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AESO/SE
02-21-01-F-0425 April 30, 2003

Mr. Rodger Zanotto
Acting Forest Supervisor
Coconino National Forest
Supervisor's Office
2323 East Greenlaw Lane
Flagstaff, Arizona 86004-1810

RE: Buck Springs Range Management Allotment Plan

Dear Mr. Zanotto:

This document constitutes the U.S. Fish and Wildlife Service's biological opinion based on our review of the proposed reauthorization of livestock grazing on the Buck Springs Range Allotment, Mogollon Rim Ranger District, Coconino National Forest, Coconino County, Arizona, as described under Alternative G of the Buck Springs Range Analysis Draft Environmental Impact Statement. This biological opinion analyzes the effects of the allotment management plan on the threatened Little Colorado spinedace (*Lepidomeda vittata*) and its critical habitat, the threatened Mexican spotted owl (*Strix occidentalis lucida*) (MSO), and the threatened Chiricahua leopard frog (*Rana chiricahuensis*) in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). We received your initial December 20, 2001, request for formal consultation on December 21, 2001.

On July 23, 2001, we received your letter dated July 18, 2001, requesting informal consultation for possible effects from implementing the proposed Buck Springs Range Allotment Management Plan (AMP) on the Little Colorado spinedace and its critical habitat, the MSO, the southwestern willow flycatcher (*Empidonax traillii extimus*), and the bald eagle (*Haliaeetus leucocephalus*). Your determinations included a "no effect" for the bald eagle, and "may affect, not likely to adversely affect" for the other species and critical habitat. You also requested a conference opinion for the Chiricahua leopard frog pursuant to regulations at 50 CFR 402.10(d), and made a determination that the proposed action would not likely jeopardize its continued existence. Based on ensuing discussions, you revised your determinations for the spinedace, its critical habitat, and the MSO to "may affect, likely to adversely affect," and requested formal consultation on the two species and spinedace critical habitat. The Chiricahua leopard frog was listed on July 13, 2002 (USDI 2002). On October , 2002, the Forest Service requested formal consultation for effects resulting from the allotment management plan.

In your December 20, 2001, letter, you requested our concurrence that the proposed action "may affect, but will not likely adversely affect" the southwestern willow flycatcher. We concur with your determination. The basis for our concurrence is found in Appendix A. You also requested our concurrence with a "no effect" determination for the bald eagle. We provided concurrence with your "no effect" determination in our December 28, 2001, letter acknowledging your initiation of formal consultation.

This biological opinion is based on the information provided in the July 18, 2001, biological assessment and evaluation (BAE); the July, 2001, draft environmental impact statement; the December 20, 2001, amendment to the BAE; the September 26, 2002, second amendment to the BAE; the October 7, 2002 amendment to the BAE; telephone conversations, meetings, and electronic mail transmissions with your staff; field investigations conducted by Fish and Wildlife Service personnel; and other sources of information. A complete administrative record of this consultation is on file at this office.

Consultation History

Details of the consultation history are summarized in Table 1.

Table 1. Summary of Consultation History

Date	*Event*
1992	The Coconino National Forest began discussions with the Fish and Wildlife Service about ongoing operations and management of the Buck Springs Allotment in regard to the Little Colorado spinedace.
August 14, 1996	We prepared a draft jeopardy biological opinion (2-21-92-F-503) on the effects of the use of the Buck Springs, Hackberry-Pivot Rock, and Bar-T-Bar Allotments through 2004 on the Little Colorado spinedace. This opinion was never finalized because the proposed action was changed.
March 8, 1997	The Coconino National Forest met with the Fish and Wildlife Service and requested that the project under consultation be modified to cover only the 1997 livestock grazing season.
May 6, 1997	We issued a non-jeopardy/non-adverse modification biological opinion for on-going livestock grazing on the Buck Springs Allotment and portions of the Hackberry/Pivot Rock and Bar-T-Bar Allotments for the 1997 livestock grazing season.

February 2, 1999	Buck Springs Allotment included in the "Southwest Region, U.S. Forest Service, Ongoing Grazing Activities on Allotments Biological Opinion" (Region 2/ES-SE 000089RO). This consultation period covered grazing operations on the allotment for three years (1998, 1999, 2000).
April 21, 1999	We amended the Ongoing Grazing Biological Opinion for the Buck Springs Allotment. The amendment described project modifications, modified stocking rates and allowable utilization levels; included two replacement Terms and Conditions; and removed one Term and Condition from the 1999 Biological Opinion.
May 11, 2001	We amended the Ongoing Grazing Biological Opinion to extend the consultation period to include the 2001 grazing season.
July 23, 2001	The Forest Service requested informal consultation on the effects of implementing the Buck Springs Range AMP.
November 19, 2001	We advised the Forest Service that formal consultation and conferencing is appropriate.
December 21, 2001	The Forest Service requested formal consultation on the effects of implementing the Buck Springs Range AMP on the MSO and the Little Colorado spinedace.
May 14, 2002	We requested an extension of the consultation period and amended the Ongoing Grazing Biological Opinion to extend the consultation period to cover livestock grazing activities through June 15, 2002.
June 13, 2002	The Chiricahua leopard frog is listed as threatened under the Endangered Species Act.
July 15, 2002	We provided a draft biological opinion to the Forest Service.
August 6, 2002	We received the Forest Service's draft comments for the draft biological opinion.
August 16, 2002	We received a letter dated August 12, 2002, from the allotment permittee providing comments on the draft biological opinion.
August 23, 2002	We met with the Forest Service to discuss their comments.
August 29, 2002	We met with the Forest Service and the permittee to discuss changes to the proposed action and comments on the draft biological opinion.
October 4, 2002	The Forest Service initiated formal consultation on the effects of the implementing the Buck Springs Range AMP on the Chiricahua leopard frog and amended the proposed action.

February 24, 2003	We provided a second draft biological opinion for the Forest Service.
April 21, 2003	We met with the Forest Service and the permittee to discuss the second draft biological opinion.
April 23, 2003	We received the Forest Service's comments on the second draft biological opinion.
April 24, 2003	The Forest Service sent us a copy of the permittee's April 19, 2003, comments on the proposed action and the draft biological opinion. Also included was the permittee's letter of support for supplemental stocking of Little Colorado spinedace into Miller, General Springs, and Bear canyons.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Buck Springs Range allotment is located on the Mogollon Rim Ranger District, Coconino National Forest, Coconino County, Arizona. The allotment includes approximately 70,800 acres of Forest Service lands primarily within the East Clear Creek watershed southeast of State Highway 87, and mostly south of East Clear Creek. The eastern boundary lies along Leonard Canyon and the Apache-Sitgreaves National Forest. The southern boundary is the Mogollon Rim and the Tonto National Forest, and the western boundary separates the Blue Ridge and Long Valley Ranger Districts of the Coconino National Forest.

The action area for this project is defined as all areas affected directly or indirectly by the Federal action. Thus, the action area is larger than the boundaries of the proposed project because impacts may be carried downstream with flows and may also affect upstream areas. Watersheds and subwatersheds are comprised of numerous interconnected upland and riparian areas that function together as an ecological unit. For the proposed project, the action area includes the East Clear Creek mainstem from five miles upstream of the Jones Crossing area and downstream 25 miles from the confluence of East Clear Creek and Yeager Canyon. The action area also includes Leonard Canyon and 25 miles downstream from the intersection of Leonard Canyon and the southeast corner of North Pasture. Included within this action area are all perennial and non-perennial tributaries of East Clear Creek, and the uplands that drain into these tributaries and East Clear Creek.

The Mogollon Rim Ranger District proposes to implement Alternative G of the Buck Springs Range Management Environmental Impact Statement for reauthorizing livestock grazing on the Buck Springs Range allotment. The life of the permit would be ten years (through 2012).

The proposed AMP would restrict livestock grazing to the pastures that lie primarily in the northern portion of the allotment. The grazed pastures would be grouped into a west management unit (Battleground Unit) and an east management unit (Buck Springs Unit).

Livestock would graze each of the two management units one year in two. Included within the Battleground Unit are North Jumbo, South Jumbo, McCarty, North Battleground, North Pinchot, Burn, South Pinchot (northern portion), and South Battleground pastures. The Buck Springs Unit includes the North, North McClintock, Horse, Dines, North Knolls (north of Buck Springs Canyon), and Moonshine pastures. Pastures in the southeast portion of the allotment will be excluded from livestock grazing (Knolls, North Buck Springs, South Buck Springs, South McClintock, and Aspen Horse pastures, and the southern portion of South Pinchot Pasture). The North McClintock Pasture was added to the list of pastures available for grazing on October 4, 2002.

The new ten-year grazing permit is for up to 373 cow/calf pairs (equivalent to 532 yearlings) and eight horses on the Battleground Unit and a maximum of 243 cow/calf pairs (equivalent to 347 yearlings) and eight horses on the Buck Springs Unit from May 15 through October 15. The number of livestock permitted to graze any given year will be based on the management unit to be grazed and pasture availability for the respective management unit. Pasture availability will be dependent upon successful implementation of the scheduled range structural improvements (fences). Fences critical to the AMP will be constructed prior to livestock grazing and the permittee is required to maintain all fences both before and during the grazing season. Livestock grazing across several riparian reaches will occur (Miller Canyon, General Springs Canyon, Bear Canyon, Dick Hart Draw, Houston Draw, Barbershop Canyon, and Yeager Canyon).

A starting date earlier than May 15 may be allowed when forage plant production proves to be suitable. A 35% utilization level on herbaceous plants would be set for those pastures where livestock have access to ephemeral and intermittent riparian drainages (Moonshine, North Knolls, Burn, Horse, Dines, North Pinchot, South Battleground, North, North McClintock, North Battleground, and McCarty) and within MSO protected activity centers (PACs). A maximum level of 45% would be set for those upland pastures with no riparian concerns (North Jumbo, South Jumbo). An increase of 5% utilization may be allowed during years of above average precipitation. Utilization levels would be measured at the end of the season.

In addition, if pastures are used as training pastures, the Forest Service will accept an additional 5% forage utilization, allowing for a maximum of 50% utilization. The pastures that would have this potential use include North Jumbo, South Jumbo, and most of the Horse pastures near Limestone Cabin, including Genes, Lane, Steer, Limestone, and North Holding pastures. Although Schneider Pasture is considered one of the Horse pastures, because it lays partially within an MSO PAC and has access to Yeager Canyon, forage utilization will be held to 35% in that pasture.

In addition to livestock grazing, the proposed action includes 200 acres of tree thinning in unrestricted MSO habitat. This thinning will take place in the Burn, South Battleground, and Horse pastures to ease the process of moving livestock through these pastures. Precommercial size trees (up to 9" dbh) will be removed and material will be broadcast burned on site.

Proposed Conservation Measures

Little Colorado Spinedace

- The permittee has agreed to allow supplemental stocking of spinedace in three drainages within the Buck Springs Range Allotment, which is required under an Arizona Game and Fish Commission Policy prior to stocking. This action will aid in the recovery of the species within the watershed. These drainages include Miller Canyon, General Springs, and Bear Canyon, and all of their tributaries. Following the acceptance of this biological opinion, the Forest Service and the permittee will provide letters to this effect to the Arizona Game and Fish Department (AGFD).

- The Yeager Canyon supplemental stocking site is considered a protected, occupied site for spinedace. Alternative G proposes a cattle guard and wing fences to split the North Pasture and aid in keeping livestock from accessing Yeager Canyon north of Forest Road 96 (FR96). Gap fences on Yeager Canyon are also being added as mitigation to Alternative G, both north and south of FR96, which will tie into bluffs to ensure that livestock do not move off the road, or up or down the canyon.

- The Dane Canyon III pool located in the southeast corner of North McClintock Pasture is considered a protected, occupied site for spinedace. Alternative G proposes a drift fence to help keep livestock out of this site.

- The only population of Little Colorado spinedace that appears to be persisting within the East Clear Creek watershed, other than the re-stocked Yeager Canyon site, occurs in West Leonard Canyon. Fish from this site were used to stock the Yeager Canyon site. West Leonard Canyon lies within the portion of Knolls pasture slated for removal from the allotment and will be completely protected from livestock.

- A fence excluded the Jones Crossing site and 1,200 acres from the McCarty Pasture in 1999. This exclosure was implemented to protect critical habitat and spinedace populations. Though fish have not been verified at this location in recent surveys, fish have historically occupied the site when water is present. Conditions downstream from this site have improved over the past five years. Bank stability has improved through an increase in herbaceous vegetation along the banks. However, riparian woody vegetation has not re-established. Alternative G proposes that livestock would not be allowed to graze the north side of East Clear Creek while in McCarty Pasture to ensure that they do not access the drainage.

- When livestock crossings of East Clear Creek are made, the crossing area will first be surveyed by a Forest Service fish biologist to ensure that there are no pools containing spinedace in the area of the crossing. If spinedace are found, no crossing in that area is permitted.

- Drainages that will be crossed when moving livestock include Miller, Bear, Dane and General Springs canyons, and Houston, Dick Hart, Yeager, and Merritt draws. The permittee uses wildlife and historic trails to cross these drainages, usually using side-draws. In 2001, the permittee used temporary electric fences and riders to exclude livestock from sensitive areas. These fences will be used to exclude livestock from pools as needed at all crossings and the permittee is required to have riders present to ensure that livestock do not scatter up and down drainages. Prior to the use of any stream course crossing by livestock, a fisheries biologist will survey for the presence of spinedace, and evaluate fish habitat conditions. If spinedace are located in, or found within the vicinity of, the crossing, then measures will be taken to protect spinedace and spinedace habitat.

- The Forest Service Interdisciplinary Team recommended that the North McClintock Pasture be included in the grazing rotation only if the permittee constructs a livestock exclosure around the McClintock meadow prior to using the pasture; the permittee constructs a drift fence on a shallow draw that drains into Dane Creek prior to using the pasture; and, livestock access to the pasture must be accomplished through shipping or use of the riders and temporary fences on the U-Bar Trail through Dane Canyon. If a new access route is located, the permittee must get the Forest Service's and Fish and Wildlife Services' concurrence prior to its use.

<u>Mexican Spotted Owl</u>

- If protected habitat outside of designated PACs, restricted, or target-threshold habitat has not been surveyed in the three years prior to implementation or has fewer than four years of surveys, the area will be surveyed for owls prior to implementation of the new allotment management plan. Additional MSO surveys were conducted in 2002, and this conservation measure fulfilled.

- New fences, waterlots, drylots, corrals, cattleguards, road closures, or other measures within PACs will be constructed and implemented outside of the breeding season or after non-nesting status has been determined.

- Livestock concentrations associated with gathering or mineral supplement sites will not occur within PACs during the breeding season.

- Utilization levels in grazed pastures will be monitored during and after use by livestock and at the end of the grazing season. If overall pasture levels are above acceptable utilization levels (35% utilization rate includes use by wild ungulates), livestock will be moved into the next pasture in the rotation. If all pastures are used prior to the originally scheduled off-date, livestock will be removed from the allotment. The monitoring plan for forage utilization is included in the amendment to the BAE (December 20, 2001). An increase of 5% utilization may be allowed during years of above average precipitation.

Chiricahua leopard frog

- All earthen tanks will be surveyed for Chiricahua leopard frogs prior to maintenance activities or construction of waterlots. Stock ponds will be maintained, if possible, to avoid impacts to adult frogs, tadpoles, and eggs.

- Riders and temporary fencing will be used to keep livestock from accessing East Clear Creek if Forest Roads 95 and 96 are used for moving livestock between pastures.

- The permittee and his employees will be instructed to sanitize or dry out equipment used in maintenance of stock tanks or after other activities occurring in wetland areas in order to prevent the spread of chytrid fungus.

STATUS OF THE SPECIES

Little Colorado Spinedace and Critical Habitat

The Little Colorado spinedace was listed as threatened with critical habitat designated on October 16, 1987 (USFWS 1987). Threats were identified as habitat alteration and destruction, predation by and competition with non-native aquatic organisms, and recreational fishery management. Forty-four stream miles of critical habitat were designated: 18 miles of East Clear Creek immediately upstream and 13 miles downstream from Blue Ridge Reservoir in Coconino County; eight miles of Chevelon Creek in Navajo County; and five miles of Nutrioso Creek in Apache County. Constituent elements of critical habitat consist of clean, permanent flowing water, with pools and a fine gravel or silt-mud substrate.

The spinedace is a small (about 4 inch) minnow native to the Little Colorado River (LCR) drainage. This fish occurs in disjunct populations throughout much of the LCR drainage in Apache, Coconino, and Navajo counties. Extensive collections summarized by Miller (1963) indicated that the spinedace had been extirpated from much of the historical range during the period 1939 to 1960. Although few collections were made of the species prior to 1939, the species is believed to have inhabited the northward flowing LCR tributaries of the Mogollon Rim, including the northern slopes of the White Mountains.

Food habits of spinedace include chironomid larvae, dipterians, filamentous green algae, and crustaceans (Runck and Blinn 1993, Blinn and Runck 1990). Spinedace are late spring to early summer spawners (Blinn 1993, Blinn and Runck 1990, Miller 1961, Minckley 1973, Minckley and Carufel 1967) although some females have been found to contain mature eggs as late as October (Minckley and Carufel 1967). A complete discussion of the taxonomic, distributional, and life history information of the spinedace has been compiled in the Little Colorado Spinedace Recovery Plan (USFWS 1998a).

Mitochondrial DNA work on the spinedace was initiated in the 1990's and indicated the existence of three sub-groups identifiable by geographic area (Tibbets *et al.* 1994): the East Clear Creek drainage, Chevelon Creek, and the upper Little Colorado including Nutrioso and Rudd creeks. The study concluded that the genetic patterns seen were likely the result of populations isolated and differentiated by both natural and human-caused events. The East Clear Creek and Chevelon Creek sub-groups are more individually distinctive, likely the result of a higher degree of isolation, and possess unique haplotypes. Individuals from the upper Little Colorado sub-group are more similar to each other. Possibly, until recent time, there was one population with considerable gene flow until various dams and diversions increased local isolation. The cause and exact time of the isolation of the three sub-groups are not known, but Tibbets *et al.* (1994) recommend that all of these populations be maintained to conserve genetic variation in this species.

As would be expected for a species adapted to fluctuating physical conditions, the spinedace is found in a variety of habitats (Blinn and Runck 1990, Miller 1963, Miller and Hubbs 1960, Nisselson and Blinn 1989). It is unclear whether occupancy of these habitats reflect the local preferences of the species or its ability to tolerate less than optimal conditions. Available information indicates that suitable habitat for the Little Colorado spinedace is characterized by clear, flowing pools with slow to moderate currents, moderate depths and gravel substrates (Miller 1963, Minckley and Carufel 1967). Cover from undercut banks or large rocks is often a feature. Spinedace have also been found in pools and flowing water conditions over a variety of substrates, with or without aquatic vegetation, in turbid and clear water (Denova and Abarca 1992, Nisselson and Blinn 1991). Water temperatures in occupied habitats ranged from 58 to 78 degrees Fahrenheit (Miller 1963). Miller (1963) called the spinedace “trout like” in behavior and habitat requirements, and it is likely that prior to 1900 the spinedace used habitats now dominated by non-native salmonids.

As with most aquatic habitats in the southwest, the Little Colorado River basin contains a variety of aquatic habitat types and is prone to rather severe seasonal and yearly fluctuations in water quality and quantity. Both mountain streams and lower gradient streams and rivers have provided habitat for the spinedace. Residual pools and spring areas are important refuges during periods of normal low water or drought. From these refuges, spinedace are able to recolonize other stream reaches during wetter periods. This ability to quickly colonize an area has been noted in the literature (Minckley and Carufel 1967) as well as in observations by others familiar with the species. Populations seem to appear and disappear over short time frames and this has made specific determinations on status and exact location of populations difficult. This tendency has been observed by both researchers and land managers (Miller 1963, Minckley 1965, Minckley 1973) and has led to concerns for the species’ survival.

The spinedace is still found in the streams it is known from historically (Chevelon, Silver, Nutrioso, East Clear Creek, and the LCR proper). However, populations are generally small and the true population size for any occupied stream is unknown due to the yearly fluctuations and difficulty in locating fish. Spinedace have a tendency to disappear from sampling sites from one year to the next and may not be found for several years. For example, the Silver Creek population was thought to be extirpated until fish were collected from the creek again in 1997. This ephemeral nature makes management of the species difficult since responses of the population to changes within the watershed cannot be measured with certainty.

Spinedace are currently considered rare in East Clear Creek (Denova and Abarca 1992). However, recent conservation actions in 2000 by the AGFD and the Coconino National Forest have led to the reintroduction of spinedace into three tributaries (Yeager Canyon, Houston Draw, and General Springs) of this drainage. Houston Draw and General Springs dried up and have not been monitored to determine the success of the stocking effort, though it is believed these stockings were unsuccessful. However, sampling of Yeager Canyon in October, 2001 located seven young-of-the-year and eight adult spinedace.

The current drought conditions are confounding cooperative recovery efforts for the Little Colorado spinedace in the East Clear Creek watershed. Recent inspections have found drying of the stream courses within the watershed. Of particular concern at this point are Dines Tank, West Leonard Canyon, and Yeager Canyon. Spinedace have been salvaged in the past year from both sites by the Forest Service and the AGFD. A pool in Dane Canyon held water throughout the summer of 2002 and 57 of the spinedace salvaged from West Leonard Canyon were stocked into Dane Canyon in August 2002.

Native fishes associated with spinedace include speckled dace (*Rhinichthys osculus*), bluehead sucker (*Pantosteus discobolus*), Little Colorado sucker (*Catostomus* sp.), roundtail chub (*Gila robusta*), and Apache trout (*Oncorhynchus gilae apache*) (USFWS 1998a). The list of non-native fishes is much larger and includes species with varying degrees of incompatibility with the spinedace's long-term survival. The presence of non-natives was one of the primary reasons the species was listed, and may contribute to the disjunct distribution patterns observed and the spinedace's retreat to what may be suboptimal habitats. Non-native fish may compete with, prey upon, harass, and alter habitat utilized by native fish. In the last 100 years, at least ten non-native fish species have been introduced into spinedace habitats. These include rainbow trout (*Oncorhynchus mykiss*), fathead minnow (*Pimephales promelas*) and golden shiner (*Notemigonus crysoleucus*). Surveys in East Clear Creek have documented the presence of these three non-native species and brown trout (*Salmo trutta*) in the watershed (Denova and Abarca 1992). Data from research experiments and field observations indicate that at least the rainbow trout is a predator and potential competitor with the spinedace (Blinn *et al*. 1993).

Since the spinedace was listed, the Rudd Creek population was discovered. There is currently one refugial population of East Clear Creek spinedace (located at the Flagstaff Arboretum), totaling about 340 individuals. There are no refugial populations for the other two genetic sub-groups. All of the known populations have decreased since 1993 and drought conditions continue to put additional strain on all known populations.

Mexican Spotted Owl

The MSO was listed as a threatened species in 1993 (USDI 1993). Critical habitat was designated for the species on June 6, 1995 (USFWS 1995), but was later withdrawn (USFWS 1998b). Critical habitat was redesignated in 2001; no U.S. Forest Service lands were designated as critical habitat. The primary threats to the species were cited as even-aged timber harvest and the threat of catastrophic wildfire, although grazing, recreation, and other land uses were also mentioned as possible factors influencing the MSO population. The Fish and Wildlife Service appointed the Mexican Spotted Owl Recovery Team in 1993, which produced the Recovery Plan for the Mexican Spotted Owl (Recovery Plan) in 1995 (USDI 1995).

A detailed account of the taxonomy, biology, and reproductive characteristics of the MSO is found in the Final Rule listing the MSO as a threatened species (USDI 1993) and in the Recovery Plan for the Mexican Spotted Owl (Recovery Plan) (USDI 1995a). The information provided in those documents is included herein by reference. Although the MSO's entire range covers a broad area of the southwestern United States and Mexico, the MSO does not occur uniformly throughout its range. Instead, it occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Surveys have revealed that the species has an affinity for older, well-structured forest, and the species is known to inhabit a physically diverse landscape in the southwestern United States and Mexico.

The U.S. range of the MSO has been divided into six recovery units (RU), as discussed in the Recovery Plan. The Recovery Plan reports an estimate of owl sites for 1990-1993. At that time, the greatest concentration of known owl sites in the United States occurred in the Upper Gila Mountains RU (55.9%), in which this project is located. Similarly, the Forest Service reported a total of approximately 935 PACs established on National Forest lands in the Southwestern Region, with 542 PACs (58%) in the Upper Gila Mountain RU (USDA Forest Service, Southwestern Region, February 28, 2001).

A reliable estimate of the numbers of owls throughout its entire range is not currently available (USDI 1995a) and the quality and quantity of information regarding numbers of MSO vary by source. USDI (1991) reported a total of 2,160 owls throughout the United States. Fletcher (1990) calculated that 2,074 owls existed in Arizona and New Mexico. However, Ganey *et al.* (2000) estimates approximately 2,950 ± 1,067 (SE) MSOs in the Upper Gila Mountains RU alone.

The primary administrator of lands supporting the MSO in the United States is the Forest Service. Most owls have been found within Forest Service Region 3 (including 11 National Forests in Arizona and New Mexico). Forest Service Regions 2 and 4 (including 2 National Forests in Colorado and 3 in Utah) support fewer owls. According to the Recovery Plan, 91% of MSO known to exist in the United States between 1990 and 1993 occurred on lands administered by the Forest Service.

The Upper Gila Mountains RU is a relatively narrow band bounded on the north by the Colorado Plateau RU and to the south by the Basin and Range-West RU. The southern boundary of this RU includes the drainages below the Mogollon Rim in central and eastern Arizona. The eastern boundary extends to the Black, Mimbres, San Mateo, and Magdalena mountain ranges of New Mexico. The northern and western boundaries extend to the San Francisco Peaks and Bill Williams Mountain north and west of Flagstaff, Arizona. This is a topographically complex area consisting of steep foothills and high plateaus dissected by deep forested drainages. This RU can be considered a "transition zone" because it is an interface between two major biotic regions: the Colorado Plateau and Basin and Range Provinces (Wilson 1969). Most habitat within this RU is administered by the Kaibab, Coconino, Apache-Sitgreaves, Tonto, Cibola, and Gila national forests. The north half of the Fort Apache and northeast corner of the San Carlos Indian reservations are located in the center of this RU and also support MSOs (USDI 1995a).

The Upper Gila Mountains RU consists of pinyon/juniper woodland, ponderosa pine/mixed conifer forest, some spruce/fir forest, and deciduous riparian forest in mid- and lower-elevation canyon habitat. Climate is characterized by cold winters and over half the precipitation falls during the growing season. Much of the mature stand component on the gentle slopes surrounding the canyons had been partially or completely harvested prior to the species' listing as threatened in 1993, however, MSO nesting habitat remains in steeper areas. MSO are widely distributed and use a variety of habitats within this RU. Owls most commonly nest and roost in mixed-conifer forests dominated by Douglas fir and/or white fir, and canyons with varying degrees of forest cover (Ganey and Balda 1989, USDI 1995a). Owls also nest and roost in ponderosa pine-Gambel oak forest, where they are typically found in stands containing well-developed understories of Gambel oak (USDI 1995a).

Mexican spotted owls consume a variety of prey throughout their range, but commonly eat small and medium-sized rodents such as woodrats (*Neotoma* spp.), peromyscid mice, and microtine voles. They may also consume bats, birds, reptiles, and arthropods (Ward and Block 1995). Habitat correlates of the owl's common prey emphasize that each prey species uses a unique microhabitat. Deer mice (*Peromyscus maniculatus*) are ubiquitous in distribution in comparison to brush mice (*P. boylei*) which are restricted to drier, rockier substrates with sparse tree cover. Mexican woodrats (*N. mexicana*) are typically found in areas with considerable shrub or understory tree cover and high log volumes or rocky outcrops. Mexican voles (*Microtus mexicanus*) are associated with herbaceous cover, primarily grasses, whereas long-tailed voles (*M. longicaudus*) are found in dense herbaceous cover, primarily forbs, with many shrubs, and limited tree cover. Prey availability is determined by the distribution, abundance, and diversity of prey and by the owl's ability to capture it. A diverse prey base is dependent on the availability and quality of diverse habitats.

Prey that positively influence MSO survival, reproduction, or number may increase the likelihood of persistence of spotted owl populations (USDI 1995a). Male owls must provide enough food to their mates during incubation and brooding to prevent abandonment of nests or young; accordingly, ecologists suspect that spotted owls select habitats partially because of the availability of prey (Ward and Block 1995). In two studies in Arizona and New Mexico, Ward and Block (1995) found that the owl's food is most abundant during the summer months when young are being raised. Decreases in prey biomass occur from late fall through the winter. Seasonal decreases like these are typical of small mammal populations. Ward and Block (1995) state that conditions that increase winter food resources will likely improve conditions for the owl because this will increase the likelihood of egg laying and decrease the rate of nest abandonment. Thus, food availability in the winter as well as in the summer is important for owl reproduction.

In 1996, the Fish and Wildlife Service issued a biological opinion on Forest Service Region 3's adoption of the Recovery Plan recommendations through an amendment of their Forest Plans. In this non-jeopardy biological opinion, we anticipated that approximately 151 PACs would be affected by activities that would result in incidental take of MSOs, with 92 of those PACs located in the Upper Gila Mountains RU. To date, consultation on individual actions under the amended Forest Plans have resulted in 199 PACs adversely affected, with 88 of those in the Upper Gila Mountains RU.

In addition to actions proposed by the Forest Service, Region 3, we have also reviewed the impacts of actions proposed by the Bureau of Indian Affairs, Department of Defense (including Air Force, Army, and Navy), Department of Energy, National Park Service, and Federal Highway Administration. These proposals have included timber sales, road construction, fire/ecosystem management projects (including prescribed natural and management ignited fires), livestock grazing, recreation activities, utility corridors, military and sightseeing overflights, and other activities. Only one of these projects (release of site-specific owl location information) has resulted in a biological opinion that the proposed action would likely jeopardize the continued existence of the MSO. Since the owl was listed, we have completed a total of 98 formal consultations that have anticipated incidental take of MSOs in 267 PACs.

<u>Chiricahua Leopard Frog</u>

The Chiricahua leopard frog was listed as a threatened species without critical habitat, effective July 13, 2002 (USDI 2002). The frog is distinguished from other members of the *Rana pipiens* complex by a combination of characters.

The Chiricahua leopard frog is an inhabitant of cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 to 8,890 feet in central and southeastern Arizona; west-central and southwestern New Mexico; and in Mexico, northern Sonora, and the Sierra Madre Occidental of Chihuahua, northern Durango and northern Sinaloa (Platz and Mecham 1984, Degenhardt *et al.* 1996, Sredl *et al.* 1997). 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. In New Mexico, of sites occupied by Chiricahua leopard frogs from 1994-1999, 67 percent were creeks or rivers, 17 percent were springs or spring runs, and 12 percent were stock tanks (Painter 2000). In Arizona, slightly more than half of known historic localities are natural lotic systems, a little less than half are stock tanks, and the remainder are lakes and reservoirs (Sredl *et al.* 1997). Sixty-three percent of currently extant populations in Arizona occupy stock tanks (Sredl and Saylor 1998).

Populations on the Mogollon Rim are disjunct from those in southeastern Arizona. Based on preliminary analysis of allozymes, the Rim populations may represent a taxon distinct from the southern populations (James Platz, Creighton University, pers. comm. 2000). However, mitochondrial DNA work at the University of Denver does not support this conclusion (N. Benedict, pers. comm. 1999). Additional work is needed to clarify the genetic relationship among Chiricahua leopard frog populations.

Die-offs of Chiricahua leopard frogs were first noted in former habitats of the Tarahumara frog (*Rana tarahumarae*) in Arizona at Sycamore Canyon in the Pajarito Mountains (1974) and Gardner Canyon in the Santa Rita Mountains (1977-78) (Hale and May 1983). From 1983-1987, Clarkson and Rorabaugh (1989) found Chiricahua leopard frogs at only two of 36 Arizona localities that had supported the species in the 1960s and 1970s. Two new populations were reported. During extensive surveys from 1995-2000, primarily by AGFD personnel, Chiricahua leopard frogs were observed at 60 localities in Arizona (Sredl *et al.* 1997, Rosen *et al.* 1996, Fish and Wildlife Service files). In New Mexico, the species was found at 41 sites from 1994 -1999; 31 of those were verified extant during 1998-1999 (Painter 2000). During May-August 2000, the Chiricahua leopard frog was found extant at only eight of 34 sites where the species occurred in New Mexico during 1994-1999 (C. Painter, pers. comm. 2000). The species has been extirpated from about 75 percent of its historical localities in Arizona and New Mexico. The status of the species in Mexico is unknown.

Based on Painter (2000) and the latest information for Arizona, the species is still extant in all major drainages in Arizona and New Mexico where it occurred historically; however, it has not been found recently in many historically occupied rivers, valleys, and mountains ranges. In many of these regions, Chiricahua leopard frogs have not been found for a decade or more despite repeated surveys. Recent surveys suggest the species may have recently disappeared from some major drainages in New Mexico (C. Painter, pers. comm. 2000).

Threats to this species include predation by non-native organisms, especially bullfrogs, fish, and crayfish; disease; drought; floods; degradation and destruction of habitat; water diversions and groundwater pumping; disruption of metapopulation dynamics; altered fire regimes; increased chance of extirpation or extinction resulting from small numbers of populations and individuals; and environmental contamination. Numerous studies indicate that declines and extirpations of Chiricahua leopard frogs are at least in part caused by predation and possibly competition by non-native organisms, including fish in the family Centrarchidae (*Micropterus* spp., *Lepomis* spp.), bullfrogs (*Rana catesbeiana*), tiger salamanders (*Ambystoma tigrinum mavortium*), crayfish (*Oronectes virilis* and possibly others), and several other species of fish (Fernandez and Rosen 1998, Rosen *et al.* 1996 and 1994, Snyder *et al.* 1996, Fernandez and Bagnara 1995, Sredl and Howland 1994, Clarkson and Rorabaugh 1989). For instance, in the Chiricahua region of southeastern Arizona, Rosen *et al.* (1996) found that almost all perennial waters investigated that lacked introduced predatory vertebrates supported Chiricahua leopard frogs. All waters except three that supported introduced vertebrate predators lacked Chiricahua leopard frogs. Sredl and Howland (1994) noted that Chiricahua leopard frogs were nearly always absent from sites supporting bullfrogs and non-native predatory fish. Rosen *et al.* (1996) suggested further study was needed to evaluate the effects of mosquitofish, trout, and catfish on frog presence.

Disruption of metapopulation dynamics is likely an important factor in regional loss of populations (Sredl *et al.* 1997, Sredl and Howland 1994). Chiricahua leopard frog populations are often small and habitats are dynamic, resulting in a relatively low probability of long-term population persistence. Historically, populations were more numerous and closer together. If populations disappeared due to drought, disease, or other causes, extirpated sites could be recolonized via immigration from nearby populations. However, as numbers of populations declined, populations became more isolated and were less likely to be recolonized if extirpation occurred. Also, most of the larger source populations along major rivers have disappeared.

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. As a group, leopard frogs are surprisingly good at dispersal. In Michigan, young northern leopard frogs (*Rana pipiens*) commonly move up to 0.5 mile from their place of metamorphosis, and 3 young males established residency up to 3.2 miles from their place of metamorphosis (Dole 1971). Both adults and juveniles wander widely during wet weather (Dole 1971). In the Cypress Hills, southern Alberta, young-of-the year northern leopard frogs successfully dispersed to downstream ponds 1.3 miles from the source pond, upstream 0.6 mile, and overland 0.25 mile. At Cypress Hills, a young-of-the-year northern leopard frog moved approximately 5 miles in one year (Seburn *et al*. 1997). The Rio Grande leopard frog *(Rana berlandieri*) in southwestern Arizona has been observed to disperse at least 1 mile from any known water source during the summer rainy season (Rorabaugh, in press). After the first rains in the Yucatan Peninsula, Rio Grande leopard frogs have been collected several miles from water (Campbell 1998). In New Mexico, Jennings (1987) noted collections of Rio Grande leopard frogs from intermittent water sources and suggested these were frogs that had dispersed from permanent water during wet periods.

Dispersal of leopard frogs away from water in the arid Southwest may occur less commonly than in mesic environments in Alberta, Michigan, or the Yucatan Peninsula during the wet season. However, there is evidence of substantial movements even in Arizona. In August, 1996, Rosen and Schwalbe (1998) found up to 25 young adult and subadult Chiricahua leopard frogs at a roadside puddle in the San Bernardino Valley, Arizona. They believed that the only possible origin of these frogs was a stock tank located approximately 3.4 miles away. Rosen *et al.* (1996) found small numbers of Chiricahua leopard frogs at two locations in Arizona that 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 found that the likely source of these animals were populations 1.2 to 4.3 miles distant. In the Dragoon Mountains, Arizona, Chiricahua leopard frogs breed at Halfmoon Tank, but frogs occasionally turn up at Cochise Spring (0.8 mile down canyon in an ephemeral drainage from Halfmoon Tank) and in Stronghold Canyon (1.1 miles down canyon from Halfmoon Tank). There is no breeding habitat for Chiricahua leopard frogs at Cochise Spring or Stronghold Canyon, 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 Silver Creek stock tank after the tank dried up; but frogs then began to appear in Cave Creek, which is about 0.6 mile 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 and auditory cues, and possibly celestial orientation, as guides (Dole 1968, 1972). Rainfall or 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).

The role of the chytridiomycete skin fungi in the population dynamics of the Chiricahua leopard frog is as yet undefined; however, it may prove to be an important contributing factor in observed population decline. In Arizona, chytrid infections have been reported from four populations of Chiricahua leopard frogs (M. Sredl, pers. comm. 2000). The disease was recently reported from a metapopulation of Chiricahua leopard frogs from New Mexico; that metapopulation may have been extirpated (C. Painter, pers. comm. 2000). Rapid death of recently metamorphosed frogs in stock tank populations of Chiricahua leopard frogs in New Mexico was attributed to post-metamorphic death syndrome (Declining Amphibian Populations Task Force 1993). Hale and May (1983) and Hale and Jarchow (1988) believed toxic airborne emissions from copper smelters killed Tarahumara frogs and Chiricahua leopard frogs in Arizona and Sonora. However in both cases, symptoms of moribund frogs matched those of chytridiomycosis. Chytrids were recently found in a specimen of Tarahumara frog collected during a die off in 1974 in Arizona. This earliest record for chytridiomycosis corresponds to the first observed mass die-offs of ranid frogs in Arizona.

The fungus does not have an airborne spore, so it must spread via other means. Amphibians in the international pet trade (Europe and U.S.), outdoor pond supplies (U.S.), zoo trade (Europe and U.S.), laboratory supply houses (U.S.), and species recently introduced (*Bufo marinus* in Australia and bullfrog in the USA) have been found infected with chytrids, suggesting human-induced spread of the disease (Daszak 2000). Chytrids could also be spread by tourists or fieldworkers sampling aquatic habitats (Halliday 1998). The fungus can exist in water or mud and thus could be spread by wet or muddy boots, vehicles, cattle, and other animals moving among aquatic sites, or during scientific sampling of fish, amphibians, or other aquatic organisms.

Native riparian ecosystems, especially in the Southwest, are disappearing rapidly and this could play a vital role in the recovery of the Chiricahua leopard frog. Because riparian zones often follow the gradual elevation changes of a watershed, they are often desirable for road and pipeline construction. In the early years of livestock management, emphasis was on the uplands with very little concern for riparian areas. In fact, riparian areas were considered "sacrifice areas" in range management schemes. As a result, serious damage to stream channels and aquatic habitat occurred. It was not until the 1970s that serious consideration was given to managing riparian areas.

The only extant populations of Chiricahua leopard frogs on the Coconino National Forest occur within the Buckskin Hills/Mud Tanks area, approximately 20 miles to the west of the Buck Springs Allotment. Ten occupied sites are currently known in about six square sections covering approximately 4,000 acres. Three other sites contained frogs in 1993, but surveys have not located frogs since that time. These tanks occur within the Horseshoe Reservoir and Fossil Creek 5th code watersheds, within the Verde Basin. Records exist from other locations along the Mogollon Rim, including the East Clear Creek and West Clear Creek drainages, but these sites have been unoccupied since at least the mid-1980s. During the summer of 2002, the Fish and Wildlife Service, Forest Service, and AGFD salvaged 18 frogs from Walt's Tank and provided supplemental water to Sycamore Basin Tank. Currently, Sycamore Basin Tank is the only site on the Coconino National Forest known to support Chiricahua leopard frogs. Tank restoration activities in three to four tanks occurred over the winter in order to increase habitat for the frogs.

Additional information about the Chiricahua leopard frog can be found in Sredl *et al.* (1997), Jennings (1995), Degenhardt *et al.* (1996), Rosen *et al.* (1996, 1994), Sredl and Howland (1994), Platz and Mecham (1984, 1979), and Painter (2000).

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

Elevation ranges from 7,800 feet at the southern end of the allotment on the Mogollon Rim, to 6,400 feet at the northern boundary of the allotment on East Clear Creek. The land slopes generally downward from south to north, draining into East Clear Creek, which drains into the Little Colorado River. The allotment is characterized by deep, steep-sided, narrow canyons, and broad, relatively flat ridgetops. Major drainages within the allotment include portions of Leonard Canyon, Barbershop Canyon, Yeager Canyon, Bear Canyon, General Springs Canyon, Miller Canyon, Dane Springs Canyon, and Buck Springs Canyon.

The southern one-third of the allotment is adjacent to the Mogollon Rim and is dominated by multi-storied, mixed conifer habitat. The northern portion of the allotment receives less precipitation and is dominated by ponderosa pine habitats. The canyons are occupied by pockets of mixed-conifer, which extend into the northernmost pastures.

The Parker Three-Step method is a process for determining the range condition relative to the land's ability or value for grazing livestock. This method can be utilized to provide trend information for determining a resource value for grazing; however, Parker Three-Step transects do not provide information on the ecological status of an area. The BAE states that Parker Three-Step measurements of vegetation conditions showed that 31% of the clusters rated as poor condition, 38% as fair condition, 25% as good condition, and 6% as excellent condition. These transects were read in 1998 and showed either a static condition or no apparent trend compared to readings in 1977 and 1989. This means that as far as livestock are concerned, the allotment will provide forage and the direction of change in response to past and existing livestock management practices is steady (i.e., no change from 1977 to 1989 to 1998). Soil survey data from Terrestrial Ecosystem Survey Data and field information indicate that soils are in primarily "satisfactory" condition, with 68,380 acres (96%) in satisfactory condition; 2,100 acres (3%) in impaired condition; and 412 acres (<1%) in unsatisfactory condition. The unsatisfactory soils are generally in the headwater meadows. In summary, although we have some data indicating range condition from a grazing perspective and some soil condition data, little information has been collected that indicates the ecological condition of the allotment as it relates to the species of concern and their habitat.

Riparian assessments using the Bureau of Land Management's Proper Functioning Condition protocol were conducted in the East Clear Creek portion of the allotment in the summer/fall of 1995, and again in 1998. These assessments identified 94 miles (66%) of streams in proper functioning condition, 34 miles (24%) of functional-at-risk streams, and 14 miles (10%) of non-functional riparian streams. The non-functional reaches occur primarily in headwater meadows, while functional-at-risk streams are primarily located in shallow drainages. In addition to the riparian stream courses, there are approximately 80 miles of non-riparian drainages within the allotment.

<u>Little Colorado Spinedace and Critical Habitat</u>

A. Status of the species and its critical habitat within the action area

The status of the spinedace has been declining within the East Clear Creek watershed since its 1987 listing and faces the potential of extirpation. The Little Colorado Spinedace Recovery Plan (USFWS 1998a) lists the East Clear Creek population as second in order of those populations in imminent danger of extinction, and states that the loss of any population of spinedace significantly increases the risk of extinction for the species (USFWS 1998a). Therefore, any impacts to this species in this watershed are considered extremely serious and warrant careful monitoring. The East Clear Creek population of spinedace has been recorded primarily from the mainstem of the creek and in portions of Leonard Canyon. As stated previously, this population fluctuates widely and is usually found in small, isolated pockets of habitat. A key factor in the presence of the fish appears to be the quantity of water in the systems. Over the past several years, personnel from the Coconino National Forest, the Forest Service's Rocky Mountain Research Station, the AGFD, and Northern Arizona University have conducted surveys for spinedace. These surveys have indicated that spinedace population levels in the East Clear Creek system have continued to decline.

Spinedace have been observed at six locations within the allotment in recent years. Observations within critical habitat, adjacent to the allotment include: (1) the Jones Crossing population (1993, 1994, 1995); (2) near the mouth of Miller Canyon (1994); and (3) below Blue Ridge Reservoir (1995 through 1997). Three populations, which are not in critical habitat, have been observed in Leonard Canyon and its tributaries: (1) in Dines Tank (1969 through 1993, 1999, 2002); (2) in West Leonard Canyon (1994, 1999, 2000, 2001, 2002); and (3) in Leonard Canyon between the confluences of Buck Springs Canyon and West Leonard Canyon (1997). Of all the drainages surveyed in 1999 and 2000, West Leonard Canyon was the only drainage to contain spinedace. The pools containing spinedace in West Leonard Canyon were located within the same general vicinity as those found in 1994 (White 1995).

With the exception of the last three years, Dines Tank has been noted as one of the few dependable waters to contain a source population of spinedace. The lack of spinedace in recent past fish collections from Dines Tank (2000, 2001) has been attributed to an abundance of non-native crayfish, fathead minnows, and trout. The lack of a winter snow pack, followed by extremely dry spring conditions, has reduced Dines Tank to a fraction of its normal volume. Given the current conditions in Dines Tank, Region II of the AGFD and the Coconino National Forest salvaged 38 adult spinedace from Dines Tank on May 7, 2002. Though the live salvage of fish from Dines Tank last year was an emergency measure, it does indicate that fish most likely were present during 2000 and 2001.

Since the summer of 2000, of all the drainages inventoried within the East Clear Creek watershed, spinedace were only known to exist in West Leonard and Leonard Canyons (Dines Tank). Surveys completed to date this year have found that West Leonard Canyon and its major tributaries are all virtually dry due to drought conditions. All but one pool in West Leonard Canyon that contained spinedace in 2001 were non-existent in 2002 and the pool in West Leonard Canyon that has consistently contained a significant number of spinedace almost completely dried. Given those conditions, Forest Service and AGFD Region II personnel salvaged approximately 128 spinedace from this pool on June 27, 2002.

During the spring of 2000, the AGFD stocked approximately 50 spinedace in Houston Draw (Aspen Springs Horse Pasture); and approximately 30 spinedace in General Springs Canyon (South Battleground Pasture). These spinedace were translocated from the spinedace refugium at the Flagstaff Arboretum pond. Due to a lack of water, these two sites do not appear to have been successful stocking sites.

During the summer of 2000, Forest Service survey crews completed habitat inventory and fish sampling surveys in Yeager, Kehl, Dane, and Bear canyons and in the upper portion of East Clear Creek within the Buck Springs Allotment. All of these drainages were found to contain potentially suitable spinedace habitat, but no spinedace were found. Despite extremely dry conditions, several larger pools in each of those five drainages retained sufficient depth to provide suitable sites for supplemental stocking of Little Colorado spinedace. Based on this work, 99 spinedace of East Clear Creek watershed origin were translocated into Yeager Canyon in November, 2000. A May 2001 survey found that spinedace overwintered in Yeager Canyon and an October, 2001 survey found young-of-the-year and adult spinedace in the canyon below the 96 Road Crossing (North Pasture). However, due to drought conditions this year, spinedace located in Yeager Canyon on April 8, 2002 were salvaged in order to avoid losing the fish completely.

In summary, land managers salvaged fish from all known populations of Little Colorado spinedace within the East Clear Creek watershed within the past year and placed these fish in a refugium in order to preserve this genetic sub-group of spinedace. However, we know that not all spinedace were removed from the salvaged pool in West Leonard Canyon and we are hopeful that the pool and those spinedace persisted. In addition, the Forest Service stocked 57 spinedace into Dane Canyon on August 15, 2002.

Thirty-one miles of critical habitat for the spinedace has been designated in East Clear Creek within the Coconino National Forest. Constituent elements of critical habitat consist of clean, permanent flowing water, with pools and a fine gravel or silt-mud substrate. Critical habitat is designated from Potato Lake in the headwaters to Blue Ridge Reservoir (8 miles) and below Blue Ridge Dam to the confluence with Leonard Canyon (6 miles). Critical habitat is not designated for Leonard Canyon.

In addition to critical habitat, Leonard Canyon and other major tributaries to East Clear Creek contain historical, suitable, and/or potential spinedace habitat. Approximately 35 miles of East Clear Creek are considered habitat for the spinedace, as are the several major tributaries that drain into East Clear Creek.

The Kehl and Leonard Canyon sub-watersheds were evaluated in 1993 (Hydro Science 1993) under a contract with the Forest Service. This contract report provides specific information on stream reaches most important to the spinedace in the East Clear Creek drainage. We have included only a discussion of Leonard Canyon, as Kehl Canyon lies within the Hackberry-Pivot Rock Allotment.

The Leonard Canyon watershed analysis area included the mainstem and tributaries of Leonard Canyon including Buck Springs Canyon. The portion of the watershed east of the canyon itself is not included in the allotment under consultation and is on the Apache-Sitgreaves National Forest. The western portion of the watershed is on the Buck Springs Range Allotment in the Knolls, Horse, Dines, and North pastures.

Natural erosion risk in the Leonard Canyon watershed is generally slight, with severe risk occurring at the upper ends of the drainages. Watershed conditions are generally satisfactory although many areas are below potential. Stream reaches in these upper areas are largely dysfunctional condition, or are at-risk. Stream stability is 94% fair and 6% good in the 17.2 miles of stream evaluated (Hydro Science 1993). Sediment load in these streams is low.

With no flow gages on Leonard Canyon, specific flow data are not available. However, East Clear Creek and its tributaries in the Leonard Canyon watershed are ephemeral. Most of the flows are the result of runoff from snowmelt in March and April, with localized contributions from summer monsoon rains. Peak flows can be quite high and the most recent high flows were 1993. Some pools are found in the streams when there is no flowing surface water. Although these pools are often isolated, they provide the only fish habitat available during dry periods. Scattered pools, such as Dines Tank, normally persist through the seasonal dry periods. However, under current drought conditions, these pools are not holding water.

Some historical background on riparian conditions is contained in the Hydro Science (1993) report. The present conditions of streams in the area in not the condition that would have existed without the overgrazing that began in the late 1800's and continued through the 1950's. Even if some stream reaches are considered “functional” today, it does not mean that they are in good condition relative to the pre-overuse baseline. A wide, gravel-cobble wash is a very different system compared to a narrow, meandering stream channel bordered by riparian vegetation.

The streams in the allotment are now ephemeral. While this may be the baseline condition, the amount of time when there are no flows may have increased as bank storage declined due to erosive gullying and downcutting, and runoff increased as vegetation was reduced. This has had a significant effect on the availability and quantity of fish habitat in the stream reaches under consideration in this consultation.

Spinedace habitats in the East Clear Creek drainage and within the project area have been altered by the construction of dams on the mainstem and tributaries such as Blue Ridge Reservoir, Knoll Lake, and Bear Lake. Past land-management activities have included timber harvest, livestock grazing, road construction and maintenance, recreational development and usage, fire management, and inter-basin water diversions that have altered the habitat. These activities have affected watershed function, runoff patterns, peak flows, seasonal flows, riparian vegetation, wet meadow functions, bank erosion, siltation, and water quality. Wildlife and fisheries management largely associated with providing hunting or fishing opportunities has altered the faunal component of the habitat. Introduction of non-native trouts, baitfish, and crayfish at Blue Ridge and Knoll Lake Reservoirs have increased competition for available resources and possibly predation on spinedace. In addition, there is concern that elk (*Cervus elaphus*) are much more abundant in the East Clear Creek drainage than they were historically, and that they may have a significant effect on the existing riparian and aquatic habitats. The Forest Service is working with the AGFD to determine the carrying capacity for elk and the appropriate adjustment of elk numbers within the East Clear Creek watershed.

Soils conditions are classified as satisfactory over 96% of the allotment, 3% are considered impaired, and less than 1% are classified as unsatisfactory. The mountain meadows make up the unsatisfactory areas due to heavy grazing and recreation pressures that have reduced ground cover, compacted soils, and contributed to the lowering of the water table. Meadow areas are located within almost every headwater drainage across the southern end of the allotment and much concern exists over the current condition of these meadows. Compaction and unsatisfactory soil conditions in the headwater meadows lead to increased runoff, sedimentation, and reduced baseflows, which have the potential of negatively impacting spinedace habitat much farther downstream.

Fire management has also probably had an effect on the hydrology of the watershed. Historically, fires burned through the pine forest and created a mosaic of stand sizes, ages, and densities. The success of suppression efforts over the past 100 years has resulted in densely stocked forests with high canopy closure. This increase in the number of trees within the watershed imposes a negative effect on the hydrologic cycle.

Approximately 36 miles of streams classified as functional, 13 miles of at-risk streams, and two miles of non-functional streams may be accessed by livestock. Riparian assessments (Proper Functioning Condition) conducted in 1995 and 1998 classified stream reaches in steep canyons, where ungulate access is very limited and physical characteristics make them more resistant to effects of upstream activities, were classified as “functional” riparian corridors (66% of the stream reaches within the allotment). Another 24% of the stream reaches are considered “functional-at-risk” and are generally smaller, shallow drainage habitats that are more accessible by both livestock and elk. “Non-functional” riparian stream courses comprise approximately 10% of the streams within the allotment. These drainages tend to occur in the flatter, southern portions of drainages, especially within the mountain meadows. These areas have been heavily grazed by both livestock and elk, and exhibit compacted soils and downcut banks. Exclosures in four meadows show that areas grazed only by elk are only slightly less utilized than areas grazed by both elk and livestock. It is unclear whether this is a function of the large number of elk in the area, and/or the displacement of elk from areas livestock graze. However, meadow areas protected from all ungulate grazing exhibit a significantly greater production of grasses, forbs, and willows; and increased retention of subsurface water.

Studies in the East Clear Creek areas indicate that past intensive grazing by ungulates has resulted in considerable change to the historical condition of aquatic and riparian habitats and thus the habitat available for spinedace (Hydro Science 1993). In some areas, the channels are moving toward, or have achieved, stability although it is not the same as the pre-overuse stability. Recovery of the streams and associated floodplains and riparian areas to those historical conditions may be extremely difficult, if not impossible, to attain.

B. Factors affecting species’ environment within the action area

Two additional range allotments lie within the Coconino National Forest portion of the East Clear Creek watershed. These two allotments, the Bar-T-Bar and Hackberry/Pivot Rock Allotments, include and/or border spinedace critical habitat. Impacts from the Bar-T-Bar are low because livestock have rare/infrequent access to East Clear Creek (pers. comm. Jerry Gonzales 2003), the allotment does not include headwater meadows, and soil and watershed conditions are predominantly satisfactory. Fence construction eliminated livestock access to critical and suitable habitat within the Hackberry/Pivot Rock Allotment.

Soil compaction results from roads, timber harvest operations, recreational development, and dispersed recreation. The impacts of dispersed recreation are most pronounced along East Clear Creek near Poverty Flat (within the Hackberry/Pivot Rock Allotment). Watershed assessments in selected sub-watersheds within East Clear Creek found limited impacts associated with timber harvest and roads (Hydro Science 1993). This may be true for the harvest units themselves, however, the density and location of roads within the watershed continues to be a concern.

Because the streams are located in the head of the watershed, conditions within this allotment can only be attributed to upstream activities under the control of the Coconino National Forest. There is only a limited amount of non-Federal land in the area of the allotment and, with the exception of the operation of Blue Ridge Dam, the Coconino National Forest has management authority over the majority of the lands involved. Outside entities have a limited, though potentially critical, effect on water availability within the East Clear Creek watershed.

Permanent flowing water is a primary constituent element of critical habitat for the Little Colorado spinedace. Therefore, water currently being withdrawn from the area, and potentially lost to the watershed, will affect habitat for the species. Currently, there are several projects either on-going or planned that divert water from this watershed. The improvement list for the Buck Springs Allotment includes 115 tanks, 29 borrow pits, 17 springs, and 10 backhoe springs. There are also two reservoirs located within the project area (Blue Ridge and Knoll Lake Reservoirs). Currently, water from Blue Ridge Reservoir is pumped into the East Verde River. Livestock tanks, reservoirs, and water rights all have the potential to reduce the quality of habitat for the spinedace. In addition, the Blue Ridge Reservoir, Knoll Lake Reservoir, and ongoing water rights adjudication procedures all have the potential to affect spinedace habitat and critical habitat within the project area.

Water rights adjudication procedures are in progress for Blue Ridge Reservoir, with the Navajo Nation claiming the water rights and the City of Payson negotiating for the purchase of water in the future. Gila County is also currently applying for water rights (approximately 10 cfs) from Fossil Creek to supply water for the communities of Pine, Strawberry, and Payson to allow for growth. Though Fossil Creek drains into the Gila Basin, the point is that many growing communities in the area are looking for reliable water sources. These procedures may ultimately mean less water would be available for the spinedace within the East Clear Creek watershed, and habitat destruction from impoundment and de-watering of East Clear Creek will continue to impact the environmental baseline of this species.

<u>Mexican Spotted Owl</u>

A. Status of the species within the action area

On the Coconino National Forest, the MSO occupies mixed conifer and ponderosa pine-Gambel oak vegetation. The habitat is characterized by high canopy closure, high stem density, multi-layered canopies within the stand, numerous snags, and coarse woody debris.

The primary goals of the Recovery Plan are: (1) the protection of both occupied habitats and unoccupied areas on steep slopes; (2) management of unoccupied mixed conifer and pine-oak vegetation to provide foraging habitat and future nesting areas; and (3) implementation of ecosystem management principles within the remaining forested areas in the owl's range. The Recovery Plan also focuses on actions to alleviate threats to the owl, particularly catastrophic wildfire and the widespread use of even-aged silviculture. Habitat is classified as "protected" (PACs and steep slopes), "restricted" (mixed-conifer, pine-oak, and riparian habitats), or "unrestricted" (ponderosa pine, spruce-fir, pinyon-juniper, and aspen habitats) in decreasing order of owl-management emphasis. The Recovery Plan advocates an adaptive management approach (using population and habitat monitoring) to assess the success of management activities. Activities that concentrate livestock within PACs, impact key areas such as meadows, remove cover for prey species, or limit the implementation of prescribed natural fire may impact MSO population viability.

The entire East Clear Creek watershed has been surveyed for owls at least twice, with some areas surveyed up to five times. Surveys took place between 1990 and 2002, and 21 territories have been delineated either partially or wholly within the allotment. Mexican spotted owl PACs makeup about 10,400 acres of the allotment. An additional 9,000 acres of mixed conifer on steep slopes provide additional protected habitat. Approximately 3,500 acres of restricted mixed conifer and pine-oak habitat are designated as target-threshold habitat (i.e., areas to be managed toward nesting/roosting habitat conditions), and another 8,000 acres are considered other restricted habitat. The remaining 40,000 acres of the allotment are ponderosa pine forest (an unrestricted habitat). Table 2 describes the PACs with acres, percent of each PAC within the Buck Springs Allotment, percent of each PAC that is accessible to livestock within this allotment (and within all allotments), and the Buck Springs pastures that encompass each PAC.

Table 2. Mexican spotted owl PACs within the Buck Springs Allotment.

PAC Number	PAC Name	PAC Acres	% PAC in Allotment	% of PAC Grazed (*)	Pastures in PAC
040701	Lockwood Draw	632	100	15	North
040702	Quayle Springs	634	100	20	North, North Pinchot
040703	Hart Point	612	80	40	North Pinchot
040704	General Springs	628	100	30	North Pinchot North Battleground
040708	Weimer	623	20	10	North
040710	North Miller	637	100	30	McCarty
040711	Mid Miller	600	100	85	North Battleground
040712	Rock Crossing	607	100	20	North Battleground

PAC Number	PAC Name	PAC Acres	% PAC in Allotment	% of PAC Grazed (*)	Pastures in PAC
040718	Leon-Limestone	605	25	15 (50)	Dines, North
040719	Dane-Barber	610	100	15	North North McClintock N + S Pinchot
040722	Pinchot	617	100	15	N + S Pinchot Aspen Horse South Battleground
040723	Yeager	608	100	70	North, Horse
040724	McCarty	603	95	60	McCarty
040730	Rock Crossing W	600	100	15	North Battleground
040731	Clear Creek	622	100	20	McCarty
040733	Houston	630	100	80	North Pinchot
040734	Aqueduct	700	100	100	South Battleground
040735	Turkey	623	100	80	North Battleground
040736	Kinder	624	45	20 (60)	North
040738	Bear	700	100	10	South Pinchot
040415	East Miller	665	60	50 (85)	N + S Battleground

* Numbers in parentheses ( ) indicate total percent of PAC grazed on all allotments.

The Forest Service states that all of the PACs within the Buck Springs Allotment have some range capacity. All PACs within the allotment have some percentage of steep slopes that livestock are not likely to use. This percentage varies by PAC with some PACs (040701 and 040702) having a high percentage of steep slopes, and others (040733 and 040734) being nearly 100% accessible by livestock. In general, PACs in this allotment are densely forested and have high canopy cover which limits forage production and does not attract cattle. Small openings in PACs can support high vegetative species diversity and abundance.

B. Factors affecting species' environment within the action area

Actions within the project area that affect MSO include both domestic and wild ungulate grazing, recreation, fuel reduction treatments, and other associated actions. These activities have the potential to reduce the quality of MSO nesting, roosting, and foraging habitat, and may cause disturbance during the breeding season. Livestock grazing has been ongoing throughout the action area for many years and elk populations on the allotment are thought to have a large effect on the availability of grass cover for prey species. Recreation impacts are increasing on the District and on the allotment, especially in meadow and riparian areas. The Forest Service states in the BAE that owl survey crews report that owls in the Rock Crossing PAC (#040712), which is located in a heavily used recreation area, are much more erratic in their movement patterns and behavior. With increased recreation across the Forest, there may be other PACs adversely affected by recreationists. Fuels reduction treatments, though critical to reducing the risk of catastrophic wildfire, can have short-term adverse affects to MSO through habitat modification and disturbance.

Chiricahua Leopard Frog

A. Status of the species within the action area

The range of the Chiricahua leopard frog in Arizona can be divided into two general areas: (1) the southeastern part of the state and (2) centered along the Mogollon Rim. Populations occurring on the Blue Ridge and Long Valley Ranger Districts of the Coconino National Forest occur within the northern portion of the species range. Threats to the species occur throughout its range, but the populations above the Mogollon Rim in Arizona appear to have relatively poor persistence (J. Rorabaugh, USFWS, pers. comm. 2001).

East Clear Creek and several of its major tributaries provide historical habitat that would be considered likely to be inhabitable by the Chiricahua leopard frog if not for the presence of non-native fish and crayfish. Though most stock tanks are devoid of riparian and aquatic vegetation, a few are vegetated and provide potential habitat. Historical locations within the East Clear Creek watershed include Mack's Crossing in 1971 (T14N, R12.5E, Section 8), East Clear Creek at FS 96 in 1972 (T14N, R12E, Section 35), Jones Crossing in 1970 (T13N, R10E, Section 10), Buck Springs Canyon in 1984 (T12N, R12E), Blue Ridge Reservoir in 1972 (T13/14N, R11E), Buck Springs Tank in 1984 (T13N, R12E, Section 31), and Clints Well in 1970 (T14N, R10E, Section 31). Only three of these historical locations are within the allotment: East Clear Creek at FS 96, Buck Springs Tank, and Jones Crossing.

Surveys were conducted by the AGFD in 1992 in historical sites as well as Dines Tank in Leonard Canyon, Lower Buck Spring, Knoll Lake, Lost Lake, and Dude Lake. Several other locations were surveyed in East Clear Creek. These locations were re-surveyed in 1993, along with other locations in Merritt Draw, Dick Hart Draw, and Dane Canyon. Knoll Lake, the Blue Ridge Reservoir spillway, Potato Lake, and Poverty Draw were surveyed again in 1995. No Chiricahua leopard frogs were located. In addition to these specific surveys, fish crews surveyed many of the streams in the East Clear Creek watershed between 1998 and 2001. Crews were trained to identify sensitive reptiles and amphibians, and instructed to look for these species during fish and fish habitat surveys. No ranid frogs were observed during such surveys. The nearest intact population of Chiricahua leopard frogs is located in the Mud Tanks area, over 20 miles from the project area.

B. Factors affecting species' environment within the action area

Actions within the project area that affect Chiricahua leopard frogs include ongoing livestock grazing and other related actions, drought, increased elk populations, recreation, roads, and the introductions of fish and other aquatic organisms. Current drought conditions are resulting in the loss of riparian and stock tank habitat for the leopard frog on the Coconino National Forest and throughout its range. Elk populations on the allotment contribute to ungulate impacts in riparian habitat and may impede the recovery of riparian habitat when livestock are removed. Recreation use is increasing rapidly within the watershed. Campers and off-road vehicles cause soil compaction, reduce riparian vegetation, and reduced infiltration. Non-native fish, frogs, and crayfish prey on eggs, tadpoles, and occasionally adult leopard frogs. Crayfish may also affect the habitat by impacting aquatic and riparian vegetation along streams, potentially destroying habitat for the Chiricahua leopard frog. Roads may adversely impact riparian habitat directly and indirectly (alteration of streamflow, timing of peak flows, increased sedimentation, etc.), and provide access to people which facilitates the introduction of non-native fish and crayfish.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

The Buck Springs Range Allotment Management Plan proposes the total exclusion of thousands of acres from livestock grazing in the southeastern portion of the allotment. In doing so, 400 acres of headwater meadows will not be grazed by livestock. The Forest Service anticipates that this will result in improved meadow habitat conditions that will equate to improved baseflows downstream and improved spinedace habitat. The proposed allotment management plan specifies a rest-rotation system of management allowing for growing season rest on half of the allotment every year with fewer permitted livestock.

Little Colorado Spinedace and Critical Habitat

Analysis of the effects of livestock grazing on fish and wildlife species and their habitats requires looking at long-term, incremental changes in watershed functions, riparian and aquatic communities, and stream channel morphology. However, extrapolations of general hydrologic and biological principles and site-specific research data provide a large body of evidence linking degradation of watersheds, stream channels, aquatic and riparian communities, and fish habitat and populations in western North America to past grazing and some current grazing management (Leopold 1924, Leopold 1951, York and Dick-Preddie 1969, Hastings and Turner 1980, Dobyns

1981, Kauffman and Krueger 1984, Skovlin 1984, Kinch 1989, Chaney *et al*. 1990, Platts 1990, Armour *et al*. 1991, Bahre 1991, Meehan 1991, Fleischner 1994).

The proposed action will exclude cattle from high-elevation, headwater meadows in the southern portion of the allotment and implementation of the rest-rotation grazing system, wherein the remaining pastures are rested every other year, will aid in repairing watershed condition throughout the allotment. However, it is doubtful that any grazing scheme will improve a local hydrologic circumstance over that found under ungrazed condtitions (Platts 1990, Belsky *et al.* 1999). Effects to the East Clear Creek watershed from the proposed livestock grazing and its management on the Buck Springs Allotment may occur through five mechanisms: (1) watershed alteration; (2) physical destruction and alteration of streambanks, stream channels, water column, and the riparian vegetation community; (3) alteration of the faunal community; (4) effects from non-grazing and structural elements; and (5) direct effects to spinedace from livestock accessing occupied habitat. These mechanisms may have varying effects on spinedace and critical habitat.

(1) Watershed Alteration

Watershed changes due to grazing are difficult to document due to their long-term, incremental nature; the time lag and geographic distance between cause and effect; and the numerous confounding variables. With the information available, it is not possible to differentiate watershed alteration effects caused by current livestock grazing on the Buck Springs Allotment from those caused by past grazing, current grazing on adjacent allotments, roads, or other watershed effects. Despite this, the relationship between livestock grazing in a watershed and effects to river systems is widely recognized and documented (Leopold 1946, Blackburn 1984, Skovlin 1984, Chaney *et al.* 1990, Platts 1990, Bahre 1991, Meehan 1991, Fleischner 1994, Myers and Swanson 1995). Although watershed effects vary depending upon the number and type of livestock, the length and season of use, and the type of grazing management, the mechanisms remain the same and the effects vary only in extent of area and severity (Blackburn 1984, Johnson 1992). The proposed action will reduce the number of permitted livestock and the number of acres grazed. The rest-rotation system proposed for the Buck Springs Allotment will also allow for pastures to be rested every other year. This will minimize effects to the watershed from livestock grazing and improve habitat for aquatic species.

Livestock grazing may alter the vegetative composition of the watershed (Martin 1975, Savory 1988, Vallentine 1990, Popolizio *et al.* 1994). It may cause soil compaction and erosion, alter soil chemistry, and cause loss of cryptobiotic soil crusts (Harper and Marble 1988, Marrs *et al.* 1989, Orodho *et al.* 1990, Schlesinger *et al.* 1990, Bahre 1991). Cumulatively, these alterations contribute to increased erosion and sediment input into streams (Johnson 1992, Weltz and Wood 1994). They also contribute to changes in infiltration and runoff patterns, thus increasing the volume of flood flows while decreasing their duration, and decreasing the volume of low flows while increasing their duration (Brown *et al.* 1974, Gifford and Hawkins 1978, Johnson 1992). Groundwater levels may decline and surface flow sources may decrease or cease (Chaney *et al.* 1990, Elmore 1992). Development of livestock waters may alter surface flows by impoundment, spring capture, or runoff capture.

Headwater meadow protection will be improved through exclusion of livestock grazing on the southeastern portion of the allotment. Elimination of grazing within these pastures will contribute to improving the condition of headwater meadows and nonfunctional riparian stream courses within the South McClintock and Knolls pastures. However, eliminating livestock grazing reduces only one of the impacts that cumulatively affect the headwater meadows and riparian drainages. Elk will still have access to these areas and livestock/elk interactions in the northern pastures may increase the number of elk within the excluded areas due to competition for forage.

Upland headwater areas within the southwestern and western portion of the allotment will be protected by a temporary electric fence when livestock are in the pasture. This will result in protection of all headwater meadows from livestock grazing (see April 24, 2003, Fores Service comments on second draft biological opinion).

(2) Physical alteration of Streambanks, Stream Channels, Water Column, and Riparian Vegetation Community

The majority of riparian areas within the Buck Springs Allotment are excluded from livestock use through fencing and topographic features. We acknowledge and support the efforts that have and will go towards keeping livestock out of riparian habitat. However, because some areas remain accessible to livestock (Yeager Canyon, portions of Miller Canyon, General Springs, Houston Draw, Dane Canyon, Dick Hart Draw, and Bear Canyon), it is necessary to discuss potential adverse effects that could occur from repeated livestock access to these areas.

The potential adverse effects of grazing on streambanks include the shearing or sloughing of streambank soils either by hoof or head action; elimination of streambank vegetation; erosion of streambanks following exposure to water, ice, or wind due to a loss of vegetative cover; and an increased streambank angle which increases water width and decreases water depth. Damage can begin to occur almost immediately upon entry of livestock onto the streambanks, and use of the riparian zones may be highest immediately following entry of cattle into a pasture (Platts and Nelson 1985, Goodman *et al.* 1989). Vegetation and streambank recovery from long rest periods may be lost within a short period following grazing reentry (Duff 1979). Bank configuration, soil type, and soil moisture content influence the amount of damage, with moist soil being more vulnerable (Marlow and Pogacnik 1985, Platts 1990). Although not quantifiable, some of these effects can be anticipated under the proposed action.

Following streambank alteration, potential effects to the channel itself can include changes in channel morphology and altered sediment transport processes (Platts 1990). Within the stream itself, there can be changes to pools, riffles, runs, and the distribution of backwater areas, a reduction in cover for fishes, elevated water temperatures, changes in nutrient levels, and increased sedimentation (Platts 1990, Belsky *et al.* 1999).

Effects of livestock grazing in riparian habitat has been summarized by many authors (Szaro and Pase 1983, Warren and Anderson 1987, Platts 1990, Schulz and Leininger 1990, Schulz and Leininger 1991, Stromberg 1993). Some of these changes in the structure, function, and composition of the riparian community may occur within the East Clear Creek watershed. Species diversity and structural diversity may be substantially reduced and non-native species may be introduced through spread in cattle feces. Reduction in riparian vegetation quantity and health, plus shifts from deep-rooted to shallow-rooted vegetation contribute to bank destabilization and collapse and production of fine sediment (Meehan 1991). Loss of riparian shade results in increased fluctuation in water temperatures with higher summer and lower winter temperatures (Karr and Schlosser 1977, Platts and Nelson 1989). Litter is reduced by trampling and churning into the soil thus reducing cover for soil, plants, and wildlife (Schulz and Leininger 1990). The capacity of the riparian vegetation to filter sediment and pollutants to prevent their entry into the river and to build streambanks is reduced (Lowrance *et al*. 1984, Elmore 1992). Channel erosion in the form of downcutting or lateral expansion may result (Heede and Rinne 1990, USBLM 1990).

Changes to the water column within the stream can be many and varied. Water-column alterations can be caused by changes in the magnitude and timing of organic and inorganic energy inputs to the stream; increases in fecal contamination; changes in water temperatures due to removal of vegetation; changes in water column morphology, including increases in stream width and decreases in stream depth, as well as reduction of stream shore water depth; changes in timing and magnitude of streamflow events from changes in watershed vegetative cover; and increases in stream temperature (Platts 1990, Fleischner 1994).

The general effects of upland grazing on riparian systems have been discussed above. To generate and maintain riparian habitat, a healthy watershed (uplands, tributaries, ranges, etc.) is a key component (Elmore and Kauffman 1994, Briggs 1996). Elmore and Kauffman (1994) note that "simply excluding the riparian area (from grazing) does not address the needs of upland vegetation or the overall condition of the watershed. Unless a landscape-level approach is taken, important ecological linkages between the uplands and aquatic systems can not be restored and riparian recovery will be limited." Continuing to graze in uplands may continue to impact spinedace habitat, and may result in unnatural flooding and lack of water retention within the system, delaying recovery of spinedace populations. However, we also acknowledge that Alternative G will minimize the effects detailed above and will maintain or improve satisfactory upland conditions.

The drainages where livestock can access the watercourses are either currently occupied (Yeager Canyon and Dane Canyon) or potential habitat that may be occupied in the future following supplemental stocking of spinedace. However, though supplemental stocking may increase the number of drainages where spinedace and livestock may interact, the benefits of increasing the number of spinedace within the watershed in conjunction with the proposed action should aid in our recovery of the species. Fence maintenance is imperative to improving the watershed and reducing direct impacts to spinedace and potentially leopard frogs, improving habitat for both species, and reducing impacts to spinedace critical habitat.

Though there is no direct access to critical habitat by livestock (except for crossing East Clear Creek once every other year), the allotment pasture configuration does provide livestock access to perennial and intermittent riparian reaches that flow into designated spinedace critical habitat. This will occur in the following pastures and locations: North McClintock - Dane Canyon; McCarty - Miller Canyon; South Pinchot - Merritt Draw; North Pinchot - Houston Draw, Dick Hart Draw; North - Yeager Canyon; South Battleground - Crackerbox Canyon; Moonshine - Yeager Canyon; and North Battleground - Miller Canyon, Crackerbox Canyon. Occupied spinedace habitat is also affected by cattle access to perennial and intermittent riparian reaches within the allotment. This will occur in the following pastures and locations: North McClintock - Dane Canyon; North - Yeager Canyon, Limestone Canyon, and other ephemeral drainages; and Dines - Limestone Canyon. Properly functioning tributary riparian vegetation and streambank condition, including intermittent and ephemeral channels, form important buffers between upland impacts and the mainstem (Erman *et al.* 1977, Mahoney and Erman 1981, Osborne and Kovacic 1993). Deteriorated riparian and streambank conditions cannot adequately perform this buffering function. Though due to past management, the unsatisfactory conditions of the headwater meadows throughout the allotment are an example of how the poor condition of streambanks and riparian vegetation may be contributing to deleterious effects within the East Clear Creek watershed. The proposed action will aid in repairing these headwater meadows through exclusion of livestock grazing.

(3) Alteration of the Faunal Community

Research indicates that livestock use of the riparian corridor may cause changes in species composition and community structure of the aquatic and riparian fauna, in addition to floral changes already addressed. The aquatic invertebrate community may change from its baseline because of altered stream channel characteristics, because of sediment deposition, or because of nutrient enrichment (Rinne 1988, Meehan 1991, Li *et al.* 1994). This change in the food base of many aquatic vertebrates, particularly fish, may contribute to loss of or change in the vertebrate community. In addition, the structure and diversity of the fish community may shift due to changes in availability and suitability of habitat types (Storch 1979, Van Velson 1979). Livestock grazing can lead to loss of aquatic habitat complexity, thus reducing diversity of habitat types available and altering fish communities (Li *et al.* 1987). However, the removal of livestock from most riparian areas as proposed in Alternative G should improve current conditions throughout the watershed, resulting in increases in aquatic habitat complexity rather than losses.

(4) Effects from Grazing-related Structural Elements

The Forest Service stated at our August 23, 2002, meeting that roads throughout the allotment are maintained only for logging and recreation and will never be maintained for the permittee's access on this allotment. However, these roads will be used by the permittee and are of concern since they are often contributors of sediment to stream courses and are part of the current landscape. Fences are of concern because where they occur near streams and/or in floodplains, livestock may trail along fences and create a potential source of sediment and assist in the creation of erosion channels and can negatively effect the channel banks. The Forest Service believes that this is not a common occurrence across the Buck Springs Allotment (C. Taylor, pers. comm. 2002). The continued use and maintenance of existing waterlots and stock tanks within the allotment increases the potential for the unauthorized stocking of non-native fish, bullfrogs, and crayfish. Flood events may then cause breaches in these water developments and allow non-native fish and other aquatic species to enter tributaries and major waterways.

(5) Direct/Indirect Effects from Livestock Access to Occupied Habitat

The effects of animals wading in stream courses are of particular concern in the intermittent reaches of streams where spinedace could be found isolated in small pools. Between the period of spring runoff and summer monsoons, spinedace are often stranded in pools ranging in size from several thousand square feet to just a few square feet. As these habitats begin to dry, spinedace become more susceptible to disturbances and predation, and livestock drinking from and trampling the pools can eliminate this habitat. We have not documented livestock trampling fish and/or fish eggs in the pools that spinedace inhabit on the Buck Springs Allotment. However, the very nature of these small pockets of habitat allows us to believe that the potential exists for livestock to harm and/or harass spinedace in pool situations.

Documentation of livestock directly impacting fish or fish eggs is mostly through personal observation, and not very well documented in the literature. However, there are a few citations available that have documented livestock and humans trampling fish and/or fish eggs. Minckley (1973) noted that Sonoran topminnow (*Poeciliopsis occidentalis*) were eliminated from Astin Spring by livestock trampling. A study that examined the effects of anglers on trout egg and fry survival found that wading anglers had detrimental effects on trout redds through trampling (Roberts and White 1992). The authors also speculated that livestock trampling may have similar adverse effects. In California, an entire population of Owens pupfish (*Cyprinodon radiosus*) (a few hundred individuals) were rescued from a drying site where they were stranded in cattle hoofprints (Miller and Pister 1971). In addition, documentation from a Bonneville cutthroat trout (*Oncorhynchus clarki utah*) project on the Goshute Reservation (UT/NV west desert, south of Wendover, UT) stated that livestock destroyed an estimated 50% of the spawning redds within an exclosure due to trampling and mucking around in the streambed (J. Stefferud, pers. comm. 2003).

There is also the potential for livestock to drink occupied spinedace habitat dry, under certain conditions. According to Vallentine (1990), the Forest Service (USFS 1969) states that cattle will drink 12 to 15 gallons per day per individual and the University of Nebraska Extension Service (http://www.ianr.unl.edu/pubs/Beef/g372.htm), estimates that at an average maximum daily temperature of 90 degrees Fahrenheit an individual animal (bull, growing cattle, finishing cattle, nursing calves, heifers) may use from 10 to 23 gallons of water per day. For the following example, we will use a range of 10 (low) to 23 gallons (high) of water per day as an estimate of individual cattle water usage. If we assume that, in an isolated pool, subflow is equal to evaporation and transpiration (so that the volume remains constant), then we may assume the following:

SMALL POOL Pool size is 3 feet X 2 feet X 0.5 feet average depth (approximately 22 gallons)			
Gallons per day	Approximate number of cattle that could drink pool dry in 1 day	Approximate number of cattle that could drink pool dry in 2 days	Approximate number of cattle that could drink pool dry in 3 days
10	2	1	0.75
23	1	0.5	0.3

MEDIUM POOL Pool size is 10 feet X 5 feet X 1 foot average depth (approximately 373 gallons)			
Gallons per day	Approximate number of cattle that could drink pool dry in 1 day	Approximate number of cattle that could drink pool dry in 2 days	Approximate number of cattle that could drink pool dry in 3 days
10	37	19	12
23	16	8	5

LARGE POOL Pool size is 20 feet X 10 feet X 2 feet average depth (approximately 2,985 gallons)			
Gallons per day	Approximate number of cattle that could drink pool dry in 1 day	Approximate number of cattle that could drink pool dry in 2 days	Approximate number of cattle that could drink pool dry in 3 days
10	299	159	100
23	130	65	43

As an example, on the Buck Springs Allotment there may be upwards of 243 cows with calves in the Buck Springs (East) Unit from mid-May to mid-October. If we use the low and high water usage per day per individual, the information in the following table is an estimate of how many pools these cattle could impact within the East Unit. Again, we are assuming that subflow equals transpiration plus evaporation, for a constant pool volume.

BUCK SPRINGS ALLOTMENT, EAST UNIT, RIPARIAN PASTURE WATER USAGE ESTIMATES						
Head and class	Season and length	Gallons/ day/ individual	Gallons of water consumed per day	Approximate number of pools of water consumed/day	Total gallons of water consumed per season	Approximate number of pools of water consumed over the grazing season
243 cow/calf	mid-May to mid-October (153 days)	10	2,430	110 small or 6.5 medium or 0.8 large	371,790	16,900 small or 997 medium or 125 large
		23	5,589	254 small or 15 medium or 1.9 large	855,117	38,869 small or 2,293 medium or 286 large

This example does not imply that we believe livestock will access and drink every pool in the allotment dry. We realize that cattle will have access to stock tanks for water and that water usage in riparian areas will most likely be limited due to the proposed management plan. However, it should be clear that it is not impossible for a small number of cattle to deplete a small pool very quickly (depending upon temperature, time in riparian pool, etc.) and indirectly kill any spinedace that may occupy the pool. This may be especially true during drought conditions.

Livestock are able to access currently occupied habitat in Yeager and Dane Canyons (Dane III pool located in the southeast corner of North McClintock Pasture is occupied by spinedace). Gap and wing fences along FR96 will discourage cattle from entering Yeager Canyon near the occupied habitat and a drift fence will aid in protecting the occupied reach of Dane Canyon. However, these measures do not preclude cattle from entering the occupied spinedace habitat and directly impacting spinedace. Livestock will also have access to Yeager Canyon while in the Moonshine Pasture. Currently, Yeager and Dane Canyons are the only occupied habitats accessible to livestock. However, as fish are stocked in the allotment the potential for direct effects to spinedace will increase. It is our hope, however, that as more spinedace are stocked throughout the allotment and our knowledge of important drought refugia increases, our flexibility in working with the Forest Service and the permittee to manage these areas will increase.

The proposed action would help to reduce direct effects to spinedace and critical habitat through pasture fencing. Proposed fencing above Leonard Canyon in the Dines and Knolls Pastures would prevent livestock access to Leonard Canyon, both upstream and downstream of Dines Tank. Fencing north of Buck Springs Canyon will reduce the amount of area grazed in the Knolls Pasture and eliminate access to spinedace populations in Leonard and West Leonard Canyon, above Dines Tank. Proposed fencing along East Clear Creek in the McCarty pasture will restrict livestock grazing to the south and east of the creek and protect those reaches of critical habitat from direct impacts. The exclusion of Aspen Horse Pasture from livestock use would supplement protection to the riparian habitat and potential spinedace stocking sites in Houston Draw. Gap fencing in Yeager Canyon will aid in restricting livestock from the drainage and protect occupied habitat. Fencing McClintock Meadow and construction of a drift fence in Dane Canyon in the North McClintock pasture will aid in restricting livestock from these sensitive areas. The BAE states that the deeply incised, steep-walled canyons that define the boundaries of most northern pastures (North, North Pinchot, North Battleground Pastures) prevent livestock access to sensitive riparian drainages and spinedace critical habitat. Additional protective measures are afforded through fences along critical drainages, meadows, and springs. Stocking spinedace into three drainages will improve the status of the species in the action area and aid in recovery of the species.

Livestock movement could necessitate the need to cross eight drainages. Crossing these drainages has the potential to directly impact riparian conditions at the crossing and downstream; potentially degrading spinedace habitat. Severity of impacts will depend on trail location, stream channel substrate, drainage confinement, and livestock control. The move between the McCarty and Jumbo Pastures is the only crossing through spinedace critical habitat. This crossing will not be used if watered pools are present within a reasonable distance of the crossing and are accessible to livestock. As stated in the proposed action, the fisheries biologist will work with the permittee and us to minimize effects to spinedace at these crossings.

No adverse effects are anticipated from the 200 acre tree thinning portion of this project.

In summary, with the information available, it is not possible to differentiate watershed alteration effects caused by current livestock grazing on the Buck Springs Allotment from those caused by past grazing, current elk use, roads, or other human activities. However, the following should be noted:

(1) The overall condition of the upland vegetation and watershed condition is considered by the Forest Service to be generally satisfactory in the uplands and side slopes, though there are "hot spots"that continue to be impacted by ungulate grazing (D. Fleishman and M. Whitney, pers comm. 2002).

(2) Conservation measures included in the proposed action will help offset some adverse effects to the species. However, livestock are known to adversely impact vegetation condition, erosion levels, soil compaction, streambank stability, and stream channel characteristics (see preceding and following discussion) and are likely to continue contributing to these conditions on the allotment in the future. The proposed action should minimize these impacts; however, we do expect some adverse effects from continued livestock grazing on the allotment.

(3) Despite improvements in excluding livestock from direct access to occupied habitat, some access will continue.

The BAE contains a summary of the types of effects to aquatic and riparian systems that can be attributed to ungulate grazing. The Hydro Science (1993) report addressed the effect that past overuse of the available resources by livestock (and possibly elk) has had on the riparian and aquatic habitats within and affected by the Buck Springs Allotment. We recognize that the Coconino National Forest will work to improve range management and range condition within this allotment through modification of the allotment management plan and through implementation of the *East Clear Creek Watershed Recovery Strategy for the Little Colorado Spinedace and other Riparian Species* (USDA 1999). However, in areas that have been significantly affected and altered by past over-use, even allowing well-managed use to continue may impede recovery in the system. In summary, though we recognize and acknowledge the efforts to minimize impacts throughout the allotment, there may be adverse impacts that directly affect spinedace and indirectly affect spinedace and critical habitat.

<u>Mexican Spotted Owl</u>

There are 21 PACs located wholly or partially within the Buck Springs Allotment and the entire East Clear Creek watershed has been surveyed at least twice, with some areas surveyed up to five times. The Recovery Plan summarizes the effects of grazing to spotted owls in four broad categories: (1) altered prey availability; (2) altered susceptibility to fire; (3) degradation of riparian plant communities; and (4) impaired ability of plant communities to develop into spotted owl habitat.

To minimize these impacts, the Recovery Plan recommends that grazing by livestock and wildlife be monitored in key areas, including riparian areas, meadows, and oak types. The Recovery Plan further recommends implementing and enforcing grazing utilization standards that would attain good to excellent range conditions within the key grazing areas. To do this, the Recovery Plan recommends incorporating allowable use levels based on current range condition, key species, and the type of grazing system. The Recovery Plan further recommends implementing management strategies that will restore good conditions to degraded riparian communities as soon as possible. Strategies to accomplish this may include reductions in grazing levels and increased numbers of exclosures, complete rest, as required, limited winter use, or other methods.

With respect to prey base, Belsky and Blumenthal (1997) note that livestock grazing can reduce the amount of biomass available to be converted into litter, and therefore increase the proportion of bare ground. The Recovery Plan notes for the Upper Gila Mountain RU that:

> “Overgrazing is suspected to be detrimental in some areas and can affect both habitat structure and the prey base. Effects on the prey base are difficult to quantify, but removal of herbaceous vegetation can reduce both food and cover available to small mammals (Ward and Block 1995). This may be especially true with respect to voles, which are often associated with dense grass cover. Direct effects on habitat are obvious in some places, particularly with respect to browsing on Gambel oak (*Quercus gambelii*). In some areas, oak

> is regenerating well but unable to grow beyond the sapling stage because of this browsing.....We do not attribute these effects solely to livestock. Forage resources are shared by livestock and wild ungulates (USDI 1995a)."

The effects of livestock and wild ungulate grazing on the habitat of spotted owl prey species is a complex issue. Impacts can vary according to grazing species; degree of use, including numbers of grazers, grazing intensity, grazing frequency, and timing of grazing; habitat type and structure; and plant or prey species composition (USDI 1995a). Livestock can affect small mammals directly by trampling burrows, compacting soil, and competing for food, or indirectly by altering the structure or species composition of the vegetation in a manner that influences habitat selection by small mammals. Vegetation cover is often greatly reduced on grazed relative to ungrazed areas, and vegetation typically appears more dense in ungrazed areas. In one study, the total abundance of small mammals differed significantly between grazed and ungrazed plots, with the mean abundance of small mammals per census about 50 percent higher on plots from which livestock were excluded (Hayward *et al*. 1997). Bock and Bock (1994) reported that small mammal species that prefer habitats with substantial ground cover were more abundant on an ungrazed site, whereas species that prefer open habitats were more abundant on a grazed site in their study area in southern Arizona.

Most of the owl PACs within the allotment are located in the steep canyons of the northern pastures, and are fairly inaccessible to livestock. The elimination of livestock grazing from the four southern pastures would reduce the amount of area grazed in three PACs (Pinchot 040722, Bear 040738, and Dane-Barber 040719). The implementation of rest-rotation would reduce the amount of area grazed in any one year on three other PACs and allow a year of rest from grazing for every year grazed on 18 PACs. This will reduce impact to prey species and remove disturbance from livestock or livestock related activities every other year.

The Forest Service states that in general, PACs and protected habitats would receive light utilization rates because of high canopy closures, multistoried conditions, and high basal areas of woody species that limit understory production; and because of the association these areas have with steep slopes, cliffs, and distance from large meadows. Portions of seven PACs would be grazed in the Buck Springs Unit and portions of 16 PACs would be grazed in the Battleground Unit. Grazing in 12 PACs would occur on 10% to 40% of the PAC, while eight PACs would have 60% to 85% of their area grazed. One PAC, Aqueduct (040734) has the potential for grazing to occur on 100% of the designated area. The BAE states that utilization levels of 35% in PACs (some grazed every other year), will allow for adequate cover and food for prey species. Utilization rates will be monitored during and after use by livestock, and at the end of the grazing season. Livestock will be moved if overall pasture levels are above acceptable utilization levels.

We are concerned about the potential for grazing to occur over 80% to 100% of a PAC and the potential effects to MSO habitat. Based on existing data on the foraging behavior of MSOs, a PAC includes (on average) only 75% of a bird's foraging range. Therefore, prey species abundance and habitat suitability on and adjacent to a PAC is important in assessing effects to the owl from livestock grazing activities. Currently the ecological condition of the range with respect to MSO and their prey species is unknown, though some key areas in poor condition. No major meadows (>5 acres) are within known PACs. However, these key areas (small, grassy openings) may receive heavy utilization, and may influence prey habitat.

With respect to altered susceptibility to fire, Belsky and Blumenthal (1997) note that livestock grazing alters forest dynamics by reducing the biomass and density of understory grasses and sedges, which otherwise outcompete conifer seedlings and prevent dense tree recruitment, and by reducing the abundance of fine fuels, which formerly carried low-intensity fires through forests. Fire susceptibility is not likely to change during the life of this project. The BAE states that under current conditions, grasses and forbs, which are most likely impacted by grazing, are not limiting the implementation of prescribed fire.

Belsky and Blumenthal (1997) note that grazing can lead to compacted soils, which results in increased runoff and decreased water storage; and can also lead to increased erosion and runoff due to reduced plant cover and compacted soils. Both of these factors, which lead to the degeneration of riparian plant communities and impair the ability of plant communities to develop into spotted owl habitat, are expected to continue during the life of the project.

Related activities that may affect spotted owls or their habitat include construction of fences, road closures, and activities that facilitate the concentration of cattle (trailing, gathering, and placement of waters, salt, and nutrient supplements). The allotment management plan proposes 1.5 miles of new fencing within PACs, and a road closure totaling 0.2 miles within a PAC. As stated above, construction activities will not occur during the breeding season (March 1 to August 31) unless non-nesting has been determined, and activities that promote the concentration of livestock (e.g., salting or use of supplements) will not occur within PACs.

No adverse effects are anticipated from the 200 acre tree thinning portion of this project.

<u>Chiricahua Leopard Frog</u>

The Forest Service has not conducted any systematic evaluation of habitat in the riparian systems within the Buck Springs Allotment. The Draft Environmental Impact Statement states that there are 115 tanks, 29 borrow pits, 17 springs, and 10 backhoe springs within the allotment; however, not all areas have been assessed for Chiricahua leopard frog occupancy. Because of the lack of surveys, the direct effects of livestock grazing within riparian areas and stock tanks or springs cannot be fully assessed.

Maintenance of viable populations of Chiricahua leopard frogs is thought to be compatible with well-managed livestock grazing. Grazing occurs in most of the habitats occupied by this frog. For instance, a large population of Chiricahua leopard frogs coexists with cattle and horses on the Tularosa River, New Mexico (Randy Jennings, Western New Mexico University, pers. comm. 1995). Effects of grazing on Chiricahua leopard frog habitat include both creation of habitat and loss and degradation of habitats. Construction of tanks for livestock has created important leopard frog habitat, and in some cases has replaced, destroyed, or altered natural wetland habitats (Sredl and Saylor 1998). Sixty-three percent of extant Chiricahua leopard frog localities in Arizona are stock tanks, versus only 35% of extirpated localities (Sredl and Saylor 1998), suggesting that Arizona population of this species have fared better in stock tanks than in natural habitats. Stock tanks provide small patches of habitat, which are often dynamic and subject to drying and elimination of frog populations. However, Sredl and Saylor (1998) also found that stock tanks are occupied less frequently by non-native predators (with the exception of bullfrogs) than natural sites.

Adverse effects to the Chiricahua leopard frog and its habitat as a result of grazing on the Buck Springs Range Allotment may occur under certain circumstances. These effects include facilitating dispersal of non-native predators; trampling of egg masses, tadpoles, and frogs; deterioration of watersheds; erosion and/or siltation of stream courses; elimination of undercut banks that provide cover for frogs; loss of wetland and riparian vegetation and backwater pools; and spread of disease (USFWS 2000). Juvenile and adult frogs can probably avoid trampling when they are active. However, leopard frogs are known to hibernate on the bottom of ponds (Harding 1997), where they may be subject to trampling during the winter months. Though this allotment is used only May through October, drought can also cause frogs to aestivate as the water recedes. Cattle can remove bankline vegetation cover that provides escape cover for frogs and a source of insect prey. However, dense shoreline or emergent vegetation in the absence of grazing may favor some predators, such as garter snakes (*Thamnophis* spp.), and the frogs may benefit from some open ground for basking and foraging.

Chytrid fungus can survive in wet or muddy environments, and could conceivably be spread by livestock carrying mud on their hooves and moving among frog habitats. The disease could also be spread by ranch hands working at an infected tank or aquatic site and then traveling to another site with contaminated footwear and equipment from mud or water at the first site. Chytrids could be carried inadvertently in mud clinging to wheel wells or tires, or on shovels, boots, or other equipment. Chytrids cannot survive complete drying, thus, if equipment is allowed to thoroughly dry, the likelihood of disease transmission is much reduced. Bleach or other disinfectants can also be used to kill chytrids (Longcore 2000). Chytrids, if not already present, could immigrate to the allotment naturally via frogs or other animals. Chytridiomycosis is not known to occur within the Buck Springs Allotment, but it is known to occur approximately 12 miles to the west at New Tank (T13N, R8E, Section 10) and Twenty-seven Mile Lake (T13N, R8E, Section 23). Thus, if chytrids are not already present, there may be a high probability of immigration to the action area.

Road use and tank maintenance needed for the grazing program could provide fishing opportunities and facilitate access by anglers, hunters, or other recreationists, who may inadvertently introduce chytrids or may intentionally introduce non-native predators for angling or other purposes. Chytrids could be moved among aquatic sites during intentional introductions of fish or other aquatic organisms. Anglers commonly move fish, tiger salamanders, and crayfish among tanks and other aquatic sites to establish a fishery or a source of bait, or in some cases bait is released at an aquatic site during angling. Water, salamanders, or perhaps fish and crayfish could all be carriers of chytrids. In addition to possibly introducing chytrids, such activities would also facilitate introduction on non-native predators with which the Chiricahua leopard frog cannot coexist.

Stock tank maintenance typically occurs when tanks are dry or nearly dry. At that time, dams could be repaired or silt could be dredged out of the tanks. During drought, many leopard frogs probably disperse from drying tanks or are killed by predators as waters recede. However, some frogs persist in cracks in the mud or pond bottoms (M. Sredl, Arizona Game and Fish Department, pers. comm. 1999) or in clumps in emergent vegetation. Halfmoon Tank in the Dragoon Mountains went dry during June 1996 for 30 days or more. On July 21, 1996, 29 frogs of several different size classes were counted after the tank refilled with precipitation from the summer monsoons (J. Rorabaugh, USFWS, pers. comm.). Frogs probably took refuge in thick mats of cattails around the tank, but may have also stayed in cracks in the drying mud of the pond bottom, in rodent burrows, or other retreats that stayed moist. Frogs present in the mud or in emergent vegetation could be killed or injured during silt removal or berm repair. If not killed, they may be flushed from moist retreats and die of exposure or dessication, or be killed by predators. If remaining wetted soils and emergent vegetation are completely disturbed or removed during cleaning out of a tank, a frog population could possibly be eliminated.

As described, the proposed action would allow livestock to have access to riparian areas within the allotment. In addition to the mechanical damage (trampling) associated with livestock grazing in riparian areas, livestock trampling along drainages and in the upper watershed may generate sediments and/or nutrients that could enter potentially occupied leopard frog habitat. Sediments and/or nutrients may influence the invertebrate food base in some undefined manner by impacting the physical and vegetative characteristics of the aquatic habitat. In addition, sediments may be detrimental to successful reproduction by smothering egg masses and early larval stages. Eggs and tadpoles of Chiricahua leopard frogs may be trampled by domestic livestock along the perimeters of stock tanks and in pools along streams. Livestock can also contribute to degraded water quality at stock tanks including elevated hydrogen sulfide concentrations, which are toxic to frogs (Sredl *et al.* 1997).

No adverse effects are anticipated from the 200 acre tree thinning portion of this project.

In summary, the effects to the Chiricahua leopard frog from the proposed action may primarily occur in the riparian areas (in or associated with wetter areas), wetland communities, and stock tanks within the Buck Springs Allotment. Grazing effects also could result from the trampling of egg masses, tadpoles, and frogs from livestock having direct access to aquatic habitat or stock tanks. Diseases such as chytrid fungus can be moved among aquatic sites by livestock and operations.

CUMULATIVE EFFECTS

Cumulative effects include those of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions are subject to the consultation requirements established under section 7, and therefore are not considered cumulative in the proposed action. Future actions within the action area that are reasonably certain to occur include urban growth and development (private land within five miles to the north and the east of the allotment is proposed for development per Coconino County), recreation, road maintenance, fuels-reduction treatments, elk grazing, and other associated actions. These actions have the potential to reduce the quality of habitat for the spinedace, MSO, and Chiricahua leopard frog and contribute as cumulative effects to the proposed action.

Conclusion

The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

Little Colorado Spinedace and Critical Habitat

After reviewing the current status of the Little Colorado spinedace and its critical habitat, the environmental baseline for the action area, the effects of the proposed Buck Springs Range Allotment Management Plan, and the cumulative effects, it is our biological opinion that the Buck Springs Range Allotment Management Plan, as proposed, is not likely to jeopardize the continued existence of the Little Colorado spinedace, or result in the destruction or adverse modification of critical habitat. We make these findings for the following reasons (For a more detailed discussion see the Conservation Measures discussion in the Description of the Proposed Action section of this document.):

1. The Buck Springs Range Allotment Management Plan proposes the total exclusion of thousands of acres from livestock grazing in the southeastern portion of the allotment. Four-hundred acres of headwater meadows will be protected from livestock grazing. Improved meadow habitat conditions will aid in improving baseflows downstream, thus improving spinedace habitat conditions.

2. The rest-rotation system and reduced livestock numbers will lessen overall impacts to the uplands from livestock grazing, aiding in improved hydrologic conditions within the watershed.

3. Full implementation of the allotment management plan including the conservation measures is expected to greatly reduce the risk of direct impacts to critical habitat and spinedace through fencing and exclusion of livestock from critical habitat and occupied areas.

4. The proposed action has the potential to help restore depleted and extirpated spinedace populations within the Buck Springs Range Allotment through supplemental stocking. In order to stock native fish in Arizona, the Arizona Game and Fish Commission requires the permittee's concurrence. The permittee for the Buck Springs Range Allotment has agreed to aid in the recovery of the species by allowing spinedace to be stocked in three additional drainages in the allotment as a part of the proposed action.

Mexican Spotted Owl

After reviewing the current status of the MSO, the environmental baseline for the action area, the effects of the proposed Buck Springs Range Allotment Management Plan and the cumulative effects, it is our biological opinion that the Buck Springs Range Allotment Management Plan, as proposed, is not likely to jeopardize the continued existence of the MSO. Critical habitat for this species has been designated; however, this action does not affect any areas of critical habitat and no destruction or adverse modification of critical habitat is anticipated. We make this finding for the following reasons:

1. Although the Recovery Plan grazing recommendations will not be strictly followed due to the fact that some areas in the allotment are already below "good to excellent" range conditions, the reduced stocking levels and deferred rest-rotation strategy will allow range improvement over the time period considered in this consultation.

2. The incidental take anticipated in this opinion falls within the incidental take level anticipated in the non-jeopardy 1996 biological opinion for the MSO and the Forest Service Region 3 Forest Plan Amendments.

Chiricahua Leopard Frog

After reviewing the current status of the Chiricahua leopard frog, the environmental baseline for the action area, and the effects of the proposed Buck Springs Range Allotment Management Plan and the cumulative effects, it is our biological opinion that the Buck Springs Range Allotment Management Plan, as proposed, is not likely to jeopardize the continued existence of the Chiricahua leopard frog. No critical habitat has been designated for this species, therefore, none will be affected. The occurrence of Chiricahua leopard frogs in the project area is uncertain and we are unable to provide evidence indicating that the Chiricahua leopard frog exists on the Buck Springs Allotment at this time. However, if Chiricahua leopard frogs are documented within the allotment, we recommend that the Forest Service consider whether reinitiation of consultation is appropriate.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined in section 3 of the Act as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is defined at 50 CFR 17.3 to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined at 50 CFR 17.3 as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of the agency action, is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Forest Service so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest Service (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest Service must report the progress of the action and its impact on the species to us as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

Amount or Extent of Anticipated Take

Little Colorado Spinedace

Incidental take from the proposed livestock grazing on the Forest is expected to occur both as direct mortality of individual Little Colorado spinedace and as harm resulting from habitat modification and destruction. Though we have not documented livestock trampling fish on this allotment, we believe that take of spinedace is reasonably certain to occur from the grazing activities on the Buck Springs Range Allotment in the form of harm and/or harassment due to the potential for trampling of spinedace and/or fish eggs by livestock when livestock access occupied pools and the possible ingestion of fish and/or fish eggs by livestock at designated water crossings and water gaps or accessible riparian reaches. We expect that this take is reasonably certain to occur due to the small, isolated pool habitat that spinedace currently occupy on this allotment. Take is also anticipated to occur when exclosure or riparian fences are breached and livestock are able to access occupied and/or critical habitat, and when livestock loiter in accessible, occupied riparian reaches within the allotment (e.g. Yeager Canyon within the North and Moonshine Pastures and Dane III pool located in the southeast corner of the North McClintock Pasture).

Additionally, though we believe that the proposed action will significantly reduce the potential for the following conditions to occur, we believe that harm and/or harassment is reasonably certain to occur to the Yeager and Dane Canyon populations from: 1) reductions in surface flows due to watershed degradation; 2) altered watershed conditions that result in flashier streamflow; and 3) watershed conditions that result in unstable stream channels. The amount of take that occurs each year will depend upon the time any area is grazed, length of time any pasture is used, distribution of livestock across the pasture, effectiveness of utilization monitoring, and effects of previous years' grazing. Use of the watershed by livestock will effect runoff and seasonal water flows to the streams. Because of past actions and the damage to the riparian and aquatic habitats resulting from them, it is difficult to separate out new effects resulting from the continuation of livestock grazing on the watershed.

The anticipated level of take cannot be quantified in numbers of individual spinedace due to the variability in both size and location of spinedace populations within the drainage. In addition, dead fish are seldom found due to their small size and rapid consumption by scavengers. Therefore, the level of anticipated take will be quantified differently depending on whether incidental take is mortality or harm.

For livestock grazing on the Buck Springs Range Allotment, authorized incidental take will be considered to have been exceeded if any one of the following conditions occurs:

a) Livestock access pools and/or the riparian corridors within Yeager and Dane Canyons or other occupied habitat for more than three days or on more than one occasion. The concern is the potential for dewatering of pool habitat and/or trampling of spinedace within pools (especially when there is no room for displacement of fish to occur). Evidence of this occurring may include, but is not limited to, bank trampling and livestock-fouled water.

b) Stream crossings occur in occupied habitat other than those approved by the Fish and Wildlife Service and/or monitored by the Forest Service.

c) Identified key areas (agreed upon by the Fish and Wildlife Service, Forest Service, and Permittee) within the North, Moonshine, Horse, or North McClintock pastures or other pastures associated with occupied spinedace habitat exceed the utilization level set for that year.

Mexican Spotted Owl

We anticipate that the take of MSOs will be difficult to detect because finding a dead or impaired specimen is unlikely. However, the level of incidental take can be anticipated by the loss of essential elements in the habitat that would affect the reproductive success of the species. The primary type of take expected to result from grazing on the Buck Springs Range Allotment is through harassment by the reduction of suitability of the habitat for prey species, thus limiting the availability of prey for owls. This would impair the ability of MSOs to successfully raise young. We believe that grazing every other year and the 35% utilization level will be enough to improve prey habitat conditions within and adjacent to most PACs on the allotment. However, we anticipate that incidental take is reasonably certain to occur to one pair of MSOs and their young associated with the Aqueduct (040734) PAC. Livestock are able to access and potentially impact 100% of this PAC for five years (every other year of the ten year permit).

Chiricahua leopard frog

As stated above, the occurrence of Chiricahua leopard frogs in the project area is uncertain, and there is the potential that Chiricahua leopard frogs are present in unsurveyed suitable habitat in the allotment. However, surveys conducted in historical habitats within the allotment have not located frogs and unless the status of the species changes over time through immigration or the creation of habitats, we cannot be reasonably certain that the species occurs in the Buck Springs Range Allotment. Therefore, we anticipate no take of individual frogs as a result of the proposed action. If Chiricahua leopard frogs are documented in the action area, the Forest Service should determine whether reinitiation of consultation is appropriate.

The Fish and Wildlife Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions including amount and/or number specified herein.

Effect of the Take

In this biological opinion we determine that this level of anticipated take is not likely to result in jeopardy to the species considered herein.

Reasonable and Prudent Measures With Terms and Conditions

Little Colorado Spinedace

The following reasonable and prudent measures are necessary and appropriate to minimize take of Little Colorado spinedace:

In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described below and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The Forest Service shall minimize direct mortality to the Little Colorado spinedace in occupied habitat.

The following terms and conditions implement reasonable and prudent measure number one:

1.1 The Forest Service shall monitor livestock when they occupy the North Pasture to ensure that cattle are not entering Yeager Canyon; the North McClintock Pasture to ensure that cattle are not entering Dane Canyon; and any other pastures that may be found to contain occupied habitat.

1.2 Inspect and maintain all fences one month or less prior to livestock being put in a pasture and ensure that all fences are maintained while livestock are present. The Forest Service shall notify us of any livestock intrusion into excluded areas.

2. The Forest Service shall minimize indirect injury and mortality through the loss and alteration of Little Colorado spinedace occupied habitat.

The following terms and conditions implement reasonable and prudent measure number two:

2.1 Use of pastures containing spinedace habitat shall be limited to non-riparian areas when significant spinedace habitat is present within an occupied reach of the creek. If livestock access riparian areas they will be removed as soon as their presence is detected. If livestock are found to be congregating in riparian areas, the Forest Service will work with us to resolve the problem.

2.2 The Forest Service shall continue to implement a basinwide estimation technique to develop habitat and fish-population inventories within the East Clear Creek watershed. This will enable the Forest Service to identify spinedace habitat and minimize habitat loss and alteration.

3. The Forest Service shall monitor the fish community and habitat to document levels of incidental take.

The following term and condition implements reasonable and prudent measure number three:

3.1 If livestock gain access to extant Little Colorado spinedace sites (occupied sites) a professional fisheries biologist shall monitor for dead and injured spinedace. All findings of dead or injured fish shall be reported as specified in the Disposition of Dead or Injured Listed Species section, below.

3.2 All monitoring incorporated into the proposed action and that required as part of this incidental take statement shall be reported annually (calendar year or grazing year) to the Arizona Ecological Services Office at least 30 days prior to the issuance of the Annual Operating Plan. This report/meeting shall summarize for the previous calendar year: 1) implementation and effectiveness of the terms and conditions; 2) documentation of take, if any; 3) utilization monitoring summary and analysis; and 4) fish monitoring data. If other monitoring or research is completed concerning Little Colorado spinedace or rangeland conditions, riparian areas, or soil, a copy of the relevant reports shall be included. This report/meeting should be viewed as an opportunity for the Forest Service and Fish and Wildlife Service to annually communicate regarding the status of the species, environmental conditions, and implementation of the proposed action.

Review Requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Forest Service must immediately provide an explanation of the causes of the taking and review with the Arizona Ecological Services Office the need for possible modification of the reasonable and prudent measures.

Mexican Spotted Owl

We determine that the proposed action incorporates sufficient measures that reasonably and prudently minimize the effects of incidental take of MSOs. All reasonable measures to minimize take have been incorporated into the project description. Thus, no reasonable and prudent measures are therefore included in this incidental take statement.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to our Law Enforcement Office, 2450 West Broadway Road #113, Mesa, Arizona (telephone: (480) 967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state. If possible, the remains of intact owl(s) shall be provided to this office. If the remains of the owl(s) are not intact or are not collected, the information noted above shall be obtained and the carcass left in place. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should the treated owl(s) survive, please contact our Law Enforcement office regarding the final disposition of the animal.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

Little Colorado Spinedace

1. We recommend that the Forest Service continue implementing the *East Clear Creek Watershed Recovery Strategy for the Little Colorado Spinedace and Other Riparian Species* (USDA 1999). Specifically, we recommend closing the jeep trail that crosses Leonard Canyon north of Dines Tank and working with the Apache-Sitgreaves National Forest to close access from their side of Leonard Canyon. This will aid in eliminating vehicle access to the drainage. Further work to close the road should be added to the East Clear Creek Watershed Improvement Project that is scheduled for Fiscal Year 2003.

2. We recommend that the Forest Service consider establishing a research program to study the effects of elk on the livestock-excluded pastures within the Buck Springs Range Allotment.

3. We recommend that the Forest Service continue to identify factors that limit the recovery potential of the spinedace on lands under their jurisdiction and work to correct them.

Mexican Spotted Owl

1. We recommend the Forest Service reduce any possible effects of grazing on the prey base by improving upland range conditions in pastures in and adjacent to protected and restricted habitat.

2. We recommend that the Forest Service continue recovery of riparian areas, which constitute restricted habitat, and which may be occupied by MSOs.

3. We recommend that the Forest Service develop and initiate studies to gain a comprehensive understanding of how ungulate grazing affects the habitat of the MSO and its prey species.

4. We recommend that the Forest Service develop utilization standards for local geographic areas and habitat types, particularly in key habitat types such as riparian areas, meadows, and pine/oak and mixed conifer forests that incorporate allowable use levels based on current range conditions, key species, and the type of grazing system and standards which will accomplish moving rangeland conditions to good to excellent in the most expedient manner possible.

Chiricahua Leopard Frog

1. We recommend that the Forest Service work with us and the AGFD to reintroduce the Chiricahua leopard frog to suitable habitats identified through habitat assessment and surveys conducted throughout the allotment.

2. We recommend the Forest Service work with us and the AGFD to begin an aggressive program to control non-native aquatic organisms on the Forest, particularly bullfrogs, non-native fish, and crayfish.

3. We recommend that the Forest Service work with us to develop a programmatic biological opinion to cover future tank renovation and maintenance on the Coconino National Forest.

In order that we be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate your efforts to identify and minimize effects to threatened and endangered species in development of the Buck Springs Range Allotment Management Plan. In addition, we acknowledge both the Forest Service and the permittee's willingness to work with us to further the recovery process for the Little Colorado spinedace. We look forward to assisting you in implementing the proposed action and future actions which will continue to improve watershed condition. If you have any questions regarding this consultation, please contact Shaula Hedwall (928) 226-1811 or Brenda Smith (928) 226-0007 of our Flagstaff Suboffice. Please refer to consultation number 02-21-01-F-425 in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: Regional Director, U.S. Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
Field Supervisor, U.S. Fish and Wildlife Service, Albuquerque, NM
Project Leader, Fisheries Resource Office, Pinetop, AZ
Forest Biologist, Coconino National Forest, Flagstaff, AZ (Attn: Cecelia Overby)
Forest Fishery Biologist, Coconino National Forest, Flagstaff, AZ (Attn: Mark Whitney)

District Ranger, Mogollon Rim Ranger District, Happy Jack, AZ (Attn: Larry Sears)
Wildlife Staff, Mogollon Rim Ranger District, Happy Jack, AZ (Attn: Cathy Taylor)

Phil and Karin Knight, Applicants, Wickenburg, AZ
John Kennedy, Arizona Game and Fish Department, Phoenix, AZ

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LITERATURE CITED

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APPENDIX A - CONCURRENCE

This appendix contains our concurrence with your "may affect, not likely to adversely affect" determination for the Southwestern willow flycatcher.

Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The southwestern willow flycatcher was listed as an endangered species in 1995 (USDI 1995b). An obligate riparian nester, the flycatcher is found in dense vegetation adjacent to streams, ponds, lakes, and springs. Vegetative species commonly present include boxelder, willow, ash, walnut, cottonwood, seep willow, button bush, cattails, Russian olive, and tamarisk. This species apparently prefers dense vegetation up to 20 feet high with standing water below or next to the vegetation. In higher elevation streams, vegetation may be limited to as few as two or three species of willow in dense thickets between 15 and 20 feet tall. Patch structure is generally characterized by a single vegetative layer.

Potential habitat for this species occurs along East Clear Creek downstream of Blue Ridge Reservoir, where willows are the dominant riparian vegetation. Four miles of this habitat exists along the northern boundary of the Buck Springs Allotment. Formal surveys of this habitat were conducted in 1993 and 1994, and no flycatchers were detected.

The 1993 floods reduced the willow communities along East Clear Creek and degraded potential habitat for southwestern willow flycatchers. It is unclear whether the habitat has the potential to become suitable in the future. The Forest Service continues to assess the habitat and the potential for flycatchers and evaluate activities that have the potential to affect habitat or disturb birds. Habitat evaluations were last conducted in 2002, with no change in condition of the habitat. Habitat along East Clear Creek above the reservoir and within the allotment does not support the willow community necessary for potential or suitable habitat.

The nearest known suitable habitat occurs greater than ten miles from the allotment and occupied habitat is greater than 20 miles away. The potential habitat on the boundary of the allotment is topographically excluded from livestock grazing. Therefore, the Forest Service states that there are not direct effects to flycatchers or their potential habitat and no indirect effects to flycatchers through disturbance or cowbird parasitism.

Indirect impacts to potential habitat due to grazing effects on watershed condition in headwater meadows and riparian drainages are possible. Poor watershed conditions in the uplands may have adverse indirect effects on flycatcher habitat. Livestock grazing and other activities contribute to the removal of organic material on the soil surface, removal of vegetative cover, compaction, and decreases in infiltration of the soil. These conditions may increase surface runoff that scours habitat and reduces the potential suitability for flycatchers.

The BAE states that potential southwestern willow flycatcher habitat will continue to be surveyed. If the potential habitat becomes suitable, surveys will be conducted for willow flycatcher occupancy annually. If these sites are determined to have breeding flycatchers within five miles of the allotment, the Forest Service will initiate a cowbird trapping program or immediately remove livestock from pastures located within a five mile radius of the birds during the critical season (April 1 through July 31).

We concur with the Forest Service's determination that the proposed action may affect, but will not likely adversely affect, the southwestern willow flycatcher. We base this determination on the following:

1) Livestock use occurs greater than five miles from occupied habitat during the breeding season.

2) Livestock grazing does not occur in unoccupied suitable habitat or potential habitat for the southwestern willow flycatcher.