual growing season rest.

The grazing strategy to be implemented by the George T. Cline Equity Trust consists of 3 units, with ten pastures and two holding pastures. These three units will be grazed with one herd of cattle each. The Mountain Unit will have 3 pastures, plus a holding pasture. Each pasture will be grazed every year for 2 to 4 months with 7 to 9 months of rest. The Middle Unit will have four pastures. Grazing periods are for

2 to 4 months, and rest periods vary from 5 to 12 months. The Lake Unit consists of three pastures, plus a holding pasture. Pastures will be grazed for 2 to 4 months, with rest periods of 3 to 9 months. Grazing treatments will change through the year and by season. The technical advantage of this system is the improved amount of annual growing season rest.

Vosburg

Vosburg Allotment on the Pleasant Valley Ranger District contains 1,700 acres (Map 30) with a maximum permitted number of 456 AUMs. The allotment was not stocked in 2002 and 2003. A 1993 Rangeland Trend Survey revealed that 25% of range vegetation rates in fair condition, with the remaining 75% in poor to very poor condition. The poor rating is due to a lack of grass species diversity. Watershed conditions rated as fair or good over 75% of the allotment, with 25% rated in poor condition. The sod-forming grass species, curly mesquite, is very common in pasture key areas. This species provides good groundcover and protection of soils, but rangelands dominated by this species are an indication of past management practices that have caused more desirable grasses to be eliminated from the system, or present only in protected areas. The observed trends for vegetation are 63% in an upward trend and 37% in a downward trend, with watershed trend being 63% upward, 12% stable, and 25% downward. Terrestrial Ecosystem Survey data shows that 43%, 35%, and 22% of soils are in satisfactory, impaired, and unsatisfactory condition, respectively.

There are 2 pastures on this allotment (Large and House). The House pasture is a small pasture mainly used in fall or spring for gathering, sorting, and shipping. The Large pasture supports the herd for most of the year, with distribution controlled by limiting access to water, and by herding and salting. Water sources in the Large Pasture consist of 2 trick tanks with troughs, 2 dirt stock tanks, and a waterlot on Cherry Creek. Of the existing water sources, one trick tank trough and one upland stock tank are fenced (Tunnel Tank). For the approved AMP to be completely implemented, all water sources will have fenced access, and grazing will be deferred through the 5 different units defined by the water source. Currently, salting and herding are the main means to control distribution. In non-drought years, utilization has generally been acceptable in all upland key areas with only partial implementation of the AMP. The current AMP was approved on 10/26/1994. Utilization levels shown in this proposal are less than those in the AMP.

The only portion of Cherry Creek that cattle can access is at the waterlot, approximately 200’ in length. Crouch Creek is fenced from livestock over most of its length, minus the approximately 100’ length that encompasses the FDR 54 crossing of Crouch Creek.

Walnut

The Walnut Allotment covers 11,776 acres on the Tonto Basin Ranger District and is bordered on all sides by the Tonto Basin Allotment (Map 31). The maximum permitted numbers for this allotment are 2,800 AUMs. The allotment was last stocked in 2002. The soil condition is 27% satisfactory, 31% impaired, and 42% unsatisfactory. No data on range condition or trend is available for this allotment.

The elevation ranges from 4,600 feet on the eastern side of the allotment to 2,300 feet near Tonto Creek. The vegetation is dominated by Sonoran Desert scrub throughout most of the allotment. Semi-desert grasslands and open juniper woodlands occur at higher elevations. The allotment is entirely within the Gun Creek- Tonto Creek fifth code watershed. The main drainages on the allotment are Lambing Creek and Walnut Creek, both of which flow into Tonto Creek.

The 5 pastures are grazed under a rest-deferred grazing system. The management system is derived from the basic concept of spring-summer rest two years out of three. This system provides spring-summer rest back to back two years out of four. However, it provides for summer growing season rest three years out of four and also provides spring growing season rest three years out of four. This system is intended to improve the amount of annual growing season rest.

Winters

The Winters Allotment on the Globe Ranger District encompasses 16,021 acres (Map 32) with a maximum permitted number of 3,677 AUMs. Totals of 63%, 22%, and 15% of soils are in satisfactory, impaired, and unsatisfactory condition, respectively. Range condition as measured in 1980 was 65% good or fair with 29% in an upward and 62% stable trend. Major habitat types are semi-desert grasslands, chaparral, and woodland. Elevation on this allotment ranges from 4,000 to 6,900 feet.

The 11 pastures are grazed under a rest-rotation system of management where each pasture receives spring/summer rest, back-to-back, two years out of three.

Species Considered and Evaluated

Only species listed on USFWS threatened and endangered species lists for Gila, Maricopa, Pinal, and Yavapai Counties were considered for analysis (http://www.fws.gov/arizonaes/Threatened.htm#CountyList). Potentially affected species were identified by evaluating the location and nature of the proposed actions and review of existing information on occurrances of federally listed species including USFS records and the AGFD (AGFD) State Heritage Program database for rare species. Designated critical habitat was also considered in the analysis.

The following (Table 1) is the list of TES species identified for the TNF, and their possible occurrence in the project area. Arizona agave, Arizona cliffrose, Yuma clapper rail, bonytail chub, Colorado pikeminnow, woundfin, Gila trout, and Mexican gray wolf were eliminated from further analysis due to their low likelihood of occurrence based on lack of known occurrences and/or suitable habitat.

Table 1. Threatened and Endangered Species for the Tonto National Forest and their Probable Occurance in or near the Project Area.

Common Name	Species	Status	Possible Occurence in Project Area
Arizona Hedgehog Cactus	*Echinocereus triglochidiatus var. arizonicus*	E	Y
Arizona Cliffrose	*Purshia subintegra*	E	N
Bald Eagle	*Haliaetus leucocephalus*	T, WC	Y
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	E, WC	Y, CH
Mexican Spotted Owl	*Strix occidentalis lucida*	T, WC	Y
Yuma Clapper Rail	*Rallus longirostris yumanensis*	E, WC	N
Bonytail Chub	*Gila elegans*	E, WC	N

Common Name	Species	Status	Possible Occurence in Project Area
Desert Pupfish	*Cyprinodon macularius macularius*	E, WC	N
Colorado Pikeminnow (squawfish)	*Ptychocheilus lucius*	E, WC	N
Loach minnow	*Tiaroga cobitis*	T, WC	Y
Spikedace	*Meda fulgida*	T, WC	Y
Woundfin	*Plagopterus argentissimus*	E, WC	N
Razorback Sucker	*Xyrauchen texanus*	E, WC	Y
Gila Topminnow	*Poeciliposis occidentalis occidentalis*	E, WC	Y
Gila Trout	*Oncorhynchus gilae gilae*	E, WC	N
Gila Chub	*Gila intermedia*	E, WC	Y, CH
Chiricahua Leopard Frog	*Rana chiricahuensis*	T, WC	Y
Lesser Long-nosed Bat	*Leptonycteris curasoae yerbabuenae*	E, WC	Y
Mexican Gray Wolf	*Canis lupis baileyi*	E, WC	N

Key:

E = Federally Listed as Endangered, under Endangered Species Act (ESA)
T = Federally Listed as Threatened, under ESA
WC = Wildlife of Special Concern in Arizona (AGFD Draft 3/16/96)
Y = Known/possible occurrence in the project area
N = Not known or thought to occur in the project area
CH = Critical Habitat in project area
PCH = Proposed Critical Habitat in project area

Effects of the Proposed Action on Each Species Evaluated

Each species listed in Table 1 was evaluated further in this document due to the fact that it is possible that they occur in the project area. Determinations are summarized by species for each allotment in Table 2. Analysis is presented by species following this summary table.

Table 2. Determinations of Effect Summary by Allotment by Species[12]

Allotment	BAEA	MSO	MSO CH	CLF	SWWF	SWWF CH	LLNB	GTM	GCH	GCH CH	SD	LM	RBS	RBS CH	AHHC
Armer Mountain	NE	NLAA	NLAA	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Bar T Bar	NE	NLAA	NLAA	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Bar X/ Haigler Creek/ Young	NE	NLAA	NLAA	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Capitan	NE	NLAA	NLAA	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NLAA
Center Mountain	NLAA	NLAA	NLAA	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Coolidge Parker	NE	NLAA	NLAA	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NLAA
Crouch Mesa	NE	NE	N/A	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Del Shay	NLAA	NE	N/A	NE	NLAA	NLAA	NE	NLAA	NE	N/A	NE	NE	NE	N/A	NE
Devils Canyon	NE	NE	N/A	NE	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NLAA
Diamond	NE	NLAA	NLAA	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
H4	NE	NLAA	NLAA	NE	NLAA	NLAA	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Hardscrabble	NE	NE	NLAA	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Hardt Creek	NLAA	NE	N/A	NE	NLAA	NLAA	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Haystack Butte	NLAA	NE	N/A	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NLAA	NLAA	NE
Jones	NE	NLAA	NLAA	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Lyons Fork	NE	NLAA	NLAA	NE	NE	NE	NE	NE	NLAA	NLAA	NE	NE	NE	N/A	NLAA
OW	NLAA	NLAA	NLAA	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Poison Springs/ Sierra Ancha	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NE	NE	NE	N/A	NE	NE	NLAA	NLAA	NE
Potato Butte	NE	NE	N/A	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Radium	NE	NE	N/A	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NLAA

Allotment	BAEA	MSO	MSO CH	CLF	SWWF	SWWF CH	LLNB	GTM	GCH	GCH CH	SD	LM	RBS	RBS CH	AHHC
Ranger Station	NE	NLAA	NLAA	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NLAA
Schoolhouse	NE	NE	N/A	NE	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Sedow	NLAA	NE	N/A	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NLAA	NLAA	NLAA
Seven K	NLAA	NLAA	NLAA	NE	NLAA	NLAA	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Sunflower	NE	NE	NLAA	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Superior	NE	NE	N/A	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NLAA
Tonto Basin	NLAA	NLAA	NLAA	NLAA	NLAA	NLAA	NE	NLAA	NE	N/A	NE	NE	NE	N/A	NE
Vosburg	NE	NE	N/A	NLAA	NLAA	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Walnut	NLAA	NE	N/A	NE	NLAA	NLAA	NE	NE	NE	N/A	NE	NE	NE	N/A	NE
Winters	NE	NE	N/A	NE	NE	NE	NE	NE	NE	N/A	NE	NE	NE	N/A	NLAA

[1]MSO – Mexican spotted owl; MSO CH – Mexican spotted owl Critical Habitat; SWWF – southwestern willow flycatcher; CLF – Chiricahua leopard frog; AHHC – Arizona hedgehog cactus; GTM – Gila topminnow; GCH – Gila chub; GC C.H. – Gila chub critical habitat; SD – spikedace; LM – loachminnow; LLNB – lesser long-nosed bat; RBS – razorback sucker; RBS C.H. – razorback sucker critical habitat.

[2]NLAA – May Affect, Not Likely to Adversely Affect; NE – No Effect; N/A – Not Applicable.

General Effects of Livestock Grazing on Watersheds

Watershed condition has been a historic and continuing concern over most of the Tonto National Forest. The Forest was originally established for the purpose of watershed protection. The accounts of overgrazing at the turn of the century are well known throughout the Southwest. Hanes (1996) cites Luna Leopold in his book, *A View of the River* (1994) stating that the late 1800's are viewed by geomorphologists as a period of "arroyo cutting" throughout the west. The cause is generally attributed to climatic events (drought followed by rain events) and overgrazing (Hanes 1996). Many of the watersheds on the Tonto have been altered by past use to the point that it is unlikely that they will fully recover to pre-settlement conditions in the foreseeable future. The grazing proposed in this document will be at conservative use levels which provides for residual vegetation at all times. This should minimize effects to the watershed associated with grazing. Additionally, stocking levels on the TNF are much lower than the levels that have caused watershed damage in the past. The Tonto NF has instituted a drought policy which reduces stocking during droughts. Most of the allotments were totally de-stocked while others had reduced numbers during the most recent drought. This has provided protection for many of the watersheds. Cattle are only recently being re-stocked on many of the allotments. Given the proposed level of conservative stocking, it is unlikely that the grazing effects on existing watershed condition can be meaningfully measured or detected, much less isolated from those cumulative effects resulting from historic or recent grazing. Thus we feel these effects are insignificant or discountable.

Bald Eagle (*Haliaeetus leucocephalus*)

Background

The bald eagle south of the 40th parallel was listed as endangered under the Endangered Species Act of 1966 on March 11, 1967. It was reclassified to threatened status on July 12, 1995, and proposed for delisting on July 6, 1999. No critical habitat has been designated for this species. A Conservation Assessment and Strategy was drafted in 2000.

Breeding bald eagles in Arizona stay in their nesting area year-round (New Mexico is unknown), while juvenile eagles migrate north (Pacific northwest, northern California, Greater Yellowstone area, and Canada). Juvenile eagles return to Arizona in the fall and along with wintering migrants wander throughout the state during the winter and into early spring (Hunt et al., 1992). During the first 3-4 months of the year, winter migrants, Arizona breeding/incubating eagles, itinerant Arizona adult eagles, and Arizona juvenile/immature eagles all exist within the state.

Large lakes, reservoirs and rivers in the southwest provide the nesting habitat. Large diameter trees for nesting and roosting are also a necessary habitat component. Roosting can occur almost anywhere where large trees and prey base or carrion opportunities exist.

Eagles in Arizona primarily nest and forage in the central part of the state in the Sonoran Desert along the Salt, Verde, Gila, Agua Fria, and Bill Williams drainages and along Tonto, Tangle, Cibecue, and Canyon creeks. Eagles use a variety of aquatic systems consisting of free-flowing rivers, regulated rivers (below dams), and impoundments. Eagles build their nests on cliff ledges, pinnacles, and in live cottonwood, willow, sycamore, juniper, and pinyon trees or snags.

The goals of the Southwest Recovery Plan were met in the first three years of its drafting (Arizona Bald Eagle Q&A Sheet by Game and Fish Department, Southwest Bald Eagle Management Committee website: www.swbemc.org). The population trend in Arizona is up, which coincides with the national

trend (AGFD Heritage Data Management System). The success of the recovery program was based primarily on seasonal closures and the Arizona Bald Eagle Nestwatch Program that enforced the closures eliminating human disturbance to the breeding cycle. This, in conjunction with the oversight provided by the Southwest Bald Eagle Management Committee and monitoring and demographic studies, has led to the recovery of the bald eagle in the southwest. As of 2006, 50 breeding territories were active in Arizona. Additional historic nest sites are known, but have not been active in recent history. Based on information presented in AZ Game and Fish (2005), at least 20 nesting territories occur on the TNF, almost 50% of the statewide population. The population is on a stable to upward trend. Detailed information on the TNF bald eagle population can be found in USFS (2005b) on file at the TNF Supervisor's Office.

Bald eagles do face several threats on the TNF. During the last 10 years along the upper Salt River above Roosevelt Lake, bald eagle productivity has nearly ceased due to the introduction of non-native fish which has led to the eradication of native suckers. Concentrations of heavy metals in bald eagle eggs are a concern in Arizona. Mercury is present at levels sufficiently high to cause egg failure along the Verde and Salt Rivers. Documented direct threats include low-level aircraft, collisions with transmission lines, poisoning, and other human disturbances (USFWS, 2005a). Shooting of eagles persists. Rivers and riparian habitat are threatened by development, groundwater extraction, surface water diversion, dam management, bank stabilization, and other land use practices. Fishing line has been detected and removed from nests in 19 different breeding areas consisting of 62 separate instances; two instances resulted in mortality (USFS, 2004a).

Status In Action Area

Bald eagle breeding areas along or associated with drainages possibly affected by the proposed grazing action involve breeding eagles on Tonto Creek (Seventy Six, Sheep, and Tonto breeding areas), and Salt River (Cibecue, Canyon, Redmond, Pinal, and Pinto breeding areas). All allotments and drainages can have migrating and wintering eagles.

The AGFD conducts breeding season monitoring on bald eagle nests on the TNF. The most recent data that has been provided to the TNF by AGFD was through the breeding season of 2006. Productivity of these breeding areas can be found in Appendix 2.

Grazing allotments associated with breeding areas are listed in Table 3.

Table 3. Bald Eagle Breeding Areas and Associated Grazing Allotments

Allotment Name	Land Ownership	Breeding Areas	Protection
OW (located upstream on Canyon Creek, a tributary to the Salt River)	Pleasant Valley RD,	Associated w/ Canyon (nest site on Canyon Creek within Reservation)	No information available for reservation. Riparian excluded from grazing on OW.
Haystack Butte	Globe RD	Associated w/ Redmond	River excluded
Sedow	Globe RD	Associated w/ Redmond	River excluded

Allotment Name	Land Ownership	Breeding Areas	Protection
Poison Springs/Sierra Ancha	Tonto Basin RD	Pinto & Pinal	River and Pinto Creek BA Excluded from grazing.
Hardt Creek	Tonto Basin RD	76	Eagle Pasture excluded from grazing year round.
Del Shay	Tonto Basin RD	Associated w/ Sheep	
Walnut	Tonto Basin RD	Sheep	Tonto Creek excluded
Tonto Basin	Tonto Basin RD	Sheep & Tonto	Tonto Creek excluded
Seven K	Tonto Basin RD	Associated w/ Tonto	Tonto Creek excluded

Effects Analysis

The Framework lists criteria for "no effect" and "may affect, not likely to adversely affect" determinations. In cases where neither of the above criteria are met, a "may affect, likely to adversely affect" determination may be warranted. The Framework outlines that one of the following criteria must be met for making "no effect" determinations for bald eagles:

1. Bald eagles are not present within the action area.
2. Livestock grazing will not occur, in areas that drain into identified bald eagle nesting habitat (upper Verde and Salt rivers and Tonto Creek in Arizona) or roost sites.
3. Livestock management activities (beyond presence of livestock) in the action area will not occur within 0.25 miles of a bald eagle roost or nest site during any time of occupation by bald eagles.

In order to make a "may affect, not likely to adversely effect" determination, the Framework requires that each of the following criteria be met:

1. Within the action area, livestock management activities (beyond presence of livestock) that occur within 0.25 mi of a bald eagle nest (January-June) or roost site will not occur during the season of bald eagle occupation (nesting or wintering),
2. Indirect effects occurring within the action area resulting from upland livestock grazing are determined to be insignificant or discountable.

With the exception of possible transient or winter records, bald eagles are not known to occur within the Armer Mountain, Bar T Bar, Bar X/Haigler Creek/Young, Capitan, Center Mountain, Coolidge Parker, Cross F, Crouch Mesa, Del Shay, Devils Canyon, Diamond, H4, Hardscrabble, Jones, Lyons Fork, Potato Butte, Radium, Ranger Station, Schoolhouse, Sunflower, Superior, Vosburg, or Winters Allotments, thus no direct or indirect effects are anticipated.

Breeding areas are located on the Poison Springs/Sierra Ancha (Map 20), Hardt Creek (Map 15), Tonto Basin (Map 29), and Walnut (Map 31) Allotments. The Haystack Butte, Sedow, OW, Del Shay, and Seven K are associated with breeding areas. Other unsubstantiated records exist in the HDMS database;

extensive searches by AGFD have not found nests. Productivity of these breeding areas is similar to that of other breeding areas on the Tonto NF with the exception of the Seventy-six breeding area which has not fledged young since 2001. The failures associated with this breeding area are due to limited food availability and a double mate replacement (J. Driscoll, pers. comm.). The Canyon breeding area has not been occupied since 2000.

Direct effects are not anticipated for any of the allotments containing breeding areas since grazing and associated activities will not occur within 0.25 miles of nesting areas during the breeding season (January – June). The majority of threats to bald eagles on the Tonto as listed above include introduction of non-native fishes, mercury contamination, and human disturbance. These threats are outside the scope of the livestock grazing. However, livestock grazing can have indirect effects through damage to riparian habitat either by preventing regeneration or denuding the uplands to such an extent that watersheds are in poor condition and there is an increase in severity of flood events which leads to riparian habitat destruction. The riparian habitat along Tonto Creek and the Salt River will be excluded from grazing on all thirteen allotments listed above, thus eliminating any direct effects of grazing on the breeding area and on riparian regeneration. Increasing the amount of riparian habitat (as a result of limited grazing) is expected to reduce the force of flood flows, reducing impacts to habitat in the Seventy Six, Sheep, and Tonto breeding areas along Tonto Creek; and Canyon, Redmond, Pinal, and Pinto breeding areas along the Salt River. Removing or limiting grazing within the stream is expected to improve conditions for fish, the main prey item for bald eagles. An increase in the amount of riparian habitat is expected in the future which will produce replacement perching, roosting, and foraging trees. For all riparian areas outside of the Salt River or Tonto Creek capable of supporting bald eagle habitat, these areas will be considered critical management areas (not to be confused with critical habitat as defined by ESA). Riparian areas will be grazed using guidance from USFS (2002) as mentioned previously. This should provide for improving conditions in the riparian area. Since current levels of use are much less than historic levels and grazing does not occur in the Salt River or Tonto Creek riparian areas, it is expected that the indirect effects of grazing to riparian areas in allotments within bald eagle habitat are insignificant or discountable.

Upland soil conditions vary in the vicinity of breeding areas. The adoption of conservative use (proposed action) should maintain or improve upland range and watershed conditions. For this reason, indirect effects of grazing in uplands are expected to be insignificant or discountable (see above section *General Effects of Livestock Grazing on Watersheds*). No cumulative effects are anticipated.

Determination Of Effect – Bald Eagle

No effect – Armer Mountain, Bar T Bar, Bar X/Haigler Creek/Young, Capitan, Coolidge Parker, Crouch Mesa, Devils Canyon, Diamond, H4, Hardscrabble, Jones, Lyons Fork, Potato Butte, Radium, Ranger Station, Schoolhouse, Sunflower, Superior, Vosburg, and Winters Allotments

May affect, not likely to adversely affect – Del Shay, Poison Springs/Sierra Ancha, Hardt Creek, Tonto Basin, Center Mountain, Haystack Butte, Sedow, OW, Seven K, and Walnut Allotments

Mexican Spotted Owl (*Strix occidentalis lucida*)

Background

The Mexican spotted owl was listed as a threatened species in 1993. The primary reasons for listing were the threat of even-aged timber harvest and threat of catastrophic wildfire. On August 31, 2004, critical habitat for the Mexican spotted owl was designated. The USFWS appointed the Mexican Spotted

Owl Recovery Team in 1993, which produced the Recovery Plan for the Mexican spotted owl in 1995 (USFWS, 1995a).

The Mexican spotted owl is distinguished from the California and northern subspecies chiefly by plumage and geographic distribution. The Mexican owl is mottled in appearance with irregular white and brown spots on its abdomen, back, and head. The spots are larger and more numerous than in the other two subspecies, giving it a lighter appearance. Unlike most owls, spotted owls have dark eyes. The Mexican subspecies has the largest geographic range of the three. It extends from the southern Rocky Mountains in Colorado and the Colorado Plateau in southern Utah, southward through Arizona and New Mexico, and discontinuously through the Sierra Madre Occidental and Oriental to the mountains at the southern end of the Mexican Plateau.

Owls breed sporadically and do not nest every year. This owl's reproductive chronology varies somewhat across its range. In Arizona, courtship apparently begins in March with pairs roosting together during the day and calling to each other at dusk (Ganey, 1988). Eggs are laid in late March or typically early April. Incubation begins shortly after the first egg is laid, and is performed entirely by the female (Ganey, 1988). The incubation period for the owl is assumed to be 30 days (Ganey, 1988). During incubation and the first half of the brooding period, the female leaves the nest only to defecate, regurgitate pellets, or receive prey from the male, who does all or most of the foraging (Forsman et al., 1984; Ganey, 1988). Eggs usually hatch in early May, with nestling owls fledging 4-5 weeks later, and then dispersing in mid-September to early October (Ganey, 1988).

The owl's range covers much of the southwestern U.S. and Mexico, but owls do not occur uniformly throughout this area. They occur in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep rocky canyonlands. Surveys have revealed that the species has an affinity for older well-structured forests in what is otherwise a diverse array of landscapes.

Spotted owls nest, roost, forage, and disperse in an array of biotic communities. Mixed conifer forests are commonly used throughout most of the range. In general, these forests are dominated by Douglas-fir and/or white fir, with codominant species including southwestern white pine, limber pine, and ponderosa pine. The understory often contains the above coniferous species as well as broadleaved species such as Gambel oak, maples, boxelder, and New Mexico locust. In southern Arizona and Mexico, Madrean pine-oak forests are also used commonly. These forests are typically dominated by an overstory of Chihuahua and Apache pines in conjunction with species such as Douglas-fir, ponderosa pine, and Arizona cypress. Evergreen oaks are typically prominent in the understory (USFWS, 1995a).

Habitat-use patterns vary throughout the range and with respect to owl activity (nesting, roosting, or foraging). In the northern part of the range, including southern Utah, southern Colorado, and far northern Arizona and New Mexico, owls occur primarily in steep-walled, rocky canyons. Along the Mogollon Rim in Arizona and New Mexico, habitat use is less restricted, and spotted owls occur in mixed-conifer forests, ponderosa pine-Gambel oak forests, rocky canyons, and associated riparian forests. South of the Mogollon Rim and into Mexico a still wider variety of habitat types are used, including mixed-conifer, Madrean pine-oak, and Arizona cypress forests, encinal oak woodlands, and associated riparian forests. Much of this regional variation in habitat use likely results from differences in regional patterns of habitat and prey availability (USFWS, 1995a).

The TNF encompasses the lower watersheds of the Salt and Verde Rivers and is split between two MSO recovery units; the Upper Gila Mountain Recovery Unit (41 Protected Activity Centers (PACs)) and the Basin and Range-West Recovery Unit (31 PACs). Most PACs are associated with the Mogollon Rim

and the Mazatzal, Sierra Ancha, and Pinal mountain ranges (USFWS, 2002a).

A detailed account of the taxonomy, biology, and reproductive characteristics of the spotted owl is found in the final rule listing it as a threatened species (USFWS, 1993) and in the Recovery Plan for the Mexican Spotted Owl (USFWS, 1995a).

Status In Action Area

The action area includes 39 PACs and four critical habitat blocks (BR-W-4, BR-W-5, BR-W-6, and UCM-10). Protected habitat either contains PACs, has mixed conifer or pine-oak habitat with >40% slope where timber has not been harvested for the past 20 years, or is an administratively determined reserved land (USFWS, 1995a). Restricted areas are those in mixed conifer and pine-oak habitat that are not protected (USFWS, 1995a). A list of PACs by allotment and mountain range is located in Table 4.

Data on spotted owl PACs has been collected by USFS personnel, USFS contractors, and AGFD. Available information on productivity of PACs within the action area can be found in Appendix 3.

Table 4. Protected Activities Centers (PACs) and Amount of Critical Habitat by Mountain Range and by Allotment.

Allotment Name	Mountain Range	PAC Name(s)	PAC Protection	Critical Habitat Present
Bar T Bar	Mazatzal	Deer Creek; Maple Draw; Pigeon Springs; Y Bar Basin	PACs excluded from grazing during breeding season, Grazing may occur part of year	Total of 20,046 acres
Diamond	Mazatzal	Mount Ord	PAC shared with H4 Allotment; No grazing due to steep slopes	A total of 12,823 acres in eastern 1/3 of allotment. Very little restricted habitat, steep mixed conifer near Mount Ord.
Sunflower	Mazatzal	None within allotment. Buck Basin and Four Peaks outside of allotment to the east.	No PACs	Approximately 9,000 acres in the Cline Unit with little or no restricted habitat.
H4	Mazatzal	Mount Ord (Majority of PAC)	PAC excluded from grazing during breeding season.	Total of 7,136 acres
Seven K	Mazatzal	Buck Basin	PAC excluded from grazing during breeding season.	5,585 Acres
Tonto Basin	Sierra Ancha/Mazatzal	Mt Ord (69 acres); 1/10 mile from Buck Basin; Bearhead Canyon; and Copper Mtn (37 acres).	PACs excluded from grazing during breeding season.	Total of 9,522 acres in Mazatzal Mountains and 19,292 acres in Sierra Ancha Mountains

Allotment Name	Mountain Range	PAC Name(s)	PAC Protection	Critical Habitat Present
Bar X, Haigler Creek, Young	Mogollon Rim	Colcord, Turkey Pk, NW Turkey Pk, Turkey Pk SW, Lost Salt, Parallel Cyn, Chamberlain, Colcord (outside of allotment).	Grazing with utilization limits, restrict disturbance during nesting season.	Bar X = 7,237 acres Haigler = 6,895 acres Young = 2,457 acres Total = 16,579 acres
OW	Mogollon Rim	Bear Sprgs, Reservation, Valentine-Lower, Rose, Canyon-Lower, and Lion.	Majority of PACs inaccessible to livestock due to steep slopes.	4,205 acres
Hardscrabble	Mogollon Rim	No PAC (nearest PAC, ¼ mile North)	NA	A total of 527 acres are designated but no restricted or protected within designated habitat.
Capitan	Pinal Mountains	Small SE corner of Pioneer Pass PAC, most of which is in the Coolidge Parker Allotment.	The edge of the PAC is located in the Maverick Pasture. The pasture is primarily chaparral and is not very accessible due to steep slopes.	A total of 6,666 acres are designated as part of BR-W-6 unit.
Coolidge Parker	Pinal Mountains	Ferndell Spring, Pioneer Pass,	Grazing limited to gentle slopes and drainage bottoms, restrict disturbance during nesting season. Areas around Pioneer Pass will be monitored closely to ensure residual cover is available.	A total of 9,534 acres designated.
Jones	Pinal Mountains	Madera Peak North, Frio Spring, Sulfide del Rey	Grazing limited to gentle slopes and drainage bottoms, restrict disturbance during nesting season	A total of 11,500 acres designated.
Lyons Fork	Pinal Mountains	Mill Creek	Grazing limited to gentle slopes and drainage bottoms, restrict disturbance during nesting season	A total of 14,355 acres designated.
Ranger Station	Pinal Mountains	Icehouse Canyon	Grazing limited to gentle slopes and drainage bottoms, restrict disturbance during nesting season	There is a total of 5,679 acres designated.
Armer Mountain	Sierra Ancha	None	N/A	A total of 19,285 acres designated.

Allotment Name	Mountain Range	PAC Name(s)	PAC Protection	Critical Habitat Present
Center Mountain	Sierra Ancha	Center Mtn, Devil's Chasm, Cold Water Cyn, Pueblo Cyn, & Cold Springs	Majority of PACs inaccessible to livestock due to steep slopes.	A total of 9,015 acres designated.
Poison Springs (No PACs)/ Sierra Ancha	Sierra Ancha	Coon Creek, Devil's Chasm, Cold Springs Cyn, Pueblo Cyn, Reynolds Creek, Center Mtn, & Cienega Springs	PAC excluded from grazing during breeding season.	P. Springs = 0 acres S. Ancha =13,332 acres

Effects Analysis

The Framework outlines that one of the following cirteria must be met for making "no effect" determinations for Mexican spotted owls:

1. Mexican spotted owls are not present within the action area.
2. In the action area, no livestock grazing or livestock management activities will occur within protected and restricted habitats, as defined by the species' recovery plan.

In order to make a "may affect, not likely to adversely affect" determination, the Framework requires that each of the following be met:

1. In the action area, livestock grazing or livestock management activities will occur within PACs, but no human disturbance or construction actions associated with the livestock grazing will occur in PACs during the breeding season (March 1 – July 31),
2. Livestock grazing and livestock management activities within PACs, in the action area, will be managed for levels that provide the woody and herbaceous vegetation necessary for cover for rodent prey species, the residual biomass that will support prescribed natural and ignited fires that would reduce the risk of catastrophic wildfire in the Forest, and regeneration of riparian trees,
3. In owl foraging areas, forage utilization will be maintained at conservative levels (see definitions),

Mexican spotted owls are not known to occur nor has critical habitat been designated within the Crouch Mesa, Del Shay, Devils Canyon, Hardt Creek, Haystack Butte, Potato Butte, Radium, Schoolhouse, Sedow, Superior, Vosburg, Walnut, or Winters Allotments, thus no direct, indirect effects, or cumulative effects are anticipated.

PACs and designated critical habitat are located within the Bar T Bar, Diamond, H4, Seven K, Tonto Basin, Bar X/Haigler Creek/Young, OW, Capitan, Coolidge Parker, Jones, Lyons Fork, Ranger Station, Center Mountain, and Poison Springs/Sierra Ancha Allotments. Critical habitat, but no known PACs occur within the Hardscrabble and Armer Mountain Allotments.

The Mexican Spotted Owl Recovery Plan (USFWS, 1995a) makes the following assertions on the impacts of livestock grazing:

1. Grazing may influence prey availability by reducing cover or changing the herbaceous structure to favor species that may not provide the needed prey.
2. Grazing may change the structure by reducing herbaceous ground cover which may lead to an increase in shrubs and small trees that can decrease the potential for beneficial low-intensity ground fires.
3. Excessive grazing in riparian areas can reduce or eliminate important shrub, tree, forb, and grass cover.
4. Excessive grazing sustained for long periods can inhibit or retard an area's ability to produce or mature into habitat suitable for the owl and its prey.

To mitigate the negative effects of grazing the recovery team recommended the following guidelines (USFWS, 1995a):

1. Monitor grazing use by livestock and wildlife in "key grazing areas".
2. Implement and enforce grazing utilization standards that would attain good to excellent range conditions.
3. Implement management strategies that will restore good conditions to degraded riparian communities.

The proposed action responds directly to the effects summarized above and the guidelines recommended by the recovery team. In some PACs grazing will not be allowed during the breeding season. In others grazing and interrelated and interdependent actions occur in PACs but no human disturbance or construction action associated with the grazing allotments occur in PACs during the breeding season. Livestock grazing in any pasture (including pastures with PACs) will not exceed conservative use over the long-term and USFS (2002) will be used to provide guidance for riparian use. During a pasture use period, the District Ranger will assess grazing use patterns across the pasture, grazing intensity in key and critical areas, and timing of the grazing period to determine if management action is necessary to protect spotted owls or their habitat.

The Tonto NF population of spotted owls is important regionally due to the fact that it provides a linkage between the populations in southeastern Arizona and those further north on the Colorado plateau. As such, effective management is essential in maintaining quality habitat and a sustainable population.

Mazatzal Mountain Range

Pigeon Springs, Deer Creek, Maple Draw, and Y Bar Basin PACs are totally within the Bar T Bar Allotment (Map 3). The Deer Creek PAC was occupied in 2002 and Pigeon Springs and Maple Draw in 2003. The Y Bar Basin PAC was occupied when last monitored in 1992. Actual acres of restricted and protected habitat are not known. All PACs were impacted in 2004 by the Willow fire. A BA and consultation is ongoing for fire suppression activities. None of the PACs will be utilized by cattle during the breeding season.

Diamond Allotment (Map 12) shares the Mount Ord PAC with H4 Allotment (Map 13). The Mount Ord PAC is in the north-eastern portion of the allotment. This PAC was occupied in 2002 when last monitored. The majority Mount Ord PAC occurs within the H4 Allotment. A total of 12,823 acres of critical habitat have been designated in the eastern 1/3 of the allotment. According to TES, there is very little protected or restricted habitat. Only 154 acres are typed as ponderosa pine with the remaining acreage containing lower elevation vegetation types, primarily Sonoran and semi desert grassland-mixed scrub. The Mount Ord prescribed burn project includes portions of the H4 and Diamond Allotments.

The prescribed burn surrounds the Mount Ord PAC and involves underburning the area for fuels reduction.

The USFWS concurred with the determination of "not likely to adversely affect" for the Sunflower Allotment (Cline Unit) twice, once in 2000 for both Cottonwood and Cline Units and again in 2002 for the Cline Unit as part of a BO (AESO/SE, 2-21-99-F-300; USFWS, 2002a). The allotment has not been stocked since 2002. If the allotment is stocked in the future the baseline or action will be the same as stated in the BO in 2002. There are no PACs within the allotment but there are 9,000 acres of designated critical habitat (BR-W-4) in the Cline Unit. The acres of restricted or protected habitat within the Cline Unit are unknown but are thought to be small since 95% of the allotment is interior chaparral or pinyon-juniper habitat. The area is recovering from the Lone Fire in 1996 and habitat conditions should be improving due to removal of livestock.

The USFWS concurred with the determination of "not likely to adversely affect" for the H4 Allotment as part of a BO (AESO/SE, 2-21-99-F-300) (USFWS, 2002a). Conditions have not changed for this allotment. The majority of Mount Ord PAC is located within the Brunson South Pasture of the H4 Allotment. This PAC will not be grazed during the breeding season. A total of 7,136 acres were designated as critical habitat within the Brunson South and Brunson North Pastures.

The Buck Basin PAC in the Mazatzal Mountains of the Seven K Allotment (Map 26) is approximately 502 acres. It is located in the highest portion (5,500 feet elevation) of the allotment, in the northwest corner of the Buck Basin Pasture. The PAC was occupied in 1993 but not in 1994 when last monitored. This PAC will not be grazed during the breeding season. The two pastures containing critical habitat are Buck Basin and Mountain Pastures. The Buck Basin PAC is located in the headwaters of Sycamore Creek. The Seven K has not been stocked since 2002. In 2005 the Edge Fire burned the northwest portion of the Buck Basin Pasture, right up to the edge of the Buck Basin PAC. A few acres of the PAC on the extreme northern portion were burned in the fire. Additionally the entire Mountain Pasture burned in the Three Fire of 2005.

Only 69 acres of the Mount Ord PAC occurs within the Mazatzal Mountains on the Tonto Basin Allotment (Map 29). A total of 9,522 acres of critical habitat was designated mostly within the Mount Ord Pasture. The summary and determination of effect for Tonto Basin will be discussed in more detail under the Sierra Ancha Mountain section below.

Of the allotments mentioned above, the Bar T Bar, Diamond, H4, Seven K, and Tonto Basin contain PACs. No grazing, human disturbance, or construction actions associated with grazing will occur in PACs during the breeding season for any of these allotments. For H4 no grazing will occur anywhere on the allotment June through August. Because of this, no direct effects due to disturbance are anticipated.

Grazing could indirectly impact the watersheds associated with the PACs listed above. Due to limitations in recent data, current range condition and trend data is not accurate, so baseline environmental conditions are not known. Though grazing may delay the recovery of degraded watershed conditions, under conservative use grazing, range and soil conditions should not degrade, but rather remain stable or improve over time. Additionally, grazing could reduce cover for spotted owl prey species. Since the PACs are considered critical areas, they will be monitored to ensure conservative use is not exceeded and that prey cover is maintained. Therefore, indirect effects resulting from upland livestock grazing to spotted owls are not likely to reach the level where take would occur, thus these indirect effects are insignificant or discountable to spotted owls. No cumulative effects are expected.

Mogollon Rim

The Bar X/Haigler Creek/Young Allotments are managed as one livestock operation and will be considered together (Map 4). There are 7,237, 6,885, and 2,457 acres of critical habitat for Bar X, Haigler Creek and Young Allotments, respectively. These allotments contain 7 PACs within the allotments and one near by: Colcord, Turkey Peak NE, Turkey Peak NW, Turkey Peak SW, Lost Salt, Parallel Canyon, Chamberlain, and Colcord Canyon (outside of allotment) PACs. The three Turkey Peak PACs are in the Turkey Peak Pasture which is currently not grazed. The Colcord and Lost Salt PACs are in the Lost Salt Pasture which is also not currently grazed. The extreme western edge of the Parallel Canyon PAC is in the Round Mountain Pasture. Data from the 1994-1995 production and utilization study indicated that use with permitted numbers is improving herbaceous plant densities, diversity, and vigor and that the majority of the range is in good condition and improving. Since only a small portion of one PAC is within a grazed pasture, and this pasture is grazed only in the fall/winter period, it is unlikely that the proposed action will impact the owl.

The OW Allotment contains 6 PACs: Bear Springs, Reservation, Valentine-Lower, Rose, Canyon Lower, and Lion (Map 19). There are 4,205 acres of critical habitat. The USFWS concurred with the determination of "not likely to adversely affect" for the OW Allotment as part of a BO (USFWS, 2002a), however, habitat conditions have greatly changed since that time due to the Rodeo-Chediski fire. All PACs were severely impacted by this fire in 2002. The mixed conifer type was burned at high intensities and very little of this type remains. Much of the ponderosa pine habitat type burned at high enough intensity to kill the trees. All PACs have been informally monitored and owls were found only in association with the Reservation PAC in 2003 and 2004. Prior to the fire, 75% of the range condition trend was upward and 25% stable. Increased opening of the forest due to the fire will increase the amount of acres in an upward trend. Grasses and forbs have responded well to the fire and should increase prey base available to spotted owls. The limiting factor for these PACs will likely be availability of mature forested habitat with sufficient stocking. All PACs are located on steeper slopes where grazing by livestock is excluded or very limited. For this reason, the action is not likely to impact the spotted owl.

There is no PAC within the Hardscrabble Allotment (Map 14). The nearest PAC is ¼ mile north in Deadman Mesa Allotment (not part of this BA). There are 527 acres of critical habitat designated in the very northern portion of the Pine Pasture, adjacent to the town of Pine. However, there are no protected or restricted habitats within this polygon. There is restricted and protected habitat outside of the critical habitat polygon.

PACs occur within the Mogollon Rim area in Bar X/Haigler Creek/Young, and OW Allotments. Only one PAC within the Bar X/Haigler Creek/Young Allotment will be grazed, but not during the breeding season. On the OW Allotment, grazing may occur but, grazing related activities will be restricted so that they occur only outside of the breeding season. No human disturbance or construction actions associated with grazing will occur in PACs on any of these allotments during the breeding season, thus no direct effects are anticipated. Grazing could indirectly impact the watersheds associated with the PACs listed above. Environmental conditions on the allotments within the Mogollon Rim area vary. Some areas are in good condition while others were heavily impacted by the Rodeo-Chediski Fire in 2002. Though grazing may delay the recovery of degraded watershed conditions, under conservative use grazing, range and soil conditions should not degrade, but rather remain stable or improve over time. Incorporation of conservative use should ensure herbaceous cover for the owl prey base remains available. Though cattle frequently congregate in riparian areas and springs due to the steep slopes, much of Canyon Creek (main

water source on the OW Allotment) is fenced to exclude grazing by cattle and elk, which should promote cover for owl prey. Thus, indirect effects are not anticipated. Cumulative effects are expected to be beneficial in the vicinity of the Mogollon Rim due to various ongoing and planned fuels reduction projects that will occur over the next decade (specifically, the Chamberlain Project). Dense canopy cover will be thinned and prescribed fire will be conducted. These open conditions will promote herbaceous growth for an enhanced prey base and reduce the threat of wildfire.

Pinal Mountain Range

All eight PACs located within the allotments listed below were described in detail as part of a BA for the Pinaladera Fuels Management Project (USFS, 2005c). This included occupancy and reproduction data, habitat analysis, and evaluation of critical habitat. This BA included, in its entirety, the BR-W-6 block of designated critical habitat. Total acreage was 52,913 acres but only 6,919 (13%) were suitable as critical habitat as defined by the rule. A total of 5,100 acres were within PACs, and 1,819 acres were restricted or protected habitat outside of the PACs.

The Capitan Allotment is on the very east side of the Pinal Mountains and contains the very southeast corner of Pioneer Pass PAC which is located in the headwater area of Pinal Creek (Map 5). All of the headwaters of Pinal Creek and almost all of this PAC are located in the Mountain Pasture of the Coolidge Parker Allotment. The only habitat in Capitan Allotment is contained in the two western pastures, Maverick and Harvey. Both pastures contain steep slopes and are primarily chaparral with very little (if any) protected or restricted habitat. Of the Pinal Mountain assessment area considered for the Pinaladera Fuels Management Project, only 1,819 acres, out of the 83,532 acre assessment area, outside of PACs met the definition of restricted/protected habitat. This was less that 2.5% (USFS, 2005c). Almost all suitable habitat is outside of this allotment to the west in the Pinal Creek drainage which is part of the Coolidge Parker Allotment.

Coolidge Parker contains two PACs, Ferndell Spring and Pioneer Pass and 9,534 acres of designated critical habitat (Map 8). Both PACs are within the Mountain Pasture which has not been stocked since 2001. The Mountain Pasture was grazed every other summer until cattle were removed and this schedule will be continued when restocking occurs. No recent range condition data is available. Past data indicated poor range condition; however most of the poorer range occurs at lower elevation below owl habitat. The Ferndell Spring PAC occupies the upper drainage basin of Sixshooter Canyon on the north facing slope of Pinal Peak. The Ferndell Spring PAC was occupied in 2003 and 2004. Habitat type includes dense mixed conifer stands grading into ponderosa pine/Arizona white oak. Closed canopy forests have limited herbaceous cover throughout the PAC. Cattle generally congregate in drainages because of the steep slopes. Since the forest is closed canopy and limited herbaceous growth and browse are available, excessive use is unlikely. The Pioneer Pass PAC was occupied in 2000 but surveys in 2003 did not locate owls. Pioneer Pass habitat consists of ponderosa pine/Gambel oak. Habitats along the drainage are relatively open in the Pioneer Pass PAC and the largest trees and best habitat are associated with this riparian corridor. This area is currently in good condition with grasses and other herbaceous growth occupying the understory. The Pioneer Pass Campground is located in this area as well. Slopes on either side of the riparian corridor support more dense stands and mostly closed canopies. When cattle are restocked, use in the riparian area will be monitored closely and cows will be moved below the PAC if conservative use occurs. If necessary, the FS will assess the feasibility of fencing this area to exclude grazing. Alternate summer use should allow for some recovery of the vegetation and conservative use should improve range condition on the allotment. Careful monitoring of use in the best habitat within the PAC should minimize adverse affects associated with grazing during

the breeding season.

The Jones Allotment contains two PACs, Madera Peak North and Frio Spring (Map 17). Both PACs are located on Madera Peak. Grazing may occur along the 580 road, however, much of the PAC is too steep with dense vegetation that limits and restricts grazing use. The allotment is mostly in fair range condition and soils are satisfactory. The Madera Peak North and Frio Spring PACs were occupied in 2003 and 2004. Suitable habitat within Madera Peak North PAC does not meet the definition of restricted habitat, being composed of dense stands of ponderosa pine with Arizona white oak and Emory oak in the understory. Some Gambel oak can be found in the more mesic drainages and in patches on steep north facing slopes. Fuel loading is high with patches of dense manzanita. Bug-killed trees are common, with some stands on the more xeric sites showing nearly complete tree loss. Frio Spring PAC is located on the east side of the north-south ridge to Madera Peak. It is bordered on the north by the Madera Peak North PAC. There is a good stand of ponderosa pine/Gambel oak. This stand is on the north-facing slope of an east-facing bowl in the upper elevation of the PAC. As the aspect in this bowl becomes more southerly, the vegetation changes to ponderosa pine/Arizona white oak. The lower elevations are chaparral. Grazing may occur on flatter areas, but most is too steep with dense vegetation that limits and restricts grazing use. Since both PACs within the Jones Allotment consist of closed canopy forests, limited herbaceous growth and browse are available, and slopes are steep, excessive use is unlikely.

There are two PACs on the Lyons Fork Allotment, Sulfide del Rey and Mill Creek (Map 18). The Mill Creek PAC is directly south of Signal Peak on the northwest facing slopes between Mill Creek and Bobtail Ridge. Livestock were removed for the drought in 2002 and only partial stocking has occurred since. The Mill Creek PAC is in the Bobtail Pasture which will be rested every other year. This PAC was occupied in 2003 and 2004. The Mill Creek PAC is entirely within the Peak Wildfire of 2000. Prior to the fire, the upper 2/3 of this PAC supported a dense stand of ponderosa pine while the lower 1/3 supported chaparral. Most of the overstory in the PAC was completely destroyed. The understory has responded following the fire with a thick growth of live oak, sugar sumac, and Arizona white oak. The only remaining suitable habitat is in small clumps in the more sheltered drainages. Post-fire records of owls have been in these isolated clumps of habitat. A total of 14,355 acres were designated as critical habitat however very little, if any restricted habitat exists outside of the PAC. Sulfide del Rey PAC is located directly south of Frio Spring PAC on Madera Peak. Livestock were removed from the allotment for 2002 through 2004 and partial restocking occurred in 2005. The majority of soils are in satisfactory condition. The Sulfide del Rey PAC was occupied in 2004. Habitat quality is very low. The upper elevations support ponderosa pine/Arizona white oak. Much of the aspect is southerly, resulting in dry exposed conditions. A total of 11,500 acres of critical habitat was designated east of the Frio Springs PAC between this PAC and Madera South PAC in Hobbs Allotment. The Towers Fire of 2002 burned entirely within this PAC completely removing the canopy on 254 acres (40%) of the area. The majority of the PAC contains smaller trees (10-12 inch dbh) and little herbaceous cover. Due to the limited cover and poor habitat conditions, it is unlikely cattle grazing will affect habitat quality. Conservative use should maintain or improve range condition on this allotment.

The Icehouse Canyon PAC is the only PAC within the Ranger Station Allotment (Map 23). It occupies the upper drainage basin of Icehouse Canyon on the north facing slopes of Pinal Peak. The allotment was completely rested in 2002 and 2003 and only partially stocked in 2005. Past data indicated that the range was in poor but improving condition but no recent data is available. The pasture containing Icehouse Canyon PAC is rested every other year. A male owl was present in this PAC in 2003. This PAC along with Ferndell Spring PAC (Coolidge Parker Allotment) occurs within the best habitat in the

Pinal Mountains. The upper slopes of Icehouse Canyon support dense mixed conifer stands (over 200 acres) in addition to stands of ponderosa pine, Arizona white oak, and quaking aspen. These stands were heavily logged in the early part of the last century to provide wood for the mines of Globe. As a result, there are essentially no trees older than about 110 years except in drainage bottoms. The lower third of the PAC supports dense chaparral. Critical habitat (5,659 acres) has been designated on the east facing slopes across the Icehouse Canyon drainage from the PAC. The closed canopy of the forested habitat limits the amount of herbaceous development within the PAC and the majority of ground cover is litter. Additionally, not much browse is available due to the dominance of pine and fir, thus, excessive use is unlikely.

PACs occur in Capitan, Coolidge Parker, Jones, Lyons Fork, and Ranger Station within the Pinal Mountains. Due to limitations in recent data, current range condition and trend data is not accurate, so baseline environmental conditions are not known. However, under current management all but one of the PACs in the Pinals has remained occupied. Grazing may occur within several of the Pinal PACs, but grazing related activities will be restricted so that they occur only outside of the breeding season. No human disturbance or construction actions associated with grazing will occur in PACs during the breeding season, thus no direct effects are anticipated. Grazing could indirectly impact the watersheds associated with the PACs listed above. Though grazing may delay the recovery of degraded watershed conditions, under conservative use grazing, range and soil conditions should not degrade, but rather remain stable or improve over time. Cattle frequently congregate in riparian areas and springs in the Pinals due to the steep slopes. These areas are of critical importance to the owls for foraging and nesting due to the poorer habitat conditions (i.e., closed canopy) on the slopes. In the more well-developed riparian areas, monitoring will be conducted while cows are present to ensure cover is available for owl prey. Even though grazing may occur during the breeding season within PACs, the combination of steep slopes, the limited herbaceous growth and browse available to cattle, and that most drainages within the Pinals are dry, no indirect effects are anticipated. Cumulative effects are expected to be beneficial in the Pinal Mountain Range due to the Pinaladera Fuels Management Project (USFS, 2005c) that will occur over the next decade. Dense canopy cover will be thinned and prescribed fire will be conducted. These open conditions will promote herbaceous growth for an enhanced prey base and reduce the threat of wildfire.

Sierra Ancha Mountain Range

The Tonto Basin Allotment is a large allotment consisting of 118,554 acres (Map 29). In addition to part of the Mount Ord PAC in the Mazatzal Mountains, this allotment contains all of the Bearhead Canyon PAC, the northern portion of Copper Mountain PAC (37 acres), and is 1/10 mile from Buck Basin PAC. The Picture Fire of 2003 burned through the entirety of Bearhead Canyon PAC. A total of 19,292 acres have been designated critical habitat within the Clover/Bearhead and Sycamore Pastures. All livestock was removed for the drought in 2002 and 2003. The allotment was stocked at very low levels in 2004 and 2005. The Bearhead Area has 94% of soils in satisfactory condition and Sycamore has 73% in satisfactory condition. The PACs will not be grazed during the breeding season.

The Armer Mountain Allotment contains no PACs but does contain 19,285 acres of critical habitat in the northern pastures: No Grazing, Hopkins, Salome, Round Mountain. Steer, Thompson, and Boyer Pastures. However, only the northern part of Salome and Hopkins and the No Grazing Pastures are above 4,500 feet in elevation. The northern pastures may be used for foraging by owls occupying PACs in close proximity. The nearest PACs are Armer and Horse, both of which are in the vacant A-Cross Allotment to the east. There is a cluster of 13 PACs to the east. Armer and Horse PACs are the western

edge of this group of PACs. All livestock were removed for the drought in 2003 and the allotment has not yet been restocked. A higher percentage of satisfactory soils are found in the northern pastures which contain critical habitat.

The Center Mountain Allotment contains 5 PACs: Center Mountain, Devil's Chasm, Cold Water Canyon, Pueblo Canyon, and Cold Springs (Map 6). There is approximately 9,015 acres of designated critical habitat. All livestock were removed in 2002 for the drought and stocking at reduced levels resumed in 2004 and 2005. The PACs were occupied when last monitored in 1994, but their current status is unknown. This allotment contains two pastures that are grazed every other summer unless excessive use is documented, which results in a move to the other pasture. Thus, during years of heavy use, it is possible that the entire allotment could be used in consecutive years. The majority of the Devil's Chasm PAC is within two adjacent canyons. This PAC was visited in November 2006 to determine if cattle could access the owl habitat. There was evidence of conservative livestock use only in the extreme eastern portion of the PAC at the lowest elevation. The rest of the PAC is extremely steep and rocky and no sign of cattle was evident. The owls were recorded in the past further up the canyon greater than 0.5 mile from where the livestock have access. During the November 2006 visit, there was no evidence of livestock activity in the Cold Water and Pueblo Canyon PACs. Because of the heavy cover, steep slopes and lack of water it is doubtful that livestock would utilize these PACs. Photos of this PAC can be found in Appendix 4. Additionally, recent monitoring of Cherry Creek below the PACs has not indicated excessive use. Since grazing is unlikely to occur in these PACs, it is unlikely that the proposed action will adversely affect the owl.

The Poison Springs Allotment contains no PACs or designated critical habitat. The Sierra Ancha Allotment contains portions of seven PACs: Coon Creek, Devil's Chasm, Cold Springs Canyon, Pueblo Canyon, Reynolds Creek, Center Mountain, and Cienega Springs. All of the Coon Creek PAC is within this allotment but only part of the other PACs are included with the remainder being in the Center Mountain Allotment. All PACs and 13,332 acres of designated critical habitat are included in the Oak Creek Mesa Pasture. The Coon Creek Fire (2000) burned 9,600 acres almost entirely within the Oak Creek Mesa Pasture. The fire included all of the Coon Creek and Devil's Chasm PACs as well as portions of the Cold Spring Canyon and Pueblo Canyon PACs. On the Sierra Ancha Allotment all PACs except for the Coon Creek PAC are within the Experimental Forest and excluded from grazing year round. Grazing will not occur on the Coon Creek PAC during the breeding season, but at conservative use levels to comply with the Framework. This pasture is currently stocked but at low levels. Since grazing will not occur in the other PACs, no effects are anticipated.

PACs occur in Tonto Basin, Center Mountain, and Sierra Ancha Allotments. In all allotments, grazing is either excluded during the breeding season or slope and lack of water limit accessibility by livestock. No human disturbance or construction actions associated with grazing will occur in PACs during the breeding season. Because of the factors listed above, no direct effects are anticipated. Grazing could indirectly impact the watersheds associated with the PACs listed above. Due to limitations in recent data, current range condition and trend data is not accurate, so baseline environmental conditions are not known. Though grazing may delay the recovery of degraded watershed conditions, under conservative use grazing, range and soil conditions should not degrade, but rather remain stable or improve over time. Since most PACs are too steep for cattle to access, watershed impacts are expected to be minimal. Incorporation of conservative use should ensure herbaceous cover for the owl prey base remains available. Thus, indirect effects of the action are expected to be insignificant and discountable. No cumulative effects are expected.

Critical Habitat

Allotments containing critical habitat within Unit BR-W-4 are Bar T Bar, Cross F, Diamond, H4, Seven K, Sunflower (Cline Unit), and Tonto Basin. Allotments containing critical habitat within Unit UGM-10 are Bar X/Haigler Creek/Young, Hardscrabble, and OW. Allotments containing critical habitat within Unit BR-W-6 are Capitan, Coolidge Parker, Jones, Lyons Fork, and Ranger Station. Allotments containing critical habitat within Unit BR-W-5 are Armer Mountain, Center Mountain and Poison Springs/Sierra Ancha. Acres by allotment are displayed in Table 3. The amount of restricted and protected habitat within the general designation for the Pinal Mountains is known, however for the remainder of the area restricted and protected is not generally known. Within the Pinal Mountains only 13% of the designated critical habitat is either within PACs or restricted or protected habitat outside of PACs (USFS, 2005c).

Primary constituent elements for the Mexican spotted owl are defined by the published rule (Federal Register, vol. 69, No. 168, August 31, 2004). Livestock grazing and management in the action area would not affect seven of the eight constituent elements (presence or amount of large diameter trees, canopy closure, diversity of tree sizes or tree species, snags, or woody debris in forest stands) for critical habitat for forest types, and the measures outlined in the proposed action are designed to address the remaining element (adequate levels of residual plant cover to maintain fruits, seeds, and allow plant regeneration).

Grazing in general, removes plant biomass from the system and may compact the soil. These changes may influence prey availability and prey habitat conditions. All allotments are either managed under a rest-rotation or deferred rest-rotation grazing strategy that provides for some habitats to be free of livestock grazing at all times. These strategies allow for plants to seed out or bear fruit in many areas of each allotment each year. In addition to rest built into grazing strategies, conservative use standards set for each allotment also provide for residual vegetation. As mentioned above, during a pasture use period the District Ranger will assess grazing use patterns across the pasture, grazing intensity in key areas, and timing of the grazing period to determine if management action is necessary to avoid adverse affects to spotted owls or their habitat.

Determination Of Effect – Mexican Spotted Owl

No effect – Crouch Mesa, Del Shay, Devils Canyon, Hardt Creek, Hardscrabble, Haystack Butte, Potato Butte, Radium, Schoolhouse, Sedow, Superior, Vosburg, Walnut, and Winters Allotments

May affect, not likely to adversely affect – Sunflower, H4, Diamond, Seven K, Bar T Bar, Bar X/Haigler Creek/Young, Center Mountain, OW, Capitan, Tonto Basin, Armer Mountain, Poison Springs/Sierra Ancha, Coolidge Parker, Jones, Lyons Fork, and Ranger Station Allotments

Determination Of Effect – Mexican Spotted Owl designated critical habitat

May affect, not likely to adversely affect – Critical habitat on Bar T Bar, Diamond, H4, Seven K, Sunflower (Cline Unit), Tonto Basin, Bar X/Haigler Creek/Young, OW, Hardscrabble, Armer Mountain, Center Mountain, Poison Springs/Sierra Ancha, Capitan, Coolidge Parker, Jones, Lyons Fork, and Ranger Station Allotments

Chiricahua Leopard Frog (*Rana chiricahuensis*)

Background

The Chiricahua leopard frog was listed as a threatened species without critical habitat on June 13, 2002. Included was a special rule to exempt operation and maintenance of livestock tanks on non-federal lands from the section 9 take prohibitions of the Act.

There has been no consultation at the project level concerning the Chiricahua leopard frog for any of the allotments. The Forest Plans were consulted on for this species with an opinion that found that the Forest Plans would not likely result in jeopardy. There were three reasonable and prudent measures that directed the Forest to protect Chiricahua leopard frogs and its habitat and to monitor populations on National Forest System lands (USFWS, 2005a). The proposed action plus additional surveys described in the following analysis to derive a determination of the effects is within the terms and conditions described in the BO.

The Chiricahua leopard frog is distinguished from other members of the *Rana pipiens* complex by a combination of characters, including a distinctive pattern on the rear of the thigh consisting of small, raised, cream-colored spots or tubercles on a dark background; dorsolateral folds that are interrupted and deflected medially; stocky body proportions; relatively rough skin on the back and sides; and oftentimes green coloration on the head and back. The species also has a distinctive call consisting of a relatively long snore of 1-2 sec in duration. Snout-vent lengths of adults range from approximately 2.1-5.4 in (54-139 mm).

Leopard frogs as a group are habitat generalists that can adapt to a variety of wetland situations. Chiricahua leopard frog habitat includes lakes, rivers, streams, springs, ponds, and man-made structures such as reservoirs, stock tanks, and acequias (Sredl and Jennings, 2005). This frog is found at elevations of 1,000-2,710 m (3,281-8,890 ft). It is occasionally found in livestock drinkers, irrigation sloughs and acequias, wells, abandoned swimming pools, backyard ponds, and mine adits. On the Coronado NF, this species occurs at elevations of 3,281-6,600 ft (1,000-2,013 m). On other Arizona NFs, the frog occurs at elevations of 3,540-8,280 ft (1,080-2,525 m). The frog uses permanent or nearly permanent pools and ponds for breeding. Most sites that support populations of this frog will hold water yearlong in most years. Time from hatching to metamorphosis is shorter in warm water than in cold water; water permanency is probably more important at higher elevations and in the northern portion of the species' range. The species is rarely found in aquatic sites inhabited by non-native fish, bullfrogs, or crayfish. In complex systems or large aquatic sites, this species may occur in the presence of low densities of non-native predators.

In New Mexico, of sites occupied by Chiricahua leopard frogs from 1994 to 1999, 67% were creeks or rivers, 17% were springs or spring runs, and 12% were stock tanks. In Arizona, slightly more than half of historic localities were natural lotic systems, a little less than half were stock tanks, and the remainder, were lakes and reservoirs. Currently, 63% of extant populations in Arizona occupy stock tanks.

The Chiricahua leopard frog is found in central and southeastern Arizona and in west-central and southwestern New Mexico. In Mexico, the species is found in northern Sonora, the Sierra Madre Occidental of Chihuahua, and northern Durango. The species was historically widely distributed on the

Coronado, Gila, and Apache-Sitgreaves NFs. The largest number of extant localities is on the Coronado NF. The distribution of the species in Mexico is unclear due to limited survey work and the presence of closely related taxa (especially *Rana montezumae*) in the southern part of the range of the Chiricahua leopard frog.

An understanding of the dispersal abilities of Chiricahua leopard frogs is key to determining the likelihood that suitable habitats will be colonized from a nearby extant population of frogs. In August 1996, Rosen and Schwalbe (1998) found up to 25 young adult and subadult Chiricahua leopard frogs at a roadside puddle in San Bernardino Valley, Arizona. They believed that the only possible origin of these frogs was a stock tank located 3.4 mi (5.5 km) away. Rosen et al. (1996) found small numbers of Chiricahua leopard frogs at two locations in Arizona that consecutively supported large populations of non-native predators. The authors suggested these frogs could not have originated at these locations because successful reproduction would have been precluded by predation. They believed the likely source of these animals was populations 1.2-4.3 mi (2-7 km) distant. In the Dragoon Mountains of Arizona, Chiricahua leopard frogs breed at Halfmoon Tank, but frogs occasionally turn up at Cochise Spring (0.8 mi [1.3 km]) down the canyon from Halfmoon Tank in an ephemeral drainage), and in Stronghold Canyon located 1.1 mi (1.7 km) down the canyon from Halfmoon Tank. Breeding habitat for Chiricahua leopard frogs at Cochise Spring or Stronghold Canyon does not exist, thus it appears observations of frogs at these sites represent immigrants from Halfmoon Tank. In the Chiricahua Mountains, a population of Chiricahua leopard frogs disappeared from the Silver Creek stock tank after the tank dried up, but frogs then began to appear in Cave Creek, which is about 0.6 mi (1.0 km) away, again suggesting immigration. Movements away from water do not appear to be random. Streams are important dispersal corridors for young northern leopard frogs (Seburn et al., 1997). Displaced northern leopard frogs will "home" and apparently use olfactory, auditory, and possibly celestial orientation as guides (Dole, 1968; 1972). Rainfall or increased ambient humidity may be an important factor in dispersal because odors carry well in moist air, making it easier for frogs to find other wetland sites (Sinsch, 1991).

Important definitions when discussing Chiricahua leapard frog include the following:

> Suitable habitat – Lakes, rivers, streams, springs, ponds, and man-made structures such as reservoirs, stock tanks, and acequias that are located above 4,800 feet (for the TNF).
> Occupied habitat - sites where the frog is known to occur or where it was present within the last 10 years, but no follow-up surveys have been conducted confirming its absence and suitable habitat is present.
> Likely to be occupied habitat - 1) currently suitable habitat where the frog has been documented within the last 10 years, but is apparently now absent or 2) suitable habitat that is (a) within 1 mi overland of occupied habitat, (b) within 3 mi along an ephemeral or intermittent drainage from occupied habitat, or (c) within 5 mi along a perennial stream from occupied habitat.

AGFD biologists conducted 871 surveys at 679 localities, 98 of them historical. To date, the Chiricahua leopard frog appears absent from 82% of the historical localities surveyed since 1990 (http://biology.usgs.gov/s%2Bt/SNT/index.htm). Chiricahua leopard frogs were observed in 21 northern sites from 1994 to 2001 (USFWS, 2002b). Numerous surveys were conducted all over the TNF in 1992 and 1993 by AGFD (Sredl et al., 1994). Four extant populations were found on the Pleasant Valley Ranger District and Payson Ranger District possibly has one extant population. There are no known extant populations of Chiricahua leopard frog on Globe, Mesa, or Tonto Basin Ranger Districts (USFWS, 2005a). Northern populations of the Chiricahua leopard frog along the Mogollon Rim and in

the mountains of west-central New Mexico are disjunct from those in southeastern Arizona, southwestern New Mexico, and Mexico.

More comprehensive reviews of Chiricahua leopard frog life history, status, conservation, and range can be found in USFWS (2002b, 2005a).

Status In The Action Area

No extant populations of Chiricahua leopard frog are currently known within the action area. Populations occurred historically at Upper Tank and an unnamed tank southwest of Upper Tank (surveys 1982 through 1993) both within the Crouch Mesa Allotment (Map 9). However, bullfrogs were found in both tanks in 1993, and no Chiricahua leopard frogs were found in 1994. In 2003 bullfrogs and tiger salamanders were found, but again no Chiricahua leopard frogs.

There is a historical population of Chiricahua leopard frogs that was located on the San Carlos Indian Reservation approximately 3 miles overland from the nearest section of Ash Creek. This population was within and between Upper Highway Tank and Highway Tank on the Sawmill and Tanks Canyon, a separate tributary to the Salt River. More specific discussion on the possible occurrence of the CLF in the Ash Creek area is discussed below.

More information on allotments containing habitat for Chiricahua leopard frogs can be found in Table 5.

Table 5. Allotments Containing Habitat for Chiricahua Leopard Frogs.

Allotment Name	Historic or Occupied Sites	Aquatic Habitats	Closest Known Populations
Seven K (Mazatzal Mountains)	No Known Sites. Not likely to be present within the Mazatzal Mountains. Big Pine Spring surveyed in 2004, spring was dry	Area above 4800 feet. Buck Basin Pasture (Big Pine Spring)	Over 30 miles away, northeast of Payson, AZ
Bar T Bar (Mazatzal Mountains)	No Known Sites. Not likely to be present within the Mazatzal Mountains.	Area above 4800 feet. Bull Pasture (Windsor Spring, Bars Canyon, Y Bar tanks, Bear Spring, Deer Creek) and South Bull Pasture (Pigeon Spring, South Fork Deer Creek).	Over 25 miles away northeast of Payson, AZ.
H4 (Mazatzal Mountains)	No Known Sites. Not likely to be present within the Mazatzal Mountains. Mt. Ord Trough Spring surveyed in 2004.	Area above 4800 feet. Brunson South Pasture (Mt. Ord Trough Spring and Oak Spring Canyon)	Over 25 miles away northeast of Payson, AZ.

Allotment Name	Historic or Occupied Sites	Aquatic Habitats	Closest Known Populations
Tonto Basin (Mazatzal Mountains)	No Known Sites. Not likely to be present within the Mazatzal Mountains. Bear Spring, Edwards Park Tank, Little Pine Flat, Circle M Spring, Unnamed spring above Jolene Mine surveyed in 2004.	Area above 4800 feet. Mount Ord Pasture (Sycamore Canyon, Cloudburst Canyon, Reno Creek), Sycamore Pasture (Bear Spring, Park Creek, Edwards Park Tank, Circle M Spring, Unnamed spring above Jolene Mine).	Approximately 35 miles NE on Pleasant Valley RD or Payson RD.
Diamond (Mazatzal Mountains)	No Known Sites. Not likely to be present within the Mazatzal Mountains	Three springs above 4,800 feet.	Nearest Population is over 30 miles away on Payson and Pleasant Valley RD
Sunflower (Four Peaks)	No Known Sites. Not likely to be present within the Mazatzal Mountains or Four Peaks.	Four springs above 4,800 feet.	Nearest Population is over 30 miles away on Payson and Pleasant Valley RD.
Tonto Basin (Sierra Ancha Mountains)	No known sites. Numerous surveys.	Area above 4800 feet. All permanent water in Clover/Bearhead Pastures (Sierra Ancha). Numerous surveys with negative results.	Approximately 25 miles on Pleasant Valley RD
Crouch Mesa (Mogollon Rim)	Crouch Creek, Cherry Creek Drainage (above allotment), upper tank, unnamed tank above upper tank,	All suitable habitat surveyed in 2003.	Populations occur within this allotment.
Bar X/Haigler Creek/Young (Mogollon Rim)	No Chiricahua leopard frogs have been found during surveys on this allotment.	Suitable habitat has been surveyed. No populations have been found in Haigler Creek.	Nearest known population is 3.5 miles upstream in the Cherry Creek drainage.
Haystack Butte	There are no records from the Globe District. This District was historically inhabited by lowland leopard frogs.	Two tanks above 4,800 feet in Bronson and Upper Ash Creek Pastures.	Reservation

Allotment Name	Historic or Occupied Sites	Aquatic Habitats	Closest Known Populations
Sedow	There are no records from the Globe District. This District was historically inhabited by lowland leopard frogs.	Two tanks in New Corral Pasture above 4,800 feet.	Reservation

Effects Analysis

The Framework outlines that all of the criteria must be met for making a "no effect" determination on Chiricahua leopard frogs:

1. Chiricahua leopard frogs are not present within the action area.
2. No livestock grazing or livestock management activities will occur within areas where frogs are reasonably certain to occur or where there is likely to be occupied (suitable) habitat which includes:
    a. Currently suitable habitat where the frog has been documented within the last 5 years, but is apparently now absent or,
    b. Suitable habitat that is:
        i. within 1 miles overland of occupied habitat,
        ii. within 3 miles along an ephemeral or intermittent drainage from occupied habitat, or
        iii. within 5 miles along a perennial stream from occupied habitat.

In order to make a "may affect, not likely to adversely affect" determination, the Framework requires each of the following criteria be met:

1. There will be no livestock use or livestock management activities in the action area, where the species may be present (grazing is allowed in non-occupied suitable habitat).
2. Indirect effects occurring within the action area, where the frog is reasonably certain to occur, which result from upland livestock grazing are determined to be insignificant or discountable.
3. Proposed livestock management activities, within the action area, will not increase the likelihood that non-native predators or chytrid fungi will colonize or be introduced to such aquatic sites.

Chiricahua leopard frog habitat is not present on the Capitan, Coolidge Parker, Del Shay, Devils Canyon, Hardt Creek, Jones, Lyons Fork, Radium, Ranger Station, Schoolhouse, Superior, Walnut, and Winters Canyon Allotments, therefore, no direct, indirect, or cumulative effects are expected on these allotments.

Chiricahua leopard frog habitat is present on the Seven K, Armer Mountain, Bar T Bar, H4, Tonto Basin, Poison Springs/Sierra Ancha, Diamond, Sunflower, Tonto Basin, Center Mountain, Crouch Mesa, Bar X/Haigler Creek/Young, OW, Haystack Butte, Hardscrabble, and Sedow Allotments.

Direct effects of grazing in Chiricahua leopard frog habitat include trampling of adults, eggs, tadpoles, or breeding habitat. Indirect effects could result from soil degradation associated with hoof action. This

can cause runoff which results in excess sedimentation in ponds. Additionally, livestock can transport chytrid fungus and/or predatory fishes or bullfrogs to breeding ponds. Cumulative effects could occur if future projects planned in the vicinity of habitat resulted in habitat degradation. The USFS, in conjunction with AGFD and USFWS, has established emergency recovery actions for the Chiricahua leopard frog on the TNF. These actions are designed to improve occupied and suitable habitat for leopard frogs which will improve connectivity of habitat and thus the probability of future occupation within some allotments in this biological assessment. Details of these activities can be found in *Chiricahua Leopard Frog Emergency Recovery Program: Phase I*, which is on file at local USFS, AGFD, and USFWS offices.

Mazatzal/Four Peaks Mountains

The Seven K, Bar T Bar, H4, Diamond, and a portion of the Tonto Basin Allotment occur in the Mazatzal Mountains while the Sunflower Allotment is in the Four Peaks area. These allotments are separated by great distances from any known Chiricahua leopard frog populations. There have been no historical sightings for Chiricahua leopard frogs and there are no known extant populations within the Tonto Basin or Mesa Ranger Districts which include these mountains (USFWS, 2005a). The potential for finding any new populations are slim to none (Mike Sredl, personal communications, September 15, 2005). There is limited perennial water above 4,800 feet on these allotments. Heidi Plank, Tonto Basin District Biologist, found no Chiricahua leopard frogs during surveys conducted during the summer of 2004 for Big Pine Spring (Seven K Allotment), Bear Spring, Unnamed Spring near Jolene Mine, Edwards Park AZGF water, Little Pine Flat AZGF water, Circle M Springs (Tonto Basin Allotment), and Mount Ord Trough Springs (H4 Allotment). Due to the fact that these surveys have been unsuccessful, the Chiricahua leopard frog is not likely to be present within the Mazatzal Mountains or Four Peaks area. Thus, no direct, indirect, or cumulative effects are anticipated for the Seven K, Bar T Bar, H4, and Diamond Allotments as a result of the proposed action.

Sierra Ancha Mountains

Even though no historical or extant populations are known to occur here and the nearest extant population is approximately 15 miles to the north, there is not clear isolation between the area below the Mogollon Rim and the Sierra Ancha Mountains. Therefore, we cannot automatically determine that this species is not likely to be present in the Sierra Ancha Mountains. Almost all waters within the Clover/Bearhead Pasture of the Tonto Basin Allotment are over 4,800 feet in elevation. A total of three surveys have been conducted within the Clover/Bearhead Pasture and an additional 21 surveys within five miles of the pasture all with negative results (Sredl et al., 1994). The majority of the Salome and Hopkins pastures on the Armer Mountain Allotment are above 4,800 feet. Surveys were conducted in 2005 along Reynolds, Workman, Deer, and Bear Creeks all with negative results. Sixteen surveys were completed within five miles of the Armer Mountain Allotment with negative results (Sredl et al. 1994). The Oak Creek Mesa Pasture on the Poison Springs/Sierra Ancha Allotment is above 4,800 feet. Six surveys have been conducted within 5 miles of the Poison Springs/Sierra Ancha Allotment with negative results (Sredl et al., 1994). Based on these surveys the likelihood of this species occurring is very low. If this species is found in future surveys, the site will be protected and consultation will be reinitiated.

Direct effects could occur if frogs were found on the Tonto Basin, Poison Springs/Sierra Ancha, or Armer Allotments within the Sierra Ancha Mountains. If future surveys detect frogs, the sites will be secured and consultation will be reinitiated. Though grazing may delay further recovery of the watershed, under conservative use grazing, already good range and soil conditions should remain stable or improve over time. Therefore, indirect effects resulting from upland livestock grazing to Chiricahua

leopard frog are not likely to reach the level where take would occur, thus these indirect effects are insignificant or discountable to Chiricahua leopard frogs on the Tonto Basin, Armer, and Poison Springs/Sierra Ancha Allotments. Furthermore, it is unlikely the action will lead to an increase in the likelihood that non-native predators or chytrid fungi will be spread to any additional waters where they currently do not exist. No cumulative effects are anticipated as a result of the proposed action.

Mogollon Rim

The Crouch Mesa, Bar X/Haigler Creek/Young, Center Mountain, Hardscrabble, OW, Potato Butte, and Vosburg Allotments occur below the Mogollon Rim in suitable Chiricahua leopard frog habitat. Chiricahua leopard frog populations occur along Crouch Creek, and in the Cherry Creek drainage, both locations being above the Crouch Mesa Allotment. Populations occurred historically at Upper Tank and an unnamed tank southwest of Upper Tank (Map 9; surveys 1982 through 1993). However, bullfrogs were found in both tanks in 1993, and no Chiricahua leopard frogs were found in 1994. In 2003 and 2005 bullfrogs and tiger salamanders were found, but again no Chiricahua leopard frogs. Dispersal to the Crouch Mesa Allotment from sites occupied by Chiricahua leopard frogs would require going overland approximately 1.7 miles to reach suitable habitat (Map 9; Upper Tank). Frogs dispersing from the Crouch Creek occupied site would have to travel approximately 2 miles downstream to reach waters within the Crouch Mesa Allotment. This reach of Crouch Creek is intermittent and includes a waterfall area that is over 100 feet with cliffs in both directions from the waterfall. The waters within the Crouch Mesa Allotment are considered unoccupied suitable habitat due to recent negative surveys and the presence of bullfrogs and tiger salamanders. In the event management activities for leopard frogs are successful and populations begin to expand, portions of the Crouch Mesa Allotment may be resurveyed. If detected, the site will be protected.

No Chiricahua leopard frogs have been found during surveys on Bar X/Haigler Creek/Young Allotments. Frog populations occur in the Cherry Creek drainage (Bottle Spring) above the allotments. Haigler Creek and Naegelin Canyon were surveyed in 2005 with negative results. No populations have ever been identified in the Haigler Creek drainage. In the lower reaches where Cherry Creek is perennial, several exotic fish species have been recorded during surveys, including green sunfish, black bullhead, yellow bullhead, flathead minnow, red shiner, flathead catfish, and carp. Within the Bar X Allotment, bullfrogs have been recorded in Grasshopper Tank. The only unsurveyed likely to be occupied habitat is on the Young Allotment in Round Mountain Pasture. This is approximately 3.5 miles down a perennial reach of the Cherry Creek drainage from the Bottle Spring occupied site (Map 4). This pasture is currently not being grazed. For grazing to occur in the future, surveys must be conducted annually. If frogs are found, the site will be protected. One unnamed drainage within the Potato Butte Allotment has been surveyed with negative results.

With the exception of the Round Mountain Pasture, all current likely to be occupied habitats have been surveyed and no Chiricahua leopard frogs were found so no direct effects are anticipated. The Forest will conduct surveys annually within the dispersal area from known frog populations. Additionally, as time and budgets allow, suitable habitats within the above allotments will be surveyed for presence of this species. If future surveys detect frogs, the sites will be secured and consultation will be reinitiated.

Grazing could indirectly impact leopard frog breeding habitat. With good watershed conditions over the majority of suitable habitat on the Mogollon Rim allotments and implementation of conservative use, grazing should not degrade, but rather maintain or improve range and watershed condition over time. Therefore, indirect effects resulting from upland livestock grazing to Chiricahua leopard frog on the above allotments are not likely to reach the level where take would occur. Furthermore, it is unlikely the

action will lead to an increase of the likelihood that non-native predators or chytrid fungi will be spread to any additional waters where they currently do not exist. Thus indirect effects are anticipated to be insignificant or discountable. No cumulative effects are anticipated as a result of the proposed action.

Ash Creek

The Haystack Butte Allotment is associated with Ash Creek on the Globe Ranger District. The Sedow Allotment is not within the Ash Creek watershed, but is adjacent to it. No known historical or extant populations of Chiricahua leopard frog exists within the Globe Ranger District. The Regional BO (USFWS, 2005a) established baseline populations of the CLF for the TNF. No populations were identified for the Globe Ranger District.

There are historical records (prior to 1979) of Chiricahua leopard frogs on the San Carlos Indian Reservation approximately 3 miles overland from the nearest section of Ash Creek on the Chrysotile Allotment which is adjacent to the Haystack Butte and Sedow Allotments. Historically, this population was within and between Upper Highway Tank and Highway Tank on the Sawmill and Tanks Canyon, a separate tributary, which eventually drains into the Salt River near Mule Hoof Bend. Since no recent substantiated survey evidence is available on the status of the Chiricahua leopard frog on the San Carlos Reservation, we cannot assume that the species is absent from the historic site.

No records for CLF exist on the Haystack Butte Allotment, nor do any waters on the allotment meet the the definition of likely to be occupied habitat. Ash Creek flows through the Haystack Butte Allotment prior to flowing into the Salt River. All perennial flows of Ash Creek including the tributaries to Butte Creek, Bronson Canyon are below 5,000 feet elevation. Waters on the Haystack Butte Allotment (Map 16) above 4,800 feet that occur in Bronson Pasture are Basin Tank, an unnamed tank in Section 8, Bronson and Sanders Springs while waters above 4,800 feet in the Upper Ash Creek Pasture are Cypress Tank, unnamed springs in section 18, at the end of 360 road, New Coral Spring at the end of 1018 road, head of a tributary to Hess Creek in Section 25, unnamed spring in Steer Pasture, 2 unnamed springs in Rock Springs Pasture, unnamed spring in Storm Canyon, unnamed spring on Yankee Joe Canyon, and unnamed spring in Hudson Pasture. Habitat quality is believed to be low on the Haystack Butte Allotment. If future surveys on the adjacent Chrysotile Allotment indicate the Chiricahua leopard frog is present, then additional surveys will be conducted on the Haystack Butte Allotment.

No records for CLF exist on the Sedow Allotment, nor do any waters on the Sedow allotment meet the the definition of likely to be occupied habitat. No recent surveys have been conducted on the Sedow Allotment, but the lack of detection thus far on the adjacent Chrysotile Allotment suggest the likelihood of occurrence is low. If future surveys on the Chrysotile Allotment detect CLF within dispersal distance of the Sedow Allotment, then the presence of the CLF on the allotment will be revisited.

If frogs did occur in the action area, livestock could directly effect frogs by trampling adults, egg masses, or tadpoles. Due to the large number of negative surveys on the Chrysotile Allotment it is unlikely that frogs are present within the Haystack Butte or Sedow Allotments. The FS will survey the suitable sections of Ash Creek on the adjacent Chrysotile Allotment over the next three years. Additionally, a subset of suitable waters on the Chrysotile Allotment will be surveyed in 2007. If the CLF is detected on the Chrysotile Allotment, provisions would then also be made to survey the most likely to be occupied areas within the Haystack Butte and Sedow Allotments.

Grazing could indirectly impact leopard frog breeding habitat on the Haystack Butte and Sedow Allotments if the frog were present. With implementation of conservative use, grazing should not degrade, but rather maintain or improve range and watershed condition over time. Therefore, indirect

effects resulting from upland livestock grazing to Chiricahua leopard frog on the above allotments are not likely to reach the level where take would occur. Furthermore, it is unlikely the action will lead to an increase of the likelihood that non-native predators or chytrid fungi will be spread to any additional waters where they currently do not exist. Thus indirect effects are anticipated to be insignificant or discountable. No cumulative effects are anticipated as a result of the proposed action.

Determination Of Effect – Chiricahua Leopard Frog

No effect – Capitan, Coolidge Parker, Del Shay, Devils Canyon, Hardt Creek, Jones, Lyons Fork, Seven K, Bar T Bar, H4, Diamond, Radium, Ranger Station, Schoolhouse, Sunflower, Superior, Walnut, and Winters Allotments

May effect, not likely to adversely affect – Tonto Basin, Crouch Mesa, Armer Mountain, Center Mountain, Hardscrabble, OW, Potato Butte, Poison Springs/Sierra Ancha, Vosburg, Bar X/Haigler Creek/Young, Haystack, and Sedow Allotments

Southwestern Willow Flycatcher (*Empidonax traillii extimus)*

Background

The southwestern willow flycatcher was listed as endangered March 29, 1995. Critical habitat was designated for the flycatcher on November 18, 2005.

One of four currently recognized willow flycatcher subspecies (Phillips, 1948; Unitt, 1987), the southwestern willow flycatcher (flycatcher) is a neotropical migrant that breeds in the southwestern United States and migrates to Mexico, Central America, and extreme northern South America during the nonbreeding season (Phillips, 1948). This subspecies begins arriving on breeding grounds in Arizona and New Mexico in late April and early May (Maynard, 1995; Sferra et al., 1995). Flycatchers generally leave the United States by mid-September. It is an insectivorous bird and hunts by perching on a branch and making short, direct flights, also called sallies, to capture flying insects. Nesting begins in late May and early June, and renesting attempts can continue into late July (with late fledging to mid-August). Flycatchers lay three to four eggs (smaller clutch sizes with successive renests) and incubate for 12-13 days. Fledging occurs in 12-15 days.

Habitat for the flycatcher can be qualified as either occupied, indicating it is currently used for breeding; suitable, indicating it contains all the components of breeding habitat but flycatchers have not been detected in the area or the area has not been surveyed; potential, indicating the area is likely to develop into suitable habitat but is not currently suitable; or migratory, indicating the area is likely used by flycatchers migrating into or out of the area.

The flycatcher is a riparian obligate, nesting along rivers, streams, and other wetlands where dense growths of willow (*Salix* spp.), baccharis (*Baccharis* spp.), buttonbush (*Cephalanthus occidentalis*), boxelder (*Acer negundo*), saltcedar (*Tamarix* spp.) or other plants are present, often with a scattered overstory of cottonwood (*Populus* spp.) and/or willow. Historic nest locations of the flycatcher throughout its range are not well known. It is not known whether the habitats where they are located today are representative of all the different habitat types they could use for nesting. The flycatcher's use of dense salt cedar at the inflows or perimeter of human-made lakes in Arizona, along with canopy use of mature box elders along water ditches in southwestern New Mexico, are indicative of how this subspecies uses a variety of habitats. Understanding the full range of potential flycatcher habitats is complicated by human-caused watershed changes, patchy flycatcher distribution, and low flycatcher

population numbers.

As populations recover, flycatchers could occupy riparian habitats that today might be considered marginal or unsuitable. Patches of dense, multi-storied vegetation found on broad portions of otherwise steep, narrow creeks, can become secondary habitat for nesting flycatchers after preferred habitats are occupied. Applying rigid requirements for flycatcher potential habitat based on current understanding may not be the most appropriate way to recover the species. The following habitat descriptions should be used as guidance, due to the need for further information about factors that lead to flycatcher site occupation.

The flycatcher nests in dense riparian vegetation that is generally taller than 3-4 m, depending on elevation and vegetation types, with a high percentage of canopy cover, and often along rivers, streams, swamps, seeps, irrigation ditches, or other wetlands. Perennial flow, surface water, or saturated or moist soil is usually located in, adjacent to, or nearby nesting areas from April through September. The distance between the nest and these hydrologic conditions is documented to be as far as 120-150 m, especially when subsurface flow is keeping soils moist around the site. More typically, the nest is within 50-100 m of these hydrologic conditions. Farther distances have also been observed, especially in situations where reservoirs have receded (USFWS, 2002c).

In Arizona, the flycatcher historically ranged along major river systems and probably major tributaries. Historical records exist from the Colorado River near Lee's Ferry and near the Little Colorado River confluence (A. Phillips, pers. comm., cited in Unitt, 1987), the Santa Cruz River near Tucson (Swarth, 1914; Phillips, 1948), the Verde River at Camp Verde (Phillips, 1948), the Gila River at Fort Thomas (W.C. Hunter, pers. comm., cited in Unitt, 1987), the White River, the upper and lower San Pedro River (Willard, 1912; Phillips, 1948), and the Little Colorado River headwaters area (Phillips, 1948). Currently, resident flycatchers occur along 12 drainages in Arizona, including the Colorado, Bill Williams, Verde, Salt, Tonto Creek, Big Sandy, Gila, San Pedro, Santa Maria, Little Colorado, San Francisco, and Hassayampa drainages (Paradzick et al., 2000; Sferra et al., 1995, Spencer et al., 1996). The flycatcher occurs in Arizona on the Apache-Sitgreaves and TNFs, and on private land near the Prescott and Coconino NFs.

Roosevelt Lake provides breeding habitat for one of the largest populations of flycatchers in the state of Arizona. In this area occupied and suitable habitat for the flycatcher consists of dense riparian vegetation which can contain native willow and cottonwood stands, mixtures of native willow/cottonwood and exotic salt cedar, and stands comprised mostly of exotic salt cedar. Native, mixed, and non-native vegetation types are all used as breeding habitat by the flycatcher (Sogge et al., 2003). Lake fluctuations due to drought, reservoir draw downs or climatic events make available nesting habitat in and around the Roosevelt Lake bottom spatially dynamic. At the Salt River inflow to the lake dense riparian vegetation and occupied habitat occurs from the edge of the lake upstream to the area of Meddler point. Traveling upstream on the Salt River from Meddler point, suitable habitat occurs in patches within the floodplain of the river.

At the Tonto Creek inflow to the lake dense riparian vegetation and occupied habitat occurs from the edge of the lake upstream to the A-cross road. Traveling upstream on Tonto Creek from the A-cross road, occupied habitat occurs in patches within the floodplain of the creek up to Punkin Center. Suitable habitat continues upstream in patches from Punkin Center to Gisela. Greenback Creek, which flows into Tonto Creek approximately one mile upstream from Roosevelt Lake, contains potential habitat for the flycatcher. Rye Creek, which flows into Tonto Creek approximately 22 miles upstream from Roosevelt Lake, contains narrow band of suitable habitat for the flycatcher.

Designated critical habitat for the species occurs on Tonto Creek from the high water level of the lake upstream to the confluence with Rye Creek and on the Salt River from the diversion dam upstream to the confluence with Cherry Creek. Critical habitat was not designated in the bed of Roosevelt Lake, though this area does contain occupied habitat and is important habitat for the flycatcher. The Roosevelt Habitat Conservation Plan covers this area and as a result of the protections provided from the Habitat Conservation Plan and by the TNF, the area was excluded from critical habitat designation. Extensive surveys have been conducted at Roosevelt Lake since 1996 (Table 7), survey information from the 2004 field season resulted in observations of 41 pairs along Tonto Creek from the Bar X crossing to the Orange Peel campground, and 80 pairs on the Salt River (Newell et al., 2005; Munzer et al., 2005). Survey data from 2005 indicates there were 63 pairs on Tonto Creek and 48 pairs on the Salt River (English et al., 2006).

A more extensive review of Flycatcher ecology can be found in the USFWS (2005c) and USFWS (2002c). Table 6 shows allotments and major streams within the allotments that may be of importance to migrating flycatchers.

According to Tibbitts and Sogge (1997), other threats to the flycatcher include loss of breeding habitat due to urban, recreational, and agricultural development; water diversion and recreational uses; and hydrology changes resulting from these and other land uses. In addition, USFWS (2002c) lists pesticide contamination, predation, and replacement of native riparian vegetation by exotic tamarisk as threats. Cattle grazing can have direct and indirect impacts on flycatcher habitat. Direct impacts include feeding on riparian habitats, reducing the overall vegetation density and trampling understory vegetation in flycatcher habitat. Livestock grazing in watershed uplands above riparian systems can cause bank destabilization, increased runoff, increased sedimentation, increased erosion and reduced capability of soils to hold water. Additionally cattle in the vicinity of flycatcher breeding areas can attract brown-headed cowbirds, which lay their eggs in the nest of the flycatcher (USFWS 2002c).

Status In The Action Area

No habitat for Southwestern willow flycatchers is expected to occur on the Bar T Bar, Capitan, Coolidge Parker, Diamond, Jones, Lyons Fork, Radium, Ranger Station, Sunflower, Superior, and Winters Allotments.

For the following allotments there is no currently suitable breeding habitat and no critical habitat, however these allotments may be used by migrating flycatchers; Bar X/Haigler Creek/Young, Center Mountain, Crouch Mesa, Devils Canyon, Hardscrabble, Haystack Butte, OW, Potato Butte, Sedow, and Vosburg.

Willow flycatcher breeding and/or critical habitat can be found on or immediately adjacent to the Armer Mountain, Del Shay, H4, Hardt Creek, Poison Springs/Sierra Ancha, Schoolhouse, Seven K, Tonto Basin, and Walnut allotments. Due to their proximity to breeding habitat it is possible that portions of all these allotments may be used by migrating flycatchers.

Table 6. Allotments with or adjacent to occupied, suitable, potential, or critical habitat for southwestern willow flycatchers.

Allotment Name	Flycatcher habitat within or adjacent to the allotment	Distance to closest nest in 2004	Distance to closest nest in 2005
Armer Mountain	Roosevelt Lake bed when lake levels are low	Habitat accessible from Lake pasture	2 miles
Del Shay	Tonto Creek	7.5 miles	7.5 miles
H4	Tonto Creek	7.5 miles	7.5 miles
Hardt Creek	Tonto Creek	10.5 miles	10.5 miles
Poison Springs/ Sierra Ancha	Salt River inflow to Roosevelt Lake	Habitat accessible from West Highway pasture	Less than 0.1 miles
Seven K	Tonto Creek	Less than 0.1 miles	Less than 0.1 miles
Schoolhouse	Roosevelt Lake bed when lake levels are low	2 miles	4 miles
Tonto Basin	Tonto Creek and Roosevelt Lake bed when lake levels are low	Within the Tonto Creek Riparian Unit of the Allotment, and accessible from the Lake and Methodist/Bathtub pastures	Within the Tonto Creek Riparian Unit of the Allotment
Walnut	Tonto Creek	1 mile	1 mile

Effects Analysis - Migratory Southwestern Willow Flycatchers

Migrant birds have been detected in riparian habitat suitable and unsuitable for nesting and may occur in non-riparian areas. For the action area associated with the allotments being considered the primary consideration, in a metapopulation sense, is connectivity between breeding bird populations.

The migratory route flycatchers travel to known breeding populations from their wintering areas is unknown. Flycatchers are known to use major drainages. It is conceivable that some may fly overland utilizing smaller drainages as they are encountered making all riparian areas important.

The closest breeding metapopulations to allotments north of the upper Salt River (Bar X/Haigler Creek/Young, Center Mountain, Crouch Mesa, OW, Potato Butte, and Vosburg Allotments) are to the

south and are associated with Roosevelt Lake. There are no primary breeding populations directly to the north and no critical habitat has been designated. It would not be expected for birds to utilize the upper Salt beyond Cherry Creek or the tributaries north of the Salt River for immigration or emigration to or from other breeding populations because no populations are known at this time. It is not likely that new breeding flycatcher populations will become established within or near these allotments during the life of the grazing permit due to unsuitable habitat conditions. Based on the lack of breeding metapopulations other than those associated with Roosevelt Lake, the value of any of the tributaries to the Salt River originating to the north for travel between metapopulations is very low.

The Haystack Butte and Sedow Allotments include sections of the Salt River above Cherry Creek or its tributaries from the south. The river corridor is excluded from grazing either by fencing or by topography. Ash Creek is the primary tributary to the Salt River with perennial stream sections and riparian that flows through the Haystack Butte Allotment. Most of Ash Creek is accessible to livestock but portions above 4,800 feet will be fenced in the future.

The Devils Canyon Allotment is located near Superior immediately south of the head waters of Pinto Creek. It appears feasible that flycatchers would use the drainages of Devils and Rawhide Canyon that would be a direct northerly route to the headwaters of Pinto Creek that flows into the Salt River at Roosevelt Lake. Riparian habitat is located in two pastures, Kitty Joe and Sycamore Riparian consisting of 5,376 acres. These two riparian pastures are only grazed during the winter being alternately grazed during the January to March and October to December use periods. During a three year cycle, each of these two pastures receives two grazing use periods followed by one 12 month rest period and one 18 month rest period.

The Hardscrabble Allotment is in the vicinity of the Verde and East Verde Rivers. The allotment is located 2.5 miles north of East Verde River and approximately 8.5 miles east of the Verde River. It is conceivable that the area could be used as stopover sites for flycatchers breeding on private lands to the north. Prominent drainages found within the allotment are Walnut Canyon, Rock Creek (tributary to Walnut Canyon), and Oak Spring Canyon (tributary to Pine Creek which is just outside of the allotment).

The allotments around Roosevelt Lake and Tonto Creek; Armer Mountain, Del Shay, H4, Hardt Creek, Poison Springs/Sierra Ancha, Schoolhouse, Seven K, Tonto Basin, and Walnut, occur immediately adjacent to occupied habitat and therefore it is likely that some areas on these allotments are used by migrating flycatchers.

Some of the riparian areas in these allotments are excluded from livestock and others are inaccessible due to steep terrain. In allotments where grazing and migratory flycatchers may co-occur, no direct effects are anticipated since birds will likely fly away from the disturbance. Indirect effects could occur by alteration of riparian habitat or effecting watershed conditions. Guidance provided in USFS (2002c) should minimize impact to riparian areas. Though grazing may delay the recovery of watershed conditions, under conservative use grazing, range and soil conditions should not degrade, but rather remain stable or improve over time. Therefore, indirect effects resulting from upland livestock grazing to migrating southwestern willow flycatchers are anticipated to be insignificant or discountable. No cumulative effects are anticipated for these allotments.

Effects Analysis – Breeding Southwestern Willow Flycatchers

Habitat Effects

Suitable and occupied habitat exists along the Salt River and Tonto Creek. Potential habitat occurs on Rye and Greenback Creeks which flow into Tonto Creek. Surveys in 2005 documented 67 territories, 48 pairs, 58 nests on the Salt River end of Roosevelt Lake, and 84 territories, 63 pairs, 80 nests on Tonto Creek (English et al., 2006).

On the Armer Allotment the lower end of the Lake Pasture is bordered by Roosevelt Lake and, in years when lake levels are low, occupied habitat for the flycatcher occurs just below this allotment in the lake bed, and may be accessible from the Lake Pasture, when this occurs cattle will be prevented from entering potential habitat. In 2004 flycatchers nested in the lake bed just below the Lake Pasture. However in 2005, when lake levels rose, nesting flycatchers were over 2 miles from all pastures of the allotment.

The Del Shay Allotment itself does not contain any suitable or potential habitat for the flycatcher. Suitable and critical habitat does occur directly adjacent to the allotment in Tonto Creek.

The H4 Allotment does not contain any suitable or potential habitat for the flycatcher. Habitat does occur directly adjacent to the allotment in Tonto Creek. Critical habitat occurs on the allotment for approximately one half mile on Slate Creek, just above the confluence with Tonto Creek. However this area does not support any riparian vegetation (see photo Appendix 5) and according to TNF riparian and soils specialist the area is unlikely to develop any riparian vegetation. Slate Creek may be used as a migratory corridor for flycatchers but livestock grazing is not expected to affect the habitat structure of the designated critical habitat on the allotment.

The Hardt Creek Allotment contains potential habitat for the flycatcher along Rye Creek in the Riparian Pasture, this area is excluded from grazing. Suitable and critical habitat for the flycatcher occurs adjacent to the allotment on Tonto Creek. In 2003 two willow flycatchers were heard by TNF personnel on Tonto Creek just downstream from the Seventy-six ranch, approximately a quarter mile from the edge of this allotment. USGS personnel who were banding flycatchers at Roosevelt Lake at the time of the observation conducted a follow up visit, however they could not find the birds and it was never determined if these birds were in fact southwestern willow flycatchers or if they were migrants of another subspecies of willow flycatcher. USGS personnel felt the area contained suitable habitat for the flycatcher.

At the confluence of the Salt River and Roosevelt Lake, immediately adjacent to the Poison Springs/ Sierra Ancha Allotments there is a large patch of occupied flycatcher habitat. Critical habitat occurs directly adjacent to the allotment on the Salt River (Map 33). The portion of Pinto Creek that is within the allotment does not contain suitable or potential habitat (see photos Appendix 5). Lower Coon Creek, where it enters the Salt River on the Lower Dry Creek Pasture contains suitable and potential habitat; this area will not be grazed. Suitable and potential habitat may occur below the West Highway Pasture, in the lake bed, depending on lake levels, grazing in potential habitat will not occur under this proposed action. In 2004 occupied habitat occurred at the lower end of the West Highway Pasture. When lake levels rose in 2005 occupied habitat was no longer accessible from the pasture.

The Schoolhouse Allotment does not contain suitable or potential habitat for the flycatcher, however occupied habitat occurred as close as 2 miles from the edge of the allotment in 2004. When lake levels rose in 2005 occupied habitat was four miles from the edge of the allotment.

There is no suitable or potential habitat on the Seven K Allotment. Flycatchers nest along Tonto Creek as close as one tenth of a mile from the edge of this allotment. Historically some cattle have trespassed from this allotment to the occupied flycatcher habitat in Tonto Creek. Prior to re-stocking the fences between the allotment and the occupied flycatcher habitat will be evaluated and any necessary repairs will be made.

Within the Tonto Basin Allotment the Tonto Creek Riparian Unit contains suitable and occupied habitat. Greenback Creek contains potential habitat. Tonto Creek, in the Tonto Creek Riparian Unit is also designated as critical habitat. Greenback Creek flows through the Bouquet/Cline Mesa and Methodist/Bathtub Pastures. Greenback Creek and the Tonto Creek Riparian Unit will be excluded from grazing under this proposed action. Lambing and Methodist Creeks do contain some riparian areas, however they occur in steep, narrow canyons and the riparian areas are not suitable or potential habitat. When lake levels are low occupied habitat for the flycatcher occurs just below this allotment in the lake bed, and may be accessible from the Lake and Methodist/Bathtub Pastures, when this occurs cattle will be prevented from entering potential habitat.

The Walnut Allotment contains potential and designated critical habitat for the flycatcher in the Lann Pasture, which extends into the Tonto Creek floodplain, this area will not be grazed. The closest nesting territory to the allotment was just over one mile downstream on Tonto Creek in 2005.

Under this proposed action cattle will not be allowed to graze in potential, suitable or occupied habitat on any of the above allotments. Cattle will not have access to the Salt River where potential, suitable and occupied habitat exists, nor will they have access to the bed of Roosevelt Lake as lake levels receed. Therefore direct effects to the flycatcher are avoided on the Armer Mountain, Del Shay, H4, Hardt Creek, Poison Springs/Sierra Ancha, Schoolhouse, Seven K, Tonto Basin, and Walnut Allotments.

Watershed Condition Effects

Inappropriate grazing of uplands can indirecly affect flycatcher habitat in the watershed. Negative impacts of inappropriate grazing include removal of vegetation cover which, in addition to compaction, decreases infiltration of the soil and enhances surface runoff. Increased runoff in turn results in increased silt loads, increased turbidity, decreased water quality, increased scouring during high flows, and altered pH levels. All of these impacts can have an indirect adverse effect to riparian areas, including flycatcher habitat (USFS, 2005, USFWS, 2002c). Livestock grazing can have indirect effects through damage to riparian habitat by denuding the uplands to such an extent that watersheds are in poor condition which results in an increased in severity of flood events leading to riparian habitat destruction.

Due to the long history of grazing on the TNF, it is difficult to ascertain the impacts of the proposed action on riparian areas. Generally the proposed action is expected to increase the amount of riparian habitat (as a result of limited grazing) which is expected to reduce the force of flood flows, reducing impacts to occupied and critical habitat along Tonto Creek and the Salt River. All riparian areas outside of the Salt River or Tonto Creek will be considered critical management areas (not to be confused with critical habitat). Riparian areas will be grazed to ensure that residual vegetation and streambank integrity are maintained to provide for healthy riparian ecosystems. This should provide for improving conditions in the riparian areas.

According to literature summarized by Hanes (1996), Tonto Creek underwent a period of downcutting and incision in 1875. Hanes (1996) cites Luna Leopold in his book A View of the River (1994) stating that the late 1800's are viewed by geomorphologists as a period of "arroyo cutting" throughout the West. The cause is generally attributed to climatic events (drought followed by rain events) and

overgrazing (Hanes 1996). Using the Rosgen classification, Tonto Creek is a "D" or braided channel between Gisela and the slack water of Roosevelt Lake, with the exception of the canyon reach through the Seventy-Six Allotment. "D" type streams can occur both naturally and by evolution from a more stable stream type when changes in stream flow or sediment load are imposed on a stream system. Evolution occurs as the channel attempts to adjust to changes in flow or sediment by widening, straightening, and steepening to transport its sediment load and eventually becoming braided. Braided streams have more than one channel and may change main channels with each high flow. This results in eroding banks, a loss of riparian vegetation, an unstable floodplain, and excess sediment deposited as longitudinal and transverse bars. According to Rosgen (personal communication with J. Grove), braided channels may remain unstable for long periods of time, with little possibility for the stream to restore itself to a stable condition. The existing condition of Tonto Creek is the result of historic watershed changes. It is largely irreversible over the next 50 years, and most directly affected by precipitation and climatic conditions.

Aerial photos show that since 1958 the trend on Tonto Creek has been toward channel widening and instability, which causes smaller, less effective floodplains, less floodplain vegetation and lower density of younger trees. The age-class and spatial patterns of riparian vegetation are highly dynamic, reflecting the unstable stream channel conditions. Change in upland watershed condition is unlikely to affect the existing condition of stream channel and riparian vegetation condition in Tonto Creek. Tonto National Forest hydrologists (Grant Loomis and Lynn Mason), soil scientist (Norm Ambos), and riparian ecologist (Janet Grove) agree (personal communication 2006) with Hanes (1996) that recovery of original watershed conditions is unlikely due to the loss of topsoil and increase in channel density. Because of this, Grove, Loomis, Mason and Ambos also agree that there would be no measurable difference between the effects of no grazing and conservative grazing in the watershed on stream channel and riparian vegetation condition. The lower ends of all the tributaries that drain into the eastern end or Salt River Arm of the Roosevelt Reservoir are also braided washes. These tributaries are laterally unstable, actively eroding, and have high sediment loads. These conditions are likely attributable to the arroyo cutting period initiated after 1875. Reversal of these conditions regardless of management of lands above these tributaries is unlikely. The recruitment and maturation of riparian vegetation along the Salt River Arm is a function of precipitation, floods and water levels.

Because the condition of Tonto Creek and the Salt River is not believed to be influenced by upland conditions at the present time, indirect effects of grazing in uplands on flycatcher habitat are expected to be insignificant or discountable.

Brown-headed Cowbirds

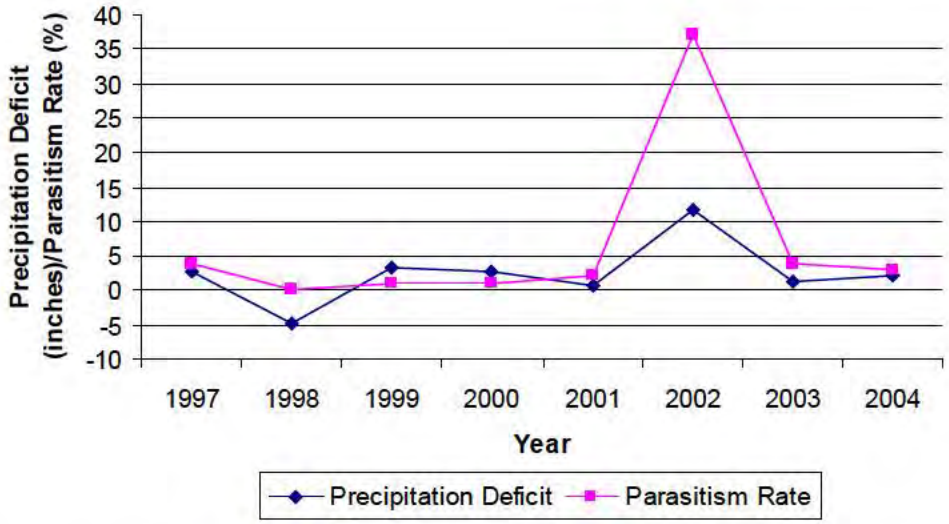
Brown-headed cowbirds are known to parasitize the nests of many species of riparian birds including the flycatcher by laying eggs in their nests (Averill-Murray, 1999; Brown, 1994; Kus, 1999; Whitfield, 1999). This parasitism often results in decreased reproductive success for the individual host because female cowbirds remove host eggs from the nest, nests are abandoned by the host, and cowbird young often out-compete host young for food (Spautz, 1999; Whitfield, 1999; Haltermann, 1999; USFWS, 2002c).

As their name suggests cowbirds participate in a well-known association with cattle (Goguen and Mathews, 1999). However, the effect of cattle on the parasitism rates of flycatchers that breed on Roosevelt Lake has never been determined because no baseline data was collected prior to the onset of cowbird trapping at the lake. The Tonto Basin Ranger District conducted cowbird trapping from 1996-2000 and a permittee contracted trapping in 2001. In 2002 and 2003 cattle were removed from

allotments prior to flycatcher breeding season due to severe drought conditions. The Arizona Game and Fish Department began keeping records of cowbird parasitism rates in 1997. The rates have been 4% or lower for all years except 2002 when the parasitism rate was 37%. 2002 was an extreme drought year, and while the number of flycatchers in the area remained relatively stable, few nested, presumably due to the drought conditions. It is believed the low numbers of nests for flycatchers and presumably other riparian nesting species resulted in a lower number of nests available to be parasitized by the brown-headed cowbird and therefore a higher parasitism rate (Smith et al., 2003; Koronkiewicz et al., 2002). Cowbird parasitism rates appear to be correlated with precipitation deficit for the flycatchers at Roosevelt Lake (Figure 1).

Other activities in the area besides cattle grazing attract brown-headed cowbirds. The areas around Roosevelt Lake, adjacent to the occupied flycatcher habitat are heavily used recreationally for camping and fishing. Several developed and dispersed campsites occur on both the Salt and Tonto arms of Roosevelt Lake within one mile of the occupied habitat. Additionally, there are urban developments close to the flycatcher occupied habitat on both the Salt and Tonto arms of Roosevelt Lake. Commercial developments, campgrounds, housing developments, and a golf course occur as close as one and a quarter miles from the Salt Arm nesting area. On the Tonto Arm of Roosevelt Lake campgrounds, housing and commercial developments are as close as one tenth of a mile from known nesting sites. Cowbirds are often associated with these anthropogenic influences (Rothstein, 1994; USFWS, 2002c).

Figure 1. Relationship between precipitation deficit and brown-headed cowbird parasitism rate.



Some research indicates the effect of cattle on cowbird movements and densities may be undetectable in some areas (Sechrist and Ahlers, 2003; Tisdale-Hein and Knight, 2003). However, other research has shown a direct link between distance to cattle and parasitism rates (Goguen and Mathews, 2000). Radio tracking studies show that cowbirds may commute long distances of 4 miles to over 6 miles between morning breeding ranges and afternoon feeding sites (Rothstein et al., 1984; Thompson, 1994; Curson et al., 2000; Goguen and Mathews, 2001), though most appear to move 2 or less miles a day (Thompson, 1994; Gates and Evens, 1998; Goguen and Mathews, 2001; Sechrist and Ahlers, 2003). Forest Service

grazing guidance criteria has previously suggested that cattle be kept at distances of 5 miles or more from flycatcher occupied habitat during the breeding season where cowbird trapping is not occurring, and 2 miles or more with cowbird trapping (USFS, 2002b). More recent guidance suggests a distance of 2 miles may be sufficient even without cowbird trapping (USFS, 2005a).

In 2005 the Arizona Game and Fish Department continued to monitor nest parasitism rates for the flycatcher, at Roosevelt Lake and cattle grazing occurred 2 to 5 miles from occupied habitat on the Bar V Bar/Campaign Allotment (Table 8). Nest monitoring results give a parasitism rate of 2% at Roosevelt Lake in 2005, with a total of 3 nests containing cowbird eggs out of 138 (English et al., 2006).

The Armer Mountain, Del Shay, H4, Hardt Creek, Poison Springs/Sierra Ancha, Schoolhouse, Seven K, Tonto Basin, and Walnut Allotments will be grazed 2 miles or more from occupied flycatcher habitat during the breeding season. Table 8 shows parasitism rates for each year of monitoring at Roosevelt Lake. Data for 2005 gives a parasitism rate of 2%. Keeping cattle at distances of 2 miles or more from occupied habitat during the breeding season is expected to limit the potential impact of cattle on parasitism rates and therefore parasitism rates due to cattle grazing around Roosevelt Lake are expected to be insignificant and discountable.

Table 7. Locations of cattle relative to occupied flycatcher habitat in 2005

Allotment	Pasture	Number of Cattle 2-5 miles from occupied habitat during the breeding season	Dates (2005)
Schoolhouse	Lake	74	March 16 – May 15
	House	74	May 16 – June 15
	Schoolhouse	74	June 16- August 1
Tonto Basin	Methodist/ Bathtub	30	March 1 – May 31
	Kayler	30	March 1 – May 15
	Mesquite Flat	30	May 16 – Mid June*

* Cattle were removed from this pasture due to the Edge fire

Table 8. Southwestern willow flycatcher survey results at Roosevelt Lake.

Year	# Nests (SWWF)	Parasitism Rate % (BHCO)	Trapping Conducted
2005	138	2	No
2004	154	3	No

Year	# Nests (SWWF)	Parasitism Rate % (BHCO)	Trapping Conducted
2003	140	4	No
2002	43	37	No
2001	113	2	Yes
2000	111	1	Yes
1999	91	1	Yes
1998	58	0	Yes
1997	46	4	Yes
Increases in number of nests from 1997- 1999 is most likely due to increased survey efforts and not an increase in the number of flycatchers using the area			

Critical Habitat

On October 19, 2005, critical habitat was designated in the analysis area (Map 33). Primary constituent elements for the southwestern willow flycatcher are:

1. Riparian habitat in a dynamic, successional, riverine environment for breeding, foraging, migration, dispersal, and shelter for the flycatcher, that could include:

(a) Trees and shrubs that include Goodding willow (*Salix gooddingii*), coyote willow (*S. exigua*), Geyers willow (*S. geyerana*), arroyo willow (*S. lasiolepis*), red willow (*S. laevigata*), yewleaf willow (*S. taxifolia*), pacific willow (*S. lasiandra*), boxelder (*Acer negundo*), tamarisk (*Tamarix ramosissima*), Russian olive, buttonbush (*Cephalanthus occidentalis*), cottonwood (*Populus fremontii*), stinging nettle (*Urtica dioica*), alder (*Alnus rhombifolia, A. oblongifolia, A. tenuifolia*), velvet ash (*Fraxinus velutina*), poison hemlock (*Conium maculatum*), blackberry (*Rubus ursinus*), seep willow (*Baccharis salicifolia, B. glutinosa*), oak(*Quercus agrifolia, Q. chrysolepis*), rose (*Rosa californica, R. arizonica, R. multiflora*), sycamore (*Platinus wrightii*), false indigo (*Amorpha californica*), Pacific poison ivy (*Toxicodendron diversilobum*), grape (*Vitus arizonica*), Virginia creeper (*Parthenocissus quinquefolia*), Siberian elm (*Ulmus pumila*), and walnut (*Juglans hindsii*).

(b) Dense riparian vegetation with thickets of trees and shrubs ranging in height from 2 to 30 m (6 to 98 feet). Lower-stature thickets (2–4 m [6–13 feet] tall) are found at higher elevation riparian forests, and tall-stature thickets are found at middle and lower elevation riparian forests;

(c) Areas of dense riparian foliage at least from the ground level up to approximately 4 m (13 feet) above ground, dense foliage only at the shrub level, or as a low, dense tree canopy; (d) Sites for breeding that contain a dense tree and/or shrub canopy (the amount of cover provided by tree and shrub branches measured from the ground; i.e., a tree or shrub canopy with densities ranging from 50% to 100%); (e) Dense patches of riparian forests that are interspersed with small openings of open water or marsh, or shorter/sparser vegetation that creates a mosaic that is not uniformly dense. Patch size may be as small as 0.1 hectares (ha [0.25 acre]) or as large as 70 ha (175 acres); and

2. A variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, including flying ants, wasps, and bees (Hymenoptera); dragonflies (Odonata); flies (Diptera); true bugs (Hemiptera); beetles (Coleoptera); butterflies/moths and caterpillars (Lepidoptera); and spittlebugs (Homoptera).

Critical habitat occurs on the H4 Allotment for approximately one half mile on Slate Creek, just above the confluence with Tonto Creek. However this area does not support any riparian vegetation (see photo Appendix 5) and according to forest riparian and soils specialist the area is unlikely to develop any riparian vegetation. Slate Creek may be used as a migratory corridor for flycatchers but livestock grazing is not expected to affect the habitat structure of the designated critical habitat on the allotment.

Critical habitat was not designated in the bed of Roosevelt Lake, though this area does contain occupied habitat and is important habitat for the flycatcher. Therefore although the Armer Mountain and Schoolhouse Allotments drain into Roosevelt Lake they do not drain into any critcal habitat and are not expected to effect critical habitat.

All designated critical habitat on the Salt River and Tonto Creek is excluded from grazing, with the exception of Slate Creek on the H4 Allotment. Because critical habitat is excluded, and conservative grazing practices in the uplands are expected to have insignificant and discountable effects on watershed conditions (see discussion above), the project action is not expected to adversely modify critical habitat. As discussed above Slate Creek does not contain any riparian habitat for the portion that was designated as critical habitat and livestock grazing is not expected to affect the habitat structure of the area.

Determination Of Effect – Southwestern Willow Flycatcher

No effect – Bar T Bar, Capitan, Coolidge Parker, Diamond, Jones, Lyons Fork, Radium, Ranger Station, Superior, Sunflower, and Winters allotments.

May effect, not likely to adversely affect – Armer Mountain, Bar X/Haigler Creek/Young, Center Mountain, Crouch Mesa, Del Shay, Devils Canyon, H4, Hardscrabble, Hardt Creek, Haystack Butte, OW, Poison Springs/ Sierra Ancha, Potato Butte, Schoolhouse, Sedow, Seven K, Tonto Basin, Vosburg, and Walnut allotments.

Determination Of Effect – Southwestern Willow Flycatcher designated critical habitat

No effect – Armer Mountain, Bar T Bar, Bar X/Haigler Creek/Young, Capitan, Center Mountain, Coolidge Parker, Crouch Mesa, Devils Canyon, Hardscrabble, Diamond, Haystack Butte, Jones, Lyons Fork, Potato Butte, Radium, Ranger Station, OW, Schoolhouse, Sedow, Superior, Sunflower, Vosburg, and Winters allotments.

May effect, not likely to adversely affect – Del Shay, H4, Hardt Creek, Poison Springs/Sierra Ancha, Seven K, Tonto Basin, and Walnut allotments.

Lesser Long-nosed Bat (*Leptonycteris curasoae yerbabuenae*)

Background

On September 30, 1988, the lesser long-nosed bat was listed as an endangered species under the ESA. Critical habitat has not been designated for the species. A recovery plan for the lesser long-nosed bat

was signed March 4, 1997. According to the Recovery Plan for this species, considerable controversy has developed between members of the scientific community familiar with the lesser long-nosed bat since the listing in 1988. The debate among scientists regarded the actual population size and the listing status for this species (USFWS, 2005a).

The lesser long-nosed bat is a medium-sized bat, about 70-95 mm (2.8-3.8 in) in length. Suitable day roosts and associated concentrations of food plants are crucial for the lesser long-nosed bat (USFWS, 1995b). Caves and mines are used as day roosts. Factors that make roost sites useable have not yet been identified. The species seems sensitive to human disturbance and alternate roost sites may be critical when disturbance occurs. There is potential for routes maintained as part of the grazing management activities to facilitate public access to roosts. Recreationists or others that access active roosts can displace bats, temporarily or permanently.

The lesser long-nosed bat flies long distances from roosts to forage. Night flights from maternity colonies to food have been documented in Arizona at 24 km (15 mi), and in Mexico at 40 km (25 mi) and 61 km (38 mi) one way (Dalton et al*.,* 1994; V. Dalton, Tucson, pers. comm. 1997; Y. Petryszyn, University of Arizona, pers. comm. 1997). A substantial portion of the lesser long-nosed bats at the Pinacate Cave in Sonora fly 40-50 km (25-31 mi) each night to forage in Organ Pipe Cactus National Monument (USFWS, 1995b). Horner et al*.* (1990) found that these bats flew 48-58 km (30-36 mi) round trip between an island maternity roost and the mainland in Sonora; the authors suggested the bats regularly flew at least 80-100 km (50-63 mi) each night.

The lesser long-nosed bat consumes nectar and pollen of paniculate agave flowers and the nectar, pollen, and fruit produced by columnar cacti. The agaves include Palmer's agave (*Agave palmeri*), Parry's agave (*A. parryi*), desert agave (*A. deserti*), and amole (*A. schotti*). Amole is considered to be an incidental food source. The cacti include saguaro (*Carnegiea giganteus*) and organ pipe cactus (*Stenocereus thurberi*). If forage resources are limiting at certain times or places, it is anticipated that numbers of bats may be reduced or bats may have to fly farther from roosts to obtain sufficient resources.

This migratory bat is found throughout its historic range from southern Arizona and extreme southwestern New Mexico through western Mexico and south to El Salvador. In southern Arizona, lesser long-nosed bat roosts have been found from the Picacho Mountains (Pinal County) southwest to the Agua Dulce Mountains (Pima County), southeast to the Chiricahua Mountains (Cochise County), and south to the international boundary. Individuals have been observed from the vicinity of the Pinaleno Mountains (Graham County) and as far north as Phoenix, Glendale, and possibly the McDowell Mountains (Maricopa County). This bat is also known from far southwestern New Mexico in the Animas and Peloncillo Mountains (Hidalgo County). It arrives in Arizona in early April and leaves in mid-September to late October (Cockrum and Petryszyn, 1991; Sidner, 1999). It resides in New Mexico from mid-July to early September (Hoyt et al*.,* 1994).

Lesser long-nosed bat roosts have been documented on the Coronado NF. No records exist on the TNF, but records from the Phoenix area suggest the species occurs at least as a transient on the TNF. What may have been an observation of one lesser-long-nosed bat of undetermined sex was made in July 1992 in a mine in the McDowell Mountains 10 miles from the western boundary of the Tonto.

More comprehensive reviews of lesser long-nosed bat life history, status, conservation, and range can be found in USFWS (1995b, 2005).

Status In Action Area

No records exist for lesser long-nosed bat on the Forest. The nearest confirmed records are from the Phoenix area and the possible McDowell Mountains record, the former record was 20-30 miles west and the later approximately 10 miles west of the TNF. The Phoenix records are of immature females, August 30 (Phoenix) and September 16 (Glendale), while the McDowell Mountains record was an undetermined sex on July 26. The records are all late in the season, which suggests the bats were transients. The nearest known roost is in the Picacho Mountains, which is greater than 40 miles south-southeast from the action area.

Effects Analysis

The Framework outlines that one of the following criteria must be met for making "no effect" determinations for lesser long-nosed bats:

1. Lesser long-nosed bats are not present within the action area,

2. Within the range of the species, livestock grazing will not result in exposure to the species, and thus, no response.

In order to make a "may affect, not likely to adversely affect" determination, the Framework requires that each of the following criteria be met:

1. Livestock grazing occurs in the action area and roost sites in the action area will be protected from disturbance or modification,
2. Construction of range improvements will not damage or destroy more than 1% of bat food plants within 0.5 miles of the project site (e.g., fences, stock tanks, etc.),
3. Within the range of the bat, and in the action area, livestock management will not destroy more than 1% of the agave flowering bolts during the flowering period to allow bolts to reach a height where livestock grazing on agaves is unlikely to occur. The flowering period may vary, but April 1 through June 15 can be used as a guide.
4. Within the range of the bat, in saguaro communities and in the action area, (as contained in desert scrub vegetation types), annual livestock grazing utilization will be maintained at conservative levels (see definitions). (Holecheck 1988).

Records from the Phoenix area and the McDowell Mountains suggest the species occurs as at least a transient on the Forest (USFWS, 2002a). Although lesser long-nosed bats have not been found on the Forest, no comprehensive roost surveys for this species have been conducted. However, surveys for bats in various mines throughout the TNF have not yielded lesser long-nosed bats.

Potential foraging habitats do exist on the TNF, in the form of saguaro and agave stands. Saguaros flower in May and fruits mature in June and July. Lesser long-nosed bats feed on both the nectar and fruits of saguaros. When saguaro fruits are scarce or unavailable in late July or early August, agave nectar is the primary food resource for lesser long-nosed bats. Agaves typically bolt or flower and provide a nectar resource for foraging bats from about April 15 into October, depending on the agave. Palmer's agave, the most important agave for lesser long-nosed bats in southeastern Arizona, begins to bolt in May, and typically flowers from July through early October (USFWS, 2002a).

It is not reasonably certain that lesser long-nosed bats do not occur on the TNF. However, no known regularly occupied roost sites are located within 40 miles of the TNF, which is the reported distance bats forage from a roost.

No direct effects are anticipated as a result of the proposed action. The action could have adverse effects on food resources for the bat through direct grazing or trampling of preferred nectar sources on allotments where suitable foraging habitat is present. However, the fact that only 3 records exist in the vicinity of the TNF and these are likely transient bats, indirect effects to foraging resources are likely insignificant and discountable. No cumulative effects are expected.

Determination Of Effect – Lesser Long-nosed Bat

No effect – Armer Mountain, Bar X/Haigler Creek/Young, Capitan, Center Mountain, Coolidge Parker, Crouch Mesa, Devils Canyon, Hardscrabble, Haystack Butte, Jones, Lyons Fork, OW, Poison Springs/Sierra Ancha, Potato Butte, Radium, Ranger Station, Sedow, Seven K, Superior, Vosburg, Bar T Bar, Del Shay, Diamond, H4, Hardt Creek, Schoolhouse, Tonto Basin, Sunflower, Walnut, and Winter's Ranch Allotments.

Gila Topminnow (*Poeciliopsis occidentalis occidentalis)*

Background

The Gila topminnow was listed as endangered in 1967 without critical habitat. The species was later revised to include two subspecies, *P. o. occidentalis* and *P. o. sonoriensis*. Both subspecies are protected under the ESA. Only Gila topminnow populations in the United States, and not in Mexico, are listed under the ESA. The original recovery plan for the Gila and Yaqui topminnows was completed on March 15, 1984. This recovery plan calls for the down listing or delisting of both species. Criteria for down listing were met for a short period. However, due to concerns regarding the status of several populations, down listing was delayed. Subsequently, the number of reintroduced populations dropped below that required for down listing, where it has remained (USFWS, 2005a).

Gila topminnow is a small member of the livebearer family, Poeciliidae. Males seldom exceed one inch in length and females two inches. Coloration is tan to olive on the body and usually white on the belly. Scales on the dorsum are darkly outlined, and the fin rays are outlined with melanophores, although lacking in dark spots. Breeding males are impressively blackened. Gonopodium of male reaches past snout when in copulatory position. Gila topminnow is similar in appearance to western mosquitofish (*Gambusia affinis*) (Minckley, 1973).

Habitat requirements of Gila 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 43-99º F (Minckley 1973). 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. Gila topminnow also live in a fairly wide range of water chemistries, with recorded pH's from 6.6 to 8.9, dissolved oxygen readings from 2.2 to 11 ppm, and salinities from tap water to sea water. Gila topminnow food habits are generalized and include bottom debris, vegetative materials, amphipod crustaceans and insect larvae, including mosquitoes. The mode of reproduction in Gila topminnow is internal fertilization of the eggs with internal development of the young. The young are born alive. Onset of breeding and brood size are affected by water temperature, photoperiod, food availability, and predation. In constant warm temperature springs, breeding takes place year-round, whereas in fluctuating habitats, breeding occurs from April to August. Brood size

varies from 1 to 20 young, and two broods are carried simultaneously by the female, one much further developed than the other. Gestation period is 24 to 28 days. Topminnow life span is approximately one year.

Gila topminnow was historically widespread and abundant in the Gila River drainage. It was described as "one of the commonest fish in the southern part of the Colorado River drainage..." in the early 1940's, and was found throughout the Gila River system up to about 4,500 feet elevation. Locally, Gila topminnow were reported from the Salt River at Roosevelt, and in Tonto Creek in 1904. Today, Gila topminnow is eliminated from all riverine habitats and remains in only eight natural sites (two on public lands) and in a varying number of transplanted sites.

The decline in Gila topminnow range and numbers can be attirbuted to two vectors: habitat loss loss and the introduction of nonnative. Aquatic habitats that once supported topminnow have been altered by dams, irrigation canals, dredging, and draining of wetlands. Groundwater extraction has lowered aquaifers thus dessicating surface waters that once contained Gila topminnow.

Since 1878 more than 60 nonnative fishes have been imported into Arizona for various purposes. Many of these prey on topminnow and other native fishes and also compete for resources such as food and space. In 1926, the western mosquitofish was introduced into Arizona from the southeastern US, and has since spread rapidly throughout the southwest. Western mosquitofish occupies the same habitat as Gila topminnow, thus it came into direct contact with Gila topminnow, and its aggressive, predatory nature led to sudden declines in the populations of Gila topminnow. Western mosquitofish directly prey on juvenile Gila topminnow, and harass and bite the fins of the adults, which often results in infection and death of the individual. Because both species are livebearers, there is no competition for spawning sites. Food habits of the two species are different with Gila topminnow mainly browsing on detritus and vegetation, and the mosquitofish feeding mainly on invertebrates and small fish. The role of western mosquitofish in the decline of Gila topminnow has been well-documented, which in many cases has been very rapid. Several flourishing populations of Gila topminnow were completely eliminated within two years after introduction of western mosquitofish. In general, the two species do not coexist, particularly in habitats that are not subject to flooding, or where habitat complexity is low. When the habitat is sufficiently large and complex, the two species can apparently maintain some segregation and coexistence can occur, in some instances, over a long period of time. The mechanism by which the balance between them is maintained in these particular instances is poorly understood, but appears related to periodic flooding, habitat complexity, the presence of springhead refuges, and perhaps water chemistry. In Sonoita Creek and upper Santa Cruz River, coexisting topminnow and mosquitofish tended to segregate, with mosquitofish in quieter water and topminnow occupying moderate currents associated with shore, logs, or debris.

Protection of native populations is important in preventing extinction of Gila topminnow. Management activities that affected water quality, quantity, or riparian conditions caused local disappearance of populations. Resource uses, such as grazing, mining, irrigation, timber, recreation, roads and public access can be hazardous to the existence of Gila topminnow populations and their habitats. Conflicting opinions by resource managers on the effects of such uses on aquatic habitats often hinder protection of the species. Full consideration of the effects of land uses on the habitat at occupied sites is necessary to ensure continued vitality of the populations. In addition, all efforts must be made to protect natural sites from invasion by western mosquitofish.

A secondary effort involves expanding the number of occupied sites in order to buffer the effects of

continuing loss of populations. Transplants of Gila topminnow were done in 1964 and 1975 in attempts to establish new populations of this depleted native fish. Fifty-six sites, including four on TNF, were stocked during this period. In 1981, the USFS, AGFD, and USFWS entered into a Memorandum of Understanding for the purpose of enhancing the recovery of Gila topminnow by reintroducing it into ponds, springs, and streams within the historic range. The agencies agreed that downlisting of the species would be initiated when 20 populations had survived over at least a three-year period, and delisting could be initiated when 30 populations had survived for at least five years. Since 1982, 136 sites on State, private and Federal lands in southern Arizona have been stocked with Gila topminnow, with the majority of stockings occurring in 1982.

Potential reintroduction sites were chosen based on a habitat capability profile developed for Gila topminnow. Parameters of the profile included cover, food availability, and water depth, temperature, quality, and velocity. Ponds and stock tanks, spring streams, and perennial and intermittent streams were considered the most viable sites for reintroduction. In 1982, Gila topminnow were stocked into 40 sites on TNF, and in 1983, an additional 15 sites were stocked. Other than two sites on private land inholdings stocked in 1985, no other reintroductions have since been made on the TNF.

The fate of the reintroduced populations has not been that successful. Most sites disappeared due to desiccation, but flooding, invasion by western mosquitofish, dredging, and vandalism have also had an effect on topminnow. Although the criteria for downlisting of the species was briefly met during 1987 and 1989, the number of sites persisting longer than three years dropped to 19 by 1991, including 11 on the TNF. During 1992, an additional three populations on the TNF failed.

Today, the TNF contains 10 out of the 13 populations of Gila topminnow that exist on National Forest System lands in Arizona. Stocked sites include Charlebois, Cottonwood Artesian, Hidden Water, Mud, Walnut, Kayler and Dutchman Grave springs; Campaign and Lime Creeks; and Unnamed Drainage #68B on the TNF. Nearly all other occupied Gila topminnow sites' watersheds contain or closely adjoin National Forest System lands (i.e. Larry Creek and Lousy Canyon downstream from the Tonto NF.) (USFWS, 2005a).

The description, legal status, distribution and abundance, habitat, life history, population dynamics, status in action area that overlaps these allotments or is near by, and the factors affecting the Gila topminnow are published in several publications: Gila topminnow recovery plan (USFWS, 1998a), Heritage Data Management System (AGFD), BO for maintenance of Walnut Spring and Cross F term grazing permit (USFWS, 2004c), BO for Southwest Region of the Forest Service for Ongoing Livestock Grazing Activities (USFWS, 1999), BO for ongoing grazing (USFWS, 2002a), and the programmatic biological opinion for the Forest Plans of the southwestern region (USFWS, 2005a). The environmental baseline discussions contained in these publications are still current and are referenced as the baseline for this assessment. The conservation measures included in the programmatic BO have been reviewed and incorporated where appropriate.

The two most recent BOs for the TNF covering Gila topminnow covered activities at Mud and Hidden Water Springs (Sunflower Allotment – dredging of Mud Spring ponds, repatriation of topminnow and desert pupfish *Cyrinodon macularius*) and Walnut Spring (Cross F Allotment - spring maintenance, reestablishment of desert pupfish, continued use of a 10-year term permit to graze livestock on the surrounding Cross F Allotment, and other activities (USFWS, 2004c). The proposed action on Walnut Spring is expected to improve the condition under which Walnut Spring's Gila topminnow population has flourished for over 20 years and thus, contribute incrementally to recovery and maintain water for grazing livestock

Status In Action Area

A Gila topminnow population at Kayler Spring is located adjacent to the Del Shay (Map 10) and Tonto Basin Allotments (Table 29). Occupied topminnow sites occur at Mud Spring (Dos S Unit) and Hidden Water Spring (Cottonwood Unit) of the Sunflower Allotment. These sites are outside of the project area and are covered under previous consultations.

In the early 1980's, AGFD stocked topminnow in many locations on the TNF; the majority of these introduced fish did not persist. Several of these sites located on allotments within the action area include Armer Mountain (Map 2), H4 (Map 13), Hardt Creek (Map 15), Schoolhouse (Map 24), Sedow (Map 25), and Tonto Basin (Map 29). Extensive survey work has been conducted for Gila topminnow on the Tonto NF and no populations are known to occur on the other allotments covered in this consultation.

Table 9. Location of Gila Topminnow Populations and Occupied Habitat

Allotment Name	Occupied Habitat
Del Shay/Tonto Basin Allotment	Kayler Spring, occupied site located immediately adjacent to both allotments. Fenced out to exclude livestock. Not included in any grazing allotment or the Tonto Creek Riparian Unit.
Sunflower	Mud Spring and Hidden Water Spring are located Sunflower Allotment on the Dos S and Cottonwood Units which are not in this consultation.

Effects Analysis

The Framework outlines that one of the following criteria must be met for making "no effect" determinations for Gila topminnow:

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.

The Framework states the following criteria must be met for a not likely to adversely affect determination for the Gila topminnow:

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

The main impacts from cattle are the grazing of plants and trampling of vegetation and soil. These impacts can affect both riparian zones and uplands. With enough cattle use the water can be depleted and impair water quality. Livestock grazing likely has effects to individual topminnow and it affects the viability of topminnow populations through siltation and possible failure of any type of structure currently constructed to impound water (USFWS, 2004c). It has been observed, however, that cattle can contribute to the maintenance of some aquatic environments. By clearing waters of emergent vegetation and maintaining the early serial aquatic stage of man-made stock tanks or man-made water source cattle often maintain open water of sufficient depth for Gila topminnow. This determination needs to be evaluated on a case by case basis. Grazing could indirectly impact watershed conditions surrounding occupied topminnow sites. Recent visits to these allotments suggest that current range condition and trend data does not reflect current conditions. Thus, accurate baseline environmental conditions are not known. Though grazing may delay the recovery of watershed conditions, under conservative use grazing, range and soil conditions should not degrade, but rather remain stable or improve over time. Therefore, indirect effects resulting from upland livestock grazing to Gila topminnow are not likely to reach the level where take would occur, thus these indirect effects are insignificant or discountable to Gila topminnow. No cumulative effects are anticipated for these allotments.

Kayler Spring

Kayler Spring contains a population of Gila topminnow; however this spring is outside of the allotments included in this consultation. Kayler Spring is located between the Windmill Pasture of the Del Shay Allotment, the Kayler Pasture of the Tonto Basin Allotment (Map 29), and the Tonto Creek Riparian Unit and is fenced to exclude livestock. The fence surrounding Kayler Spring will be inspected and repaired prior to entry of livestock to either the Windmill Pasture (Del Shay Allotment) or Kayler Pasture (Tonto Basin Allotment). Topminnows along with non-native mosquito fish and crawfish were found in 2003 (AGFD, 2003). Due to the year-round exclusion of livestock from the occupied topminnow sites there are no direct effects from the proposed action to the topminnow.

For the reasons listed above, indirect effects to the Kayler Spring topminnow population as a result of upland grazing are determined to be insignificant or discountable. Additionally, the lower pastures (including Windmill) are grazed in the late winter and spring when there are winter annuals. When winter annuals are prevalent livestock use on perennials and shrubs will be negligible. No cumulative effects are anticipated.

Determination of Effect – Gila Topminnow

No effect – Armer Mountain, Bar X/Haigler Creek/Young, Bar T Bar, Capitan, Center Mountain, Coolidge Parker, Crouch Mesa, Devils Canyon, Diamond, Sunflower, H4, Hardt Creek, Hardscrabble, Haystack Butte, Jones, Lyons Fork, OW, Poison Springs/Sierra Ancha, Potato Butte, Radium, Ranger Station, Sedow, Schoolhouse, Seven K, Superior, Vosburg, Walnut, and Winter's Ranch Allotments

May affect, not likely to adversely affect – Del Shay and Tonto Basin Allotments

Gila Chub (*Gila intermedia*)

Background

On November 2, 2005, the USFWS published a final rule listing the Gila chub as endangered and designating 160 miles of streams in Arizona and New Mexico as critical habitat (USFWS, 2005c). The

designation identifies the stream habitats that are believed essential to help recover the species.

Gila chub is a member of the minnow family (Cyprinidae) that can achieve lengths up to 10 inches. Its body is chunky with large scales. Overall coloration is dark, sometimes lighter on the belly. Breeding males have red or orange on the lower cheeks, posterior parts of the lips, paired fin bases, and on the lower sides of the body. Breeding colors of the males seem more intense than in other Arizona chubs, culminating in the entire ventro-lateral surface becoming fire-red, and the eye becoming yellow to yellow-orange. Gila chub typically occupies pools in small streams, marshes, cienegas, and other quiet waters, although it may have occurred in larger, more complex habitats. It is highly secretive, remaining in deeper waters near cover (Minckley, 1973; AGFD, 1999). Foods include both terrestrial and aquatic invertebrates, small fishes, algae, and organic debris. Breeding in streams seems to be sporadic throughout the spring and summer, while in constant temperature springs breeding lasts through late winter, spring, and summer months, and perhaps into early autumn. Breeding occurs over beds of aquatic plants. Females achieve lengths of 10 inches; males rarely grow longer than 6 inches.

In Arizona, Gila chub was widely distributed in isolated habitats, occurring in the headwaters of essentially all the major tributaries to the Gila River, including the Verde, Agua Fria, Aravaipa, San Pedro, and Santa Cruz drainages (USFWS, 1998b). It has recently been rediscovered in the San Pedro drainage in Sonora, Mexico, where it had not been collected since 1857. On the TNF, it occurs in Silver Creek and occurs in watered reaches of Mineral Creek which is adjacent to the TNF; it was extirpated from Cave Creek and Seven Springs Wash during fish renovation efforts in the early 1970's.

Threats to the species arise from several sources. Gila chub is becoming rare, especially where land use practices such as overgrazing lead to incision of floodplains and lowering of water tables, which, in turn, drain marshlands and other stream-associated habitats. Efforts to maintain and restore cienega type habitats are needed to ensure the survival of the species. Populations of Gila chub have been quickly eliminated following stocking of largemouth bass into their habitat. The spread of nonnative fish in waters in Arizona continues to be disastrous for the native fish fauna of the state. Reintroduction of Gila chub into suitable habitats is an appropriate management action.

Status In Action Area

Gila chub previously occurred in the watered reaches of Mineral Creek downstream of the TNF boundary. Recent surveys by AGFD have not found Gila chub (pers. comm., Cori Corvath). The upstream reaches of Mineral Creek occurring on the TNF are currently dewatered. The Lyon's Fork Allotment (Map 18) contains critical habitat for the Gila chub, however none are present. There is a 1979 record for Gila chub in the state heritage layer in Tonto Creek on the Hardt Creek Allotment (Map 15). This record is not considered valid since it was prior to the splitting of Gila from headwater chub and due to the location, the record is likely a headwater chub (D. Weedman, pers. comm.).

Effects Analysis

The Framework states that the following criteria must be met for making a "may affect, not likely to adversely affect" for Gila chub:

1. The species or critical habitat is not present in he 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.

The Framework states the following criteria must be met for a "not likely to adversely affect determination" for the Gila chub:

1. Evidence suggests that there is reason to believe Gila chub may be present in the action area,
2. Direct effects to Gila chub will be avoided by yearlong exclusion of livestock from occupied TEP species habitats in the action area,
3. Indirect effects to Gila chub which result from upland livestock grazing are determined to be insignificant or discountable.

Gila chub do not currently occur within the action area due to stream reaches of Mineral Creek on the Tonto NF being dewatered and the fact that no Gila chub are currently present in the watered sections of Mineral Creek. Therefore, there are no direct effects to Gila chub.

Indirect effects to Gila chub could occur in Mineral Creek downstream of the TNF boundary if Gila chub repatriated the area. Riparian vegetation removal could elevate stream temperatures and increases in sedimentation could possibly cause problems with recruitment of Gila chub into the population or cause a decrease in the production of macroinvertebrates which Gila chub feed upon (Tellman et al., 1997; Pearce et al., 1998). Current range condition and trend data is not known for these allotments, so baseline environmental conditions are not known. Though grazing may delay the recovery of watershed conditions, under conservative use grazing, range and soil conditions should not degrade, but rather remain stable or improve over time. Therefore, indirect effects resulting from upland livestock grazing to Gila chub are not likely to reach the level where take would occur, thus these indirect effects are insignificant or discountable to Gila chub or its critical habitat. No cumulative effects are anticipated for these allotments.

Gila chub critical habitat has been designated for Mineral Creek and improper cattle grazing could have direct effects on this habitat. Removal of riparian vegetation and breaking of banks would degrade this habitat for chubs once the reach was rewatered. Under conservative use grazing and the TNF riparian guidelines (USFS, 2002), these activities should be negligible. As mentioned above, watershed effects could occur, however we feel these indirect effects will be insignificant or discountable. No cumulative effects to critical habitat are anticipated.

Determination Of Effect – Gila Chub

No effect – Armer Mountain, Bar X/Haigler Creek/Young, Bar T Bar, Diamond, H4, Hardt Creek, Tonto Basin, Walnut, Capitan, Center Mountain, Coolidge Parker, Crouch Mesa, Devils Canyon, Hardscrabble, Haystack Butte, Jones, OW, Poison Springs/Sierra Ancha, Potato Butte, Radium, Ranger Station, Sedow, Schoolhouse, Seven K, Superior, Vosburg, Winter's Ranch, Del Shay, and Sunflower Allotments

May affect, not likely to adversely affect – Lyons Fork Allotment

Determination Of Effect – Gila Chub designated critical habitat

May affect, not likely to adversely affect – critical habitat on the Lyons Fork Allotment

Razorback Sucker *(Xyrauchen texanus)*

Background

The razorback sucker was listed as endangered in 1991 with critical habitat designated in 1994. Designated critical habitat for the Salt and Verde Rivers that flow through the TNF consists of the Salt River and its 100-year floodplain from the old U.S. Highway 60/State Route 77 bridge to Roosevelt Diversion Dam (Gila County) and the Verde River and its 100-year floodplain from Perkinsville to Horseshoe Dam, including Horseshoe Lake to the full pool elevation (Yavapai County). The Coconino, Prescott, and Tonto NF manage 63.3 miles of the Verde River for razorback sucker. In addition the Tonto NF manages 66.2 miles of the Salt River for occupation of razorback suckers (USFS, 2004a). The upper Verde and Salt Rivers and their tributaries are vital to the continued existence of razorback suckers (USFWS, 2002d).

Razorback sucker is one of the larger members of the sucker family (Catostomidae), reaching lengths to 24 inches and weights over 6 pounds (Minckley, 1973). Adult fish are relatively robust. Its most noticeable feature is a sharp-edged keel that develops behind the head in adults. Coloration is dark olivaceous on the back and keel, fading to yellowish white on the abdomen. Males become dark brown to black on the back and develop a russet- to orange-colored lateral band and yellow belly. Coarse, sharp tubercles, whose function is hold the female during the spawning act, develop on the anal, caudal, and pelvic fins, and on the caudal peduncle. Females that have spawned repeatedly may be scarred and abraded from contacts with males and with rocky bottoms.

Diet of razorback sucker consists of midge larvae, planktonic crustaceans, diatoms, filamentous algae, and detritus. Razorbacks feed mostly from the bottom, but have elongated, "fuzzy" gillrakers and subterminal mouth both characteristic of planktonic or detrital feeding habits.

Both sexes mature as early as 4 years. Spawning occurs from late winter to early summer along shorelines or in bays at water depths of 1 to 20 feet and water temperatures of 52 to 68º F over sand and gravel substrates. No nest is built nor is parental care given. Each female produces about 75,000 to 144,000 eggs, which drift to the bottom and hatch there. Larvae and juveniles suffer very high mortality from predation, particularly from introduced species. After their seventh year of life, annual growth is less than 0.4 inches per year. Longevity is upwards of 50 years. A remnant population of large adults in Lake Mohave spawns from late January through April over gravelly bottoms in relatively shallow water. Despite successful reproduction, there has been no evidence for successful recruitment of young fish into the population for more than two decades. Most individuals in the Lake Mohave population are over 40 years old.

The razorback sucker was once abundant throughout the Colorado River basin, primarily in the mainstem and major tributaries in the southwestern United States and northwestern Mexico. A significant commercial fishery for it existed in Saguaro Lake in 1949, but it has not appeared in collections since about that time. It disappeared from Roosevelt Lake just before the 1930's, but persisted in the Verde River basin, in Peck's Lake near Clarkdale, at least until 1954. Information on habitat of razorback sucker is limited. Except for spawning migrations, razorback suckers are fairly sedentary, moving relatively few miles over several months. They tend to occupy strong, uniform currents over sandy bottoms, eddies and backwaters lateral to the river channels, and sometimes

concentrating in deep places near cut banks or fallen trees. During spawning season, razorback suckers are found in runs with coarse sand, gravel, and cobble substrate, flooded bottomlands, gravel pits, and large eddies formed by flooded mouths of tributary streams and drainage ditches. In the Green River during non-breeding season, the fish are found in depths of 2 to 11 feet over sand or silt substrates, with water velocities of 0.3 to 2.0 feet per second. During summer months use shifts to relatively shallow waters off mid-channel sandbars. Habitat needs of young and juvenile razorback suckers in the wild are largely unknown because they are rarely encountered by researchers. Larval razorback suckers in Lake Mohave remain near shore after hatching but either disappear or migrate to depths in excess of 50 feet within a few weeks. Juveniles are most often collected from irrigation canals in Arizona and California. Substantial numbers of razorback suckers were reared through the juvenile and adult stages in hatcheries and in isolated ponds.

Since 1910, 15 dams have been constructed on the lower Colorado River and its major tributaries, the Gila, Verde, and Salt rivers. These dams dewatered, cooled, or impounded most of the lower basin system so that little natural riverine habitat exists today. Thus, the few remaining unaltered rivers (e.g., upper Verde and Salt rivers and their tributaries) are vital to the continued existence of razorback sucker. About 40 non-native species are established in the Colorado River, and more will probably be introduced in the future. Alteration of historic flow regimes and construction of reservoirs has created favorable conditions for these fishes, many of which are major predators on razorback sucker.

In an effort to recover the species many millions of hatchery-produced larval razorback suckers were stocked into the mainstem and tributaries of the Salt, Verde, Gila and lower Colorado rivers during the past decade. Unfortunately, recaptures from these stocking efforts were scarce. Now stocking of larger individuals is being conducted in an effort to increase probability of survival in the prescence of predation. Monitoring is difficult given the large reintroduction area and its geography. There are indications that populations are being established in isolated habitats and in the uppermost reservoirs of the drainages being stocked. Razorback suckers have successfully reproduced in isolated backwaters where predators were not present; growth to 8 inches was recorded before predators reinvaded the site. It appears that survival of razorback sucker is largely dependent on its reestablishment in areas where predators are absent and individuals can grow to adult size.

At present, the largest remaining population exists in Lake Mohave, and smaller populations exist in the Green River and the upper Colorado River subbasin. No significant recruitment to any population has been documented in recent years.

On the TNF, razorback sucker have been stocked into the Verde and Salt Rivers, and several of their larger tributaries. Critical habitat on the TNF includes all of the Verde River north of Horseshoe Dam and on the upper Salt River upstream from Roosevelt Lake. Four allotments in this consultation are within designated critical habitat.

The description, legal status, distribution, abundance, habitat, life history, population dynamics, and status in the action area that overlaps these allotments or is near by, and the factors affecting the razorback sucker are published in several publications: Razorback sucker recovery plan (USFWS, 2002d), Heritage Data Management System (AGFD), BO for Southwest Region of the Forest Service for Ongoing Livestock Grazing Activities (USFWS, 1999), BO for on-going grazing on the Tonto NF (USFWS, 2002d), BO for Eleven Land and Resource Management Plans (USFWS, 2005a), BA for Eleven Land and Resource Management Plans (USFS, 2004a) and BA for Hicks-Pikes Peak Allotment (USFS, 2005e).

The USFWS concurred that grazing is not likely to adversely affect the razorback sucker based on activities (including grazing) controlled by the TNF Plan (USFWS, 2005a) and based on grazing on the Hicks-Pikes Peak Allotment, an adjacent allotment along the upper Salt River (USFWS, 2005b).

Status In Action Area

Razorback sucker occur in reaches of the Salt River that flow through Chrysotile, Haystack Butte, Poison Springs, and Sedow allotments. River miles presumed occupied are listed in (Table 10).

Table 10. Allotments containing razorback sucker critical habitat and associated river mileage.

Allotment Name	Habitat
Haystack Butte (Globe RD)	Upper Salt River (4.25 miles)
Poison Springs (Tonto Basin RD)	Upper Salt River (9 miles)
Sedow (Globe RD)	Upper Salt River (7.8 miles)

Effects Analysis

The Framework states that the following criteria must be met for making a "no affect" for razorback sucker:

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.

The Framework states the following criteria must be met for a "may affect, not likely to adversely affect" determination for the razorback sucker:

1. Evidence suggests that there is reason to believe razorback sucker may be present in the action area,
2. Direct effects to razorback sucker will be avoided by yearlong exclusion of livestock from occupied TEP species habitats in the action area,
3. Indirect effects to razorback sucker which result from upland livestock grazing are determined to be insignificant or discountable.

Water quality in currently and historically occupied reaches is partially influenced by grazing management in the uplands. While water quality is a limiting factor, it is not considered a threat to recovery in the lower Colorado Basin. The two main limiting factors (and the related actions outlined in the Recovery Goals) for the recovery of razorback sucker relate to change in flow regime by impoundments and introductions of non-native fish. These two limiting factors are not directly related to management on the Tonto NF. More or less, these limiting factors are "inherited" as part of the historical management of these river systems by other agencies and private landowners. The Forest Service has made efforts to acquire water rights to improve the flow regime on the Verde River as well as monitor non-native fish populations (in partnership with University of Arizona, AGFD, and Rocky

Mountain Research Station) in relation to the razorback sucker (USFS, 2004a).

The re-introduction razorback sucker in the upper Salt River was considered a failure (Hendrickson, 1993). Monitoring following reintroduction has shown many species of non-native fish but no razorback suckers in the upper Salt River. In three years of surveys only one razorback sucker was recovered in Roosevelt Lake (Jahrke and Clark, 1999). At the start of reintroduction efforts, flathead catfish made up less than 5% of the species sampled. Surveys through 1999 now show that flathead catfish make up 80% of the fish collected from the Horseshoe Bend to the Highway 288-bridge of the Salt River (USFS, 2005e). Even though the razorback sucker is thought to be extirpated from the upper Salt River there may be a few individuals that still persist and the river is still considered critical habitat.

The Haystack Butte (Map 16), Poison Springs (Map 20), and Sedow Allotments (Map 25) have the Salt River as part of their boundary. The length of river that is part of each allotment is shown in Table 8. For all four allotments, livestock are excluded from the river by fences or by natural barriers; therefore, no direct effects are anticipated as a result of grazing. Grazing could indirectly impact the Salt River watershed. Current range condition and trend data is not known for these allotments, but due to reduced stocking over the past 5 years has resulted in improved rangeland and watershed conditions. Though grazing may delay the recovery of watershed conditions, under conservative use grazing, range and soil conditions should not degrade, but rather remain stable or improve over time. Therefore, indirect effects resulting from upland livestock grazing to razorback sucker are not likely to reach the level where take would occur, thus these indirect effects are insignificant or discountable to razorback sucker or its critical habitat. No cumulative effects are anticipated for these allotments.

Razorback suckers are not known to occur nor is there habitat for razorback sucker on the other allotments in this BA.

Determination Of Effect – Razorback Sucker

No effect – Armer Mountain, Bar X/Haigler Creek/Young, Bar T Bar, Diamond, H4, Hardt Creek, Tonto Basin, Walnut, Capitan, Center Mountain, Coolidge Parker, Crouch Mesa, Devils Canyon, Hardscrabble, Jones, Lyons Fork, OW, Potato Butte, Radium, Ranger Station, Seven K, Schoolhouse, Superior, Vosburg, Winter's Ranch, Del Shay, and Sunflower Allotments

May affect, not likely to adversely affect – Haystack Butte, Poison Springs/Sierra Ancha, and Sedow Allotments

Determination Of Effect – Razorback Sucker designated critical habitat

May affect, not likely to adversely affect – Haystack Butte, Poison Springs/Sierra Ancha, and Sedow Allotments

Spikedace (*Meda fulgida)*

Background

Spikedace was listed as threatened in 1986 with critical habitat designated in 1991. Currently no critical habitat is designated on the TNF. Spikedace do not presently occur on TNF, although the Salt and Verde

Rivers and Tonto Creek are historical collection sites.

The spikedace is a sleek, stream-dwelling member of the minnow family (Cyprinidae), that seldom exceeds 3 inches in length (Minckley, 1973). Its body is slender, almost spindle-shaped, and slightly compressed laterally. Scales are present only as small plates deeply embedded in the skin. It has two spinous rays at the leading edge of the dorsal fin, the first being obviously the strongest, sharp-pointed, and nearly as long as the second. The eyes and mouth are both large, the mouth is terminal and barbels are absent. There are seven rays in the dorsal fin, and usually nine in the anal fin. The caudal fin is deeply forked. Coloration is bright silvery on the sides of the body, with vertically-elongated, black specks. The back is olive-gray to brownish, and usually is mottled with darker pigment. The underside is white. Males in breeding condition become brightly golden or brassy, especially on the head and at the fin bases.

Adult spikedace occupy midwater habitats of runs, pools, and swirling eddies that are typically less than one foot deep with velocities of 1 to 2 feet per second (Rinne, 1991; 1999) . Adults often aggregate in shear zones along gravel-sand bars, quiet eddies on the downstream edge of riffles, and broad, shallow areas above gravel-sand bars. Larval spikedace most commonly occupy slow-velocity waters near stream margins over sand-dominated substrates. In winter, spikedace appear to seek out protected areas, either cobble streambanks or slow-velocity areas in the lee of gravel bars. Spawning occurs in shallow sand and gravel-bottomed riffles. Physical cover in the form of instream or overhead objects does not appear to be a factor in the habitat requirements of the species.

Distribution and abundance of spikedace has been severely reduced by habitat destruction due to damming, channel alteration and downcutting, riparian degradation, water diversion and groundwater pumping (Rinne, 1999). Introduction and spread of exotic predatory and competitive fishes also contributed to its decline. Resource activities that affect water quality, such as removal of riparian vegetation, sedimentation, or control of water levels, can affect spikedace habitat quality, and should be avoided or corrected.

The spikedace was common and locally abundant throughout the upper Gila River basin of Arizona and New Mexico (Rinne, 1999). Its distribution was widespread in large and moderate-sized rivers and streams in Arizona, including the Gila, Salt, and Verde rivers and their major tributaries upstream of present day Phoenix, and the Agua Fria, San Pedro, and San Francisco river systems. Spikedace now is restricted to less than six percent of the historic range. In Arizona it occurs in Aravaipa and Eagle Creeks, and the Verde River upstream of Tapco.

Status In Action Area

Of the thirty-six allotments covered in this BA, only Hardt Creek had critical habitat previously designated. This critical habitat was located on about 0.5 miles of Rye Creek. Currently, no critical habitat is designated for this species in the Hardt Creek Allotment, nor is the species present on any allotment.

Effects Analysis

The Framework states that the following criteria must be met for making a “may affect, not likely to adversely affect” for spikedace:

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.

Since the spikedace is not present within the action area, no direct, indirect, or cumulative affects are anticipated.

Detemination of Effect – Spikedace

No affect – Armer Mountain, Bar X/Haigler Creek/Young, Bar T Bar, Chrysotile, Haystack Butte, Poison Springs/Sierra Ancha, Sedow, Diamond, H4, Hardt Creek, Tonto Basin, Walnut, Capitan, Center Mountain, Coolidge Parker, Crouch Mesa, Devils Canyon, Hardscrabble, Jones, Lyons Fork, OW, Potato Butte, Radium, Ranger Station, Seven K, Schoolhouse, Superior, Vosburg, Winter's Ranch, Del Shay, and Sunflower Allotments

Loach Minnow (*Tiaroga cobitus)*

Background

Loach minnow was listed as threatened in 1986 and critical habitat was designated in 1999. Loach minnow does not currently occur on TNF, and there are no historical records of occurrence.

Loach minnow is a stream-dwelling member of the minnow family (Cyprinidae; Minckley, 1973). Its body is elongated, little compressed, and flattened ventrally, and seldom exceeds three inches in length. The mouth is small, terminal, and highly oblique; there are no barbels. The eyes are markedly upward directed. Coloration of the body is an olivaceous background, highly blotched with darker pigment. Whitish spots are present at the origin and insertion of the dorsal fin, and dorsal and ventral portions of the caudal fin base. Breeding males have bright red-orange coloration at the bases of the paired fins and on the adjacent body, on the base of the caudal lobe, about the mouth, near the upper portion of the gill openings , and often on the abdomen. Females in breeding become yellowish on the fins and lower body.

Loach minnow inhabit turbulent, rocky riffles of mainstream rivers and tributaries up to about 7,200 feet elevation (Rinne, 1992). It is restricted almost exclusively to a bottom-dwelling habit, swimming above the substrate for only brief moments as it darts from place to place. Adult loach minnow are typically found in water flowing 2 to 2.5 feet per second and 6 to 7 inches deep where they occupy the interstices of cobble-size substrate (these habitats occasionally have dense growths of filamentous algae). Larval and juvenile loach minnow are usually found in shallower, slower water over sand substrate.

Loach minnow are opportunistic, benthic insectivores, largely deriving their food supplies from among riffle-dwelling, larval mayflies, blackflies and midges. Loach minnow appear to actively seek their food among bottom substrates, rather than pursuing animals entrained in the stream drift.

Spawning of loach minnow occurs in spring (March to June) when maximum daily water temperatures exceed 60º F (Rinne, 1992). Adhesive eggs are deposited on the underside of flattened cobble-size rocks in the same riffles occupied by adults during the remainder of the year. The nest is guarded by the male, and possibly the female as well. Fecundity of individual females is 150 to 250 mature ova about 1/16-inch in diameter. Eggs incubate for five to six days. At hatching, larval loach minnow are less than 1/4-inch long. At one year, loach minnow are about 2.5 inches, and attain a maximum length of about three inches at two years. Longevity of most individuals is 15 to 24 months, although some may survive

36 months.

Loach minnow was once locally common throughout much of the Gila River system, including mainstem and tributaries of the Verde, Salt, San Pedro, San Francisco and Gila rivers, and the East, Middle and West forks of the upper Gila River up to about 7,200 feet elevation. Its present range of occurrence represents about 15% of the former range, and includes the upper Gila River and its three forks, the San Francisco River and Aravaipa Creek.

Activities that affect water quality, such as removal of riparian cover, sedimentation, or control of water levels, can affect loach minnow habitat quality. Dams and reservoirs appear to eliminate loach minnow for many miles upstream and downstream. Spread of exotic predators, especially flathead catfish and channel catfish, can also directly reduce loach minnow populations.

Status In Action Area

Of the thirty grazing allotments covered in this document, only Hardt Creek had critical habitat previously designated. This critical habitat was located on about 0.5 miles of Rye Creek. Currently, no CH is designated for this species in the Hardt Creek Allotment, nor is this species present on any allotment in this consultation.

Effects Analysis

The Framework states that the following criteria must be met for making a "may affect, not likely to adversely affect" for loach minnow:

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.

Since the loachminnow is not present within the action area, no direct, indirect, or cumulative affects are anticipated.

Detemination of Effect – Loachminnow

No affect – Armer Mountain, Bar X/Haigler Creek/Young, Bar T Bar, Chrysotile, Haystack Butte, Poison Springs/Sierra Ancha, Sedow, Diamond, H4, Hardt Creek, Tonto Basin, Walnut, Capitan, Center Mountain, Coolidge Parker, Crouch Mesa, Devils Canyon, Hardscrabble, Jones, Lyons Fork, OW, Potato Butte, Radium, Ranger Station, Seven K, Schoolhouse, Superior, Vosburg, Winter's Ranch, Del Shay, and Sunflower Allotments

Arizona Hedgehog Cactus (*Echinocereus triglochidiatus var. arizonicus*)

Background

The Arizona hedgehog cactus was listed as endangered on October 25, 1979, without critical habitat

designation. No recovery plan has been established for the cactus. The Arizona Native Plant Law protects Arizona cacti and the species is also protected from international trade by the Convention International Trade in Endangered Species of Wild Fauna and Flora (USFWS, 2005a).

The Arizona hedgehog cactus is a large succulent perennial. Mature stems average 8-10 cm in diameter. Young plants have a single stem and mature plants can have up to 10 stems. There are 1-3 gray or pinkish central spines, the largest deflexed, and 5-11 shorter radial spines per spine cluster. Flowers are bright red, produced along the side of the stem, and appear in April through mid-May.

This species is extremely difficult to distinguish from other closely related species. Current taxonomic work will define the populations in the Miami-Superior area as belonging to this species, and all other cacti from around the Safford area as belonging to an unlisted species (Baker, pers. comm., 2001). This will make the plants on the Apache-Sitgreaves NFs a species other than Arizona hedgehog cactus.

This cactus occurs in the Interior Chaparral community at elevations of 1,000-1,400 m. They are often found on relatively open, rocky slopes and steep fissured cliffs, although they may occur in fairly dense chaparral. They seem to be associated with Schultze Granite and Apache Leap Tuff, both igneous in origin (USFS, 1996). The species is known from Pinal and Gila counties on the Tonto NF and possibly private lands. There is limited information on the status of the cactus on the Tonto NF. Surveys conducted on the Tonto NF in conjunction with the Carlota Mine Project detected 1,150 plants (USFS, 2004a). These surveys determined a recruitment ratio of 1.65 new recruits to each loss showing that the population was both healthy and increasing during the 1992-1994 surveys (USFS, 1996). Threats to the plant include trampling by livestock and mining activities.

Further description, legal status, distribution and abundance, habitat, life history, population dynamics, status in action area that overlaps these allotments or is near by, and the factors affecting the Arizona hedgehog cactus are published in several publications: Heritage Data Management System (AGFD), BA for noxious weeds (USFS, 2004b), BO for on-going grazing (USFWS, 2002a), BA for Pinaladera Fuels Project (USFS, 2005c), and the programmatic biological and opinion for the Forest Plan (USFWS, 2005a). The environmental baseline discussions contained in these publications are still current and are referenced as the baseline for this assessment. The conservation measures included in the programmatic BO have been reviewed and incorporated where appropriate.

Status In The Action Area

The areas where Arizona hedgehog cactus is thought to occur are listed in Table 11.

Table 11. Locations where Arizona hedgehog cactus is thought to occur.

Allotment Name	Pasture Names	General Location
Superior	Montana Mountain, Wild Horse (possible)	Superior to Miami Area
Devils Canyon (Consultation	North Upper Southeast, Recreation, Southwest, Lower	Superior to Miami Area

completed under existing BO).	Southeast	
Lyons Fork	Mine, Black Rock, Middle, Bobtail, State Lands	Superior to Miami Area
Ranger Station	Northwest, Southeast, Hayes, Mountain	South of Globe
Coolidge Parker	CCC	South of Globe
Capitan	Maverick, Harvey	South of Globe
Winters	Apache	North of Globe
Radium	Upper Nugget, Berry, Wood Road, Whiteman Ridge	North of Globe

Effects Of The Action

The Framework outlines that one of the following criteria must be met for making a "no effect" determination on Arizona hedgehog cactus:

1. Listed or proposed plants or critical habitat is not present within the action area.
2. No indirect effects will occur from livestock grazing within the action area.

In order to make a "may affect, not likely to adversely affect" determination, the Framework requires that each of the following criteria be met:

1. Livestock grazing is managed in such a way that livestock herbivory to individual listed plants is not expected.
2. Livestock grazing is managed in such a way that trampling of individual listed plants is not expected.
3. The suitability and sustainability of listed plant habitat will not be adversely altered by livestock grazing.
4. Listed plants will not be physically damaged by livestock management activities.

No individuals or habitat for the species are known to occur on the Armer Mountain, Bar T Bar, Bar X/Haigler Creek/Young, Center Mountain, Crouch Mesa, Del Shay, Diamond, H4, Hardscrabble, Hardt Creek, Haystack Butte, Jones, OW, Poison Springs/Sierra Ancha, Potato Butte, Seven K, Sunflower, Tonto Basin, Vosburg, and Walnut Allotments, therefore no direct, indirect, or cumulative effects are expected for the Arizona hedgehog cactus.

Arizona hedgehog cactus occurs on the Superior Allotment (Map 28) in the Montana Mountain Pasture (T&E Species Forest GIS Layer). The hedgehog cactus is known to grow between 3,300 and 5,700 feet in elevation. The east side of Wild Horse Pasture is above 3,300 feet. The hedgehog cactus is not known to occur here but there have been no surveys so we cannot eliminate the possibility that it occurs. The Montana Mountain Pasture is the northern most pasture adjacent on the east side to the North Pasture of the Devils Canyon Allotment and to the Brushiest Allotment on the north side, both known to contain hedgehog cactus. This pasture is steep and rugged terrain typical of the habitat where this cactus

primarily grows. Most of the pasture is between 3,000 and 5,000 ft elevation. Plants on this allotment have been observed to occur on steep rugged terrain unlikely to be accessible to livestock (Craig Woods, District Biologist). Exact locations are not all known and how much of the substrate where this cactus can be found that is accessible to livestock is not known but it is estimated that due to the roughness of the terrain plants are not vulnerable to herbivory and/or trampling.

The USFWS concluded that the grazing action is not likely to jeopardize the existence of the Arizona hedgehog cactus on the Devils Canyon Allotment because only a small portion of the cacti are accessible to livestock (AESO/SE 2-21-99-F-300, USFWS 2002a). The current proposed action is similar to the one proposed in 2002 therefore, no further analysis will completed for Devils Canyon Allotment (Map 11).

Lyons Fork Allotment is located east of Devils Canyon and south of Ranger Station and Coolidge Parker Allotments (Map 18). Every pasture is within the elevational range where the hedgehog cactus may be found: Mine, Black Rock, Middle, Bobtail, and State Land Pastures. The northern portions of Bobtail and Middle Pastures exceed the upper elevational level (5,700 feet elevation) for this species. There are a few small holding pastures in addition to these. The nearest known population is in the Five Point Pasture of the Bellevue Allotment northwest of the Mine Pasture. There are no records in the Forest GIS layer however; the Arizona hedgehog cactus has been seen on the allotment (Craig Woods, pers. comm.). The area has not been surveyed so the exact locations are unknown. Pastures containing habitat are not so steep that would preclude individual plants from being vulnerable to herbivory and/or trampling.

Ranger Station Allotment occurs immediately to the west of Coolidge Parker Allotment. There are no records in the Forest GIS layer; however the Arizona hedgehog cactus has been seen on the allotment (Craig Woods, pers. comm.). The area has not been surveyed; therefore the exact locations are unknown. The allotment contains four pastures. The Northwest, Southeast, and Hayes Pastures are all between 3,300 and 5,700 feet elevation where the hedgehog cactus may occur. The majority of the Mountain Pasture is above the elevation where the cactus may occur with the exception of the very northern part. Pastures containing habitat are not so steep that they would preclude individual plants from being vulnerable to herbivory and/or trampling.

Arizona hedgehog cactus occurs within the Coolidge Parker Allotment in the CCC Pasture (HDMS GIS layer; Map 8) along the Sixshooter Canyon Trail. Other pastures within the plant's elevational range are: Harvey, East Harvey, West Harvey, Home, 66, Exchange, and Antive. It is not known if the hedgehog cactus occurs in other pastures. The CCC as well as other pastures within the elevational range where the cactus is known to occur contains habitat where the steepness of the terrain will not preclude individual plants from being vulnerable to herbivory and/or trampling.

It is not known if the Arizona hedgehog cactus occurs on the Capitan Allotment (surveys are needed). Coolidge Parker which is known to have this cactus and the Maverick and Harvey Pastures of the Capitan Allotment contain similar habitats at similar elevations.

The Sedow Allotment is in the vicinity of Apache Peaks where the cactus is known to occur. Therefore, the occurrence on these allotments cannot be ruled out. Similar to Coolidge Parker, the steepness of the terrain will not preclude individual plants from being vulnerable to herbivory and/or trampling.

Arizona hedgehog cactus occurs in Apache Pasture of the Winters Allotment (Map 32) that is part of the Apache Peaks (T&E occurrence Forest GIS layer). The adjacent Yankee Joe Pasture is also part of the Apache Peaks but occurrence of the cactus is not known. Both of these pastures are in steep and rugged

terrain typical of the habitat where this cactus primarily grows. Exact locations are not all known and amount of substrate where this cactus can be found that is accessible to livestock is not known but it is estimated that due to the roughness of the terrain that plants are not vulnerable to herbivory and/or trampling.

It is not known if the Arizona hedgehog cactus occurs on Radium Allotment (Map 22). The allotment is immediately to the south of Winter Allotment where the Arizona hedgehog cactus is known to occur. The adjacent pastures to Winter's Apache Pasture are Upper Nugget, Berry, Wood Road, and Whiteman Ridge Pastures. All pastures are steep and rugged terrain typical of the habitat where this cactus primarily grows. Exact locations are not all known and amount of substrate where this cactus can be found that is accessible to livestock is not known but it is estimated that due to the roughness of the terrain that plants are not vulnerable to herbivory and/or trampling.

Arizona hedgehog cactus was reported on the Chrysotile Allotment for Timber and Carol Pastures which contain the headwaters for Ash Creek (T&E occurrence Forest GIS layer). Plants resembling Arizona hedgehog cactus were observed adjacent to Ash Creek downstream from Timber Camp. Coordination with Mima Falk of the USFWS Tucson Office, determined that these plants were not Arizona hedgehog cactus. It was determined that the hedgehog cactus was not present in the action area which included both the Timber and Carol Pastures (USFS 2005d).

The major direct impact to the species associated with the proposed action is physical damage from livestock trampling. These cacti tend to grow in circumstances unfavorable for passage or grazing activity by cattle, due to steepness of slope and the fact that specimens are usually within bedrock cracks and crevices. Only those few individuals that grow within a soil matrix (less than 3 percent of the population) on slopes less than 60 percent are at risk of physical damage from livestock. Cedar Creek Associates, Inc. (1994) reported observations of physical damage to individual cacti due to cattle occurred at an estimated rate of approximately one trampled cactus specimen in 400 to 500 observations. These observations occurred throughout the range of the species during seasons when cattle were present at allowable stocking rates. Observations occurred only in those topographic circumstances which allow grazing by cattle regardless of underlying substrate. Potential effects of grazing on Arizona hedgehog cactus have been assessed on the Devil's Canyon Allotment. In a plot of over 100 plants accessible to livestock, no trampling was noted (Craig Woods, pers. comm.). Even if trampled, the hedgehog cactus has demonstrated the ability to recover. A single, two-year-old specimen that was observed to have been crushed by javelina during early spring, showed very good signs of recovery during two later visits in the summer and fall of the same year, and was fully recovered the following year (USFWS, 2002a). Thus, direct effects of the proposed action by trampling are possible, but not likely where the cactus occurs in the project area. Indirect effects are possible if population viability were impacted by trampling of plants. This is unlikely since the instances of trampling by livestock are extremely low, less than 0.25% in the case of the Cedar Creek Associates, Inc. (1994) observations. Cumulative effects are not expected.

Determination Of Effect – Arizona Hedgehog Cactus

No effect – Armer Mountain, Bar T Bar, Bar X/Haigler Creek/Young, Center Mountain, Crouch Mesa, Del Shay, Diamond, H4, Hardscrabble, Hardt Creek, Haystack Butte, Jones, OW, Poison Springs/Sierra Ancha, Potato Butte, Schoolhouse, Seven K, Sunflower, Tonto Basin, Vosburg, and Walnut Allotments

May affect, not likely to adversely affect – Superior, Devils Canyon, Winters, Radium, Chrysotile, Lyons Fork, Ranger Station, Coolidge Parker, Sedow, and Capitan Allotments

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Appendices

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 decisionmaking 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 decisionmaking 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 decisionmaking 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. Bald eagle breeding data, 1996 through 2006.

	YEAR											
BREEDING AREA	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2004**	**2005**	**2006**
SEVENTY SIX	S1	S2	S2	S1	S2	S2	O	O	F	F	U	F
SHEEP	S2	O	O	S1	F	F	S2	F	S1	F	S2	O
TONTO	S2	S2	S1	S2	F	S1	S2	F	S2	S2	S1	S2
CANYON	O	O	O	O	O	U	U	U	U	U	U	U
CIBECUE	O	O	O	S1	O	O	F	F	F	F	F	S1
REDMOND	F	F	S1	F	S1	S1	F	O	S1	S1	O	F
PINAL	F	F	O	O	F	U	S1	F	S1	S1	S2	F
PINTO	S3	F	O	S2	O	S2	F	O	S2	S2	S2	S1
TOTAL FLEDGLINGS	8	4	4	7	3	6	5		7	6	7	4

[1]U = Unoccupied, O = Occupied, S = Successful (n=eagles fledged), F = Failed, FOS = Fostered, (n=+X, -X are eaglets taken or fostered)

Appendix 3. Mexican spotted owl breeding data, 1996 through 2005.

		Year									
PAC Name	Number	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Pleasant Valley R.D.:											
Colcord	120501	IM-NR	O-NU	M		M	M	IM-NR	O-2Y		
Bear Springs	120502	IM-NR	O-NU	P		IM-NR	IM-NR	IM-NR	IM-NR	NR	
Reservation	120504	P				M		IM-NR	IM-NR	M	
Turkey Peak NE	120505	O-NN	O-NN	O-NU	IM-NR	P	IM-NR	IM-NR	O-NU		O-NU
Turkey Peak NW	120506	A	A	A	IM-NR	IM-NR		IM-NR	IM-NR		NR
Turkey Peak SW	120507		IM-NR			IM-NR		O-NU	IM-NR		NR
Valentine-Lower	120508		IM-NR	O-NU		IM-NR		IM-NR	IM-NR	NR	
Rose	120511							IM-NR	IM-NR	NR	
Canyon-Lower	120512							IM-NR	IM-NR	NR	
Lion	120513							IM-NR	IM-NR	NR	
Lost Salt	120515	IM-NR	O-NN	O-NU	O-3Y	O-NU	O-NU	O-NU	O-NU		
Parallel Canyon	120516		IM-NR				IM-NR	IM-NR			
Bear Head Canyon	120517	O-NU	O-2Y		O-2Y						
Reynolds Creek	120519					P					
Center Mountain	120520										
Center Mountain	120520										
Devil's Chasm	120521										
Cienega Spring	120522										
Copper Mountain	120525	IM-NR		P						O-2Y	
Cold Water Canyon	120527										
Pueblo Canyon	120528										
Coon Creek	120529					IM-NR					
Cold Springs	120530										
Colcord Canyon	120531	P		O-NU		P		IM-NR	IM-NR		
Chamberlain	120532	P		O-NU		M		IM-NR	IM-NR		
Globe R.D.:											
Ferndell Spring	120201	P				P			O-NN	O-NU	
Pioneer Pass	120202	P			M	P			A		
Mill Creek	120203					P-NN			O-NU	O-NU	
Madera Peak N	120205	P			M				M	O-NU	
Ash Creek	120206										
Icehouse Canyon	120207	O-NU			O-1Y	M			M		

Frio Spring	120208								O-1Y	O-NU	
Sulfide del Rey	120209									O-NU	
Tonto Basin R.D.:											
Buck Basin	120601										
Deer Creek	120603		O-NN	O-NU	M	IM-NR		M			
Mount Ord	120604	P	O-NU	O-NU	O-NU	O-Y		M			
Pigeon Springs	120605		IM-NR	O-NU	O-2Y	O-NU		P	O-NN		
Y Bar Basin	120606										
Maple Draw	120607		O-NU	O-NU	O			IM-NR	O-NN		

LEGEND

O= Pair Occupancy inferred or confirmed

M= Male inferred or confirmed

F= Female inferred or confirmed

P= Presence of a single owl inferred or confirmed, sex unknown

Y= Number of young fledged

YD= Number of young found dead

NU= Nesting status undetermined

NY= Nesting status undetermined, no young produced

NN= Non-nesting/Non-reproduction confirmed

NA= Nest Abandoned

NF= Nest Failed

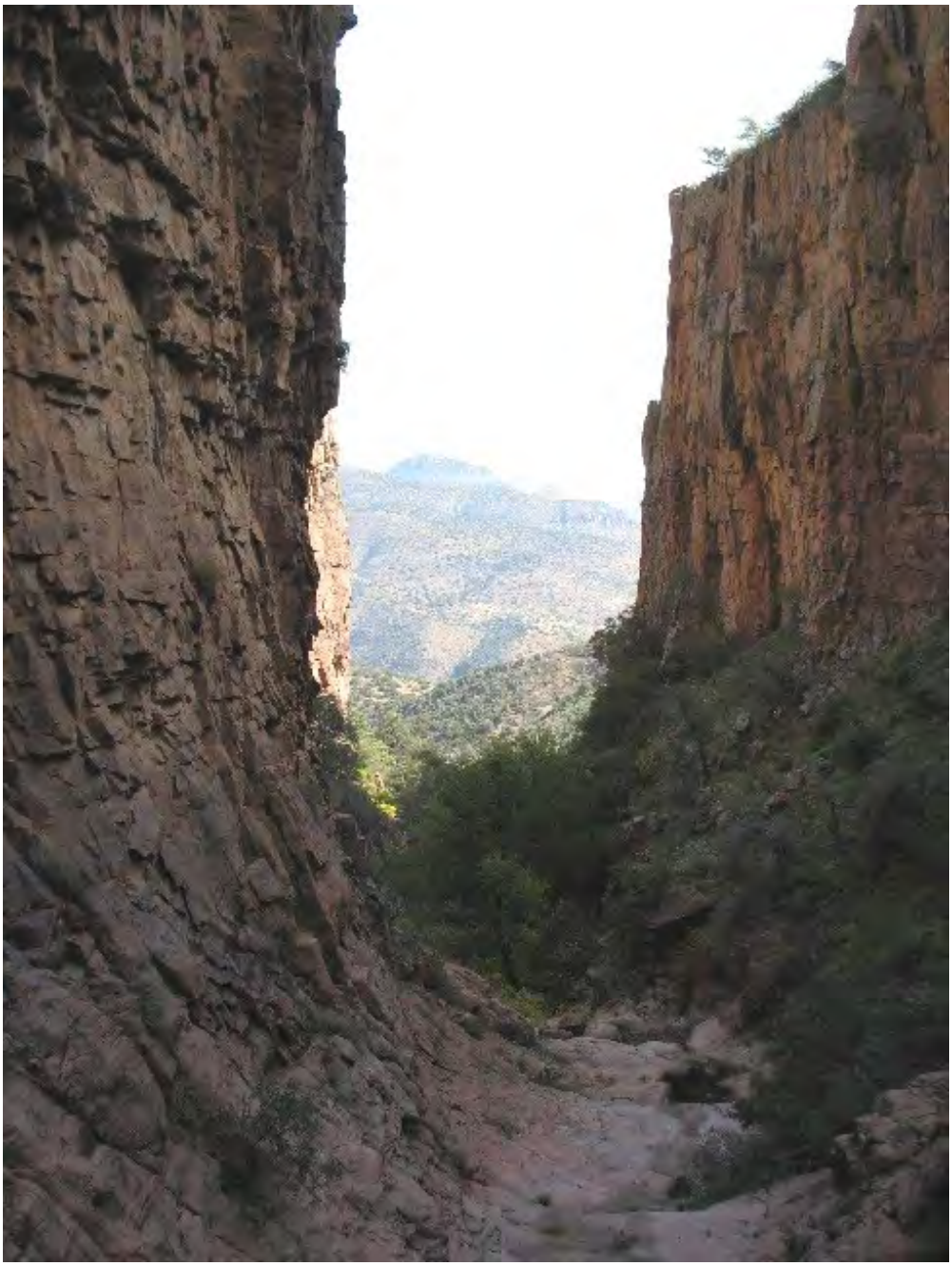
A= Absence or Unoccupied

IM= Informally monitored

NR= No response or location

Appendix 4. Photos from Mexican spotted owl protected activity centers.

Cliff walls in the Devil's Chasm PAC.



Steep slopes within the Cold Water Canyon PAC.

Steep slopes within the Pueblo Canyon PAC.

Appendix 5. Photos from southwestern willow flycatcher critical habitat.

Pinto Creek on the Poison Springs Allotment.

Pinto Creek on the Poison Springs Allotment, cont.

Slate Creek on the H-4 Allotment, where critical habitat is designated.

Appendix 6. Tonto National Forest 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.

Conclusion of Drought: 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.