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AESO/SE  
02-21-98-F-0399-R2

January 2, 2004

Mr. John McGee, Forest Supervisor  
Coronado National Forest  
300 West Congress Street, 6<sup>th</sup> Floor  
Tucson, Arizona 85701

Dear Mr. McGee:

This reinitiated, final biological and conference opinion (BO) responds to your request for consultation with us pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your revised and clarified request for reinitiation of formal consultation was dated May 8, 2003, and received by us on May 12, 2003. At issue are effects that may result from livestock grazing on the Kunde and Papago allotments, in Santa Cruz County, Arizona. Our original biological and conference opinion was dated October 25, 2002 (02-21-98-F-399-R1) (2002 BO). You requested reinitiation of consultation because:

- we proposed to list the Gila chub (*Gila intermedia*) as endangered with critical habitat (67 FR 51948),
- adverse effects to the threatened Chiricahua leopard frog (*Rana chiricahuensis*) are likely to occur (our staffs discussed this topic during a September 25, 2003 telephone conversation and we jointly agreed to formally consult on the frog. Effects are anticipated to be similar for the frog as for the proposed endangered Gila chub),
- Gila topminnow (*Poeciliopsis occidentalis*) were documented in O'Donnell Creek by Arizona Game and Fish Department (AGFD) personnel and others on November 10, 2003,
- the Kunde allotment was covered for only one year in the original opinion,
- a more refined analysis of capable acreage modified the 2002 BA figure of 13,380 capable acres to 12,205 capable acres for the combined Papago/Z-Triangle allotment, and
- Kunde and Papago allotments will be permitted for reduced livestock numbers compared to the original consultation.

In the 2002 consultation, you concluded that the proposed action on the Kunde and Papago allotments would not affect the Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*), the Mexican spotted owl (*Strix occidentalis lucida*), the Huachuca water umbel (*Lilaeopsis schaffneriana* spp. *recurva*), and the Canelo Hills ladies' tresses (*Spiranthes delitescens*). You revised your determinations for these species and now conclude that the proposed action may affect, but is not likely to adversely affect, these species. We concur with your determinations for these species and our rationale for these concurrences are contained in Appendix A of this BO.

Regarding the jaguar (*Panthera onca*), your September 10, 2003 clarification letter noted that your earlier determination that the proposed action may affect, but is not likely to adversely affect the jaguar was in error. In your 2002 biological assessment (BA) (U.S. Forest Service 2002), you determined that the proposed action for the Kunde and Papago allotments would not affect jaguar. Your clarifying letter affirmed your determination due to the following:

1. State-accepted sightings have not been documented for the mountain range or drainage corridors in the allotments since 1970.
2. Livestock grazing will occur in some riparian areas, but grazing as proposed will not appreciably reduce jaguar cover compared to the environmental baseline.
3. Livestock management activities will not permanently disrupt connectivity corridors within the U.S. and Mexico.

We agree with your determination for the jaguar.

Your cover letter also requested conferencing regarding effects of the proposed action to the proposed endangered Gila chub and proposed Gila chub critical habitat on the Papago allotment. In your biological assessment and evaluation (BAE), you determined that effects from the proposed action are not likely to jeopardize the species, but are likely to adversely modify proposed critical habitat on the Papago allotment.

We received written clarification of your determinations for the proposed endangered Gila chub and proposed Gila chub critical habitat on September 10, 2003. You clarified that if the Gila chub is listed, effects from the proposed action are likely to adversely affect the species and likely to adversely affect proposed critical habitat, for the following reasons:

1. On the Papago allotment, about 0.25 mile of O'Donnell Creek is proposed Gila chub critical habitat. It is currently occupied by Gila chub which spend the dry months of the year in deep upstream pools and travel the creek during months of active flow.
2. Cienega Creek (west of O'Donnell Creek) is ephemeral (except at Papago Spring); its headwaters begin and cross about 2.5 miles of the Papago allotment before flowing downstream

across lands administered by the Bureau of Land Management (BLM), State, and private owners, to the Santa Cruz River. About nine miles of Cienega Creek on BLM land is proposed Gila chub critical habitat because it is perennial; it lies about 11 miles downstream of the headwaters.

3. Direct effects to proposed Gila chub and proposed critical habitat on O'Donnell Creek will be greatly reduced by the fenced exclusion of livestock from the creek. The exception to livestock exclusion from the creek will occur bi-annually, when about 75 cattle are proposed to be herded across the creek between two pastures due to pasture rotation schedules.

4. Watershed condition is less than 50 percent satisfactory; soil condition is impaired; and range condition is poor on the subwatersheds upstream from proposed Gila chub occupied habitat. These conditions are anticipated to slowly improve as a result of the proposed action but, in the interim, will continue to cause downstream effects (such as increases in sedimentation) that are neither discountable nor insignificant. As a result, effects to the proposed Gila chub and its proposed critical habitat are considered here in formal conferencing.

Regarding Gila topminnow, you sent us a supplemental biological assessment (BA) dated December 10, 2003, that incorporates information regarding the newly documented (November 2003) population of Gila topminnow in O'Donnell Creek and analyzes effects of the proposed action on the species. This information was received after the draft biological and conference opinion was sent to you (November 13, 2003) and is included in this final document.

This final biological and conference opinion is based on information provided in your April 14, 2003 BAE, your March 2003 environmental assessment (EA), letters and comments addressing the EA from citizens, the described project proposal, telephone and electronic conversations and communications between our staffs, field investigations, and other sources of information. References cited in this biological and conference opinion is not a complete bibliography of all references available on the various species of concern, livestock grazing and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file in our Phoenix office.

### **Consultation History**

- August 13, 1997: We received your August 13, 1997, BAE for the range project to create a 28-acre livestock exclosure area on O'Donnell Creek on the Papago allotment.
- August 18, 1997: We issued our concurrence letter for your exclosure project, per your August 13, 1997 BAE.
- July 29, 1999: We issued our BO for short-term and long-term livestock grazing activities on the Coronado National Forest (CNF), consultation number 02-21-98-F-0399.
- October 24, 2002: We finalized our BO for continued ongoing and long-term livestock

grazing on the CNF, consultation number 02-21-98-F-0399-R1.

- April 14, 2003: We received your revised BAE for the above named allotments.
- May to June, 2003: We received your EA for proposed changes in the Allotment Management Plans (AMPs) for the Kunde and Papago allotments, including three comment letters from the public.
- May 12, 2003: We received your updated BAE and cover letter for the above-named allotments.
- September 10, 2003: We received your written clarification of your analysis and determination of effects for Gila chub and jaguar.
- September 25, 2003: Our staffs discussed the effect determination for Chiricahua leopard frog and agreed to formally consult on the species.
- November 13, 2003: We sent you the draft biological and conference opinion for your review of accuracy and additional comments.
- December 15, 2003: We received and incorporated your comments and supplemental information regarding a newly documented population of Gila topminnow on private lands along O'Donnell Creek into our final biological and conference opinion.

Conversations between our staffs on reinitiation of consultation and minimization measures were discussed as you were writing and updating the BAE and after we received it. The Kunde and Papago allotments are covered in this reinitiated consultation, and discussion of the Seibold, Crittenden, and San Rafael allotments are included in our environmental baseline and effects of the action because they are part of the action area.

## **BIOLOGICAL OPINION**

### **DESCRIPTION OF THE PROPOSED ACTION**

The Kunde and Papago allotments are located in the Canelo Hills of the Sierra Vista Ranger District, CNF, in Santa Cruz County of southeastern Arizona. The Canelo Hills lie between the Patagonia and Huachuca mountains. The town of Patagonia is due west of the allotments; the town of Sonoita is due north. Redrock Canyon passes through the Kunde allotment, which is situated southwest of the Papago allotment. Lampshire Canyon (a Redrock Canyon tributary), along with several minor tributaries, crosses the Kunde and Papago allotments. The Papago allotment also contains a short (2.5 mile) reach of Cienega Creek and is in the Middle San Pedro 5<sup>th</sup> code watershed. The allotments are (entirely or partially) in the Redrock 6<sup>th</sup> code watershed and the Sonoita Creek 5<sup>th</sup> code watershed. The elevational range is from about 4,200 to 6,000

feet, with the vegetation type primarily composed of broadleaf woodland and semi-desert grassland (Brown 1994).

### **Project Description**

You propose issuance of 10-year term grazing permits (2003 to 2013) for the Kunde and Papago allotments as well as development and implementation of Allotment Management Plans (AMPs) for these allotments. Best management practices for livestock grazing operations as described in Forest Service Handbook 2209 will apply to all allotments. They include, but are not limited to, annual preparation of annual operating instructions (AOIs) with the permittee(s) to allow for changing allotment conditions; periodic field checks to identify needed adjustments in season of use and livestock numbers (including stock counts, forage use, and assessment of rangeland to verify soil and range condition and trends); and use of necessary techniques to achieve proper distribution or lessen impacts on areas that are sensitive to livestock disturbance or would naturally be overused by livestock.

**Kunde:** The proposed action remains the same as analyzed in our 2002 BO, with the following exceptions:

- A 10-year term grazing permit for 31 cattle year long (CYL) will be issued. This is a reduction from the prior amount of 53 CYL as consulted on in the 2002 BO. This reflects the reduction in acres as consulted on in the 2002 BO (4,199 acres) to 3,477 capable acres, due to the removal of use of the Redrock pasture. This precludes the need to construct the division fence proposed under Alternative 3 of the proposed action in the EA.
- The Redrock pasture will be closed to livestock grazing. This is anticipated to reduce impacts to the Gila topminnow and help improve riparian and watershed conditions in Redrock Canyon.
- A pipeline will be built from the Crittenden allotment (adjacent to Kunde) storage tanks to the Upper and Lower Lampshire pastures of the Kunde allotment. This will allow water projects to be established on the Kunde allotment and is anticipated to aid in livestock distribution and improved rangeland and watershed condition over time (this project is also referenced under the Crittenden allotment proposed action in the EA).

**Papago:** The proposed action remains the same as that analyzed in our 2002 BO, with the following exceptions:

- The permit issued will be for 250 CYL in an 18-pasture rotation. This is a change from the 400 cow/calf and five horses, from March 1 to February 28, annually, in a 14-pasture rotation that was consulted on in the 2002 BO.

- The 2002 BO did not list range projects; the following proposed projects are new. Fence and water developments listed below are expected to provide increased control of livestock and effectiveness of pasture rotation which is anticipated to maintain or improve overall range condition. Range projects in pastures of the allotments will be functional before livestock enter those pastures. If projects are not needed and the management plan can be successfully implemented, livestock grazing can occur in those pastures. Lengths are approximate.
  - The Middle/North division fence (0.75 mile) will be reconstructed.
  - A fence to divide Maloney and Falda pastures (0.25 mile) will be constructed.
  - The Hampshire/Pinto division fence (1.0 mile) will be reconstructed.
  - The trap in North pasture will be removed and not replaced.
  - A pipeline into Papago pasture from the well in the northwestern end of Middle pasture (2.5 to 3.0 miles) will be constructed.
  - A pipeline into Rincon pasture from Cave Well (0.75 mile) will be constructed.
  - Sediment/debris will be cleaned from Double Tanks.
  - The pipeline in West Mountain pasture (1.0 mile) will be reconstructed.
  - The pipeline in Hampshire pasture (1.5 miles) will be extended.
  - A pipeline into Pinto pasture (1.5 miles) will be constructed.
  - A pipeline from a storage tank in 83 pasture to troughs at the northern and southern portions of 83/E Cemetery division fence will be constructed.
  - A pipeline into Roundup pasture and a trough on the eastern side will be constructed.

You propose to move livestock between East and Roundup pastures twice a year, each year. These two pastures are bisected by O'Donnell Creek (and its accompanying livestock grazing enclosure) and this requires that the livestock be herded across the creek. This action was originally identified as part of the proposed action in 1997 when we first consulted on the Papago allotment. No further mention of this action has occurred in subsequent BAs or BOs; however, it remains part of the proposed allotment management and is included in this consultation.

### **Conservation Measures**

1. Terms and conditions, per the 2002 BO, for the Chiricahua leopard frog, Gila topminnow, Gila chub, and lesser long-nosed bat are being implemented and are part of the proposed action for the Papago and Kunde allotments.

For the Chiricahua leopard frog, Gila topminnow, and Gila chub, in addition to 1., above:

2. Minimization measures for effects from the bi-annual livestock crossing of O'Donnell Creek on the Papago allotment include, but are not limited to:

- Only a pre-selected creek crossing location will be used.

- Time constraints for total crossing activity will be in place.
  - Livestock group sizes will be constrained for crossing.
  - Best efforts will be made for livestock crossing during dry rather than wet conditions.
3. The Redrock pasture on the Kunde allotment will be closed to grazing.

For the Gila topminnow, in addition to 1., 2., and 3., above:

4. The division fence (about 0.25 mile) between the Holding and Lower Lampshire pastures on the Kunde allotment will be completed and functional (per the Redrock Canyon Action Plan) before any livestock enter these pastures.

## **SPECIES-SPECIFIC DISCUSSIONS**

**NOTE: Greater details and information regarding the biology, life history, and habitat needs for the species considered in this biological and conference opinion may be located on our website ([www.arizonaes.gov](http://www.arizonaes.gov)) under the Threatened and Endangered Species, Document Library/Documents by Species links.**

### **Chiricahua leopard frog (*Rana chiricahuensis*)**

The Chiricahua leopard frog was not considered in formal consultation on either the Kunde and Papago allotments in our 2002 BO; thus, we provide a full analysis for these two allotments (rather than only evaluating changes from the 2002 BO) for this species.

### **STATUS OF THE SPECIES**

We listed the Chiricahua leopard frog as threatened, without critical habitat, in a Federal Register notice (65 FR 37343) dated June 13, 2002 (U.S. Fish and Wildlife Service 2002b). We included a special rule to exempt operation and maintenance of stock tanks on non-Federal lands from the section 9 take prohibitions of the Act.

The Chiricahua leopard frog is an inhabitant of cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 feet 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 and northern Durango (Platz and Mecham 1984, Degenhardt *et al.* 1996, Sredl *et al.* 1997, Sredl and Jennings *in press*).

Based on Painter (2000) and the latest information for Arizona, the species is still extant in most major drainages in Arizona and New Mexico where it occurred historically, with the exception of

the Little Colorado River drainage in Arizona and possibly the Yaqui drainage in New Mexico. It has also not been found recently in many rivers, valleys, and mountains ranges, including the following in Arizona: White River, West Clear Creek, Tonto Creek, Verde River mainstem, San Francisco River, San Carlos River, upper San Pedro River mainstem, Santa Cruz River mainstem, Aravaipa Creek, Babocomari River mainstem, and Sonoita Creek mainstem. In southeastern Arizona, no recent records (1995 to the present) exist for the following mountain ranges or valleys: Pinaleno Mountains, Peloncillo Mountains, Sulphur Springs Valley, and Huachuca Mountains. The species is (2003) absent from all but one of the southeastern Arizona valley bottom cienega complexes. In many of these regions Chiricahua leopard frogs were not 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 (U.S. Fish and Wildlife Service 2002b).

Threats to this species include predation by nonnative organisms, especially bullfrogs, fish, and crayfish; disease; drought; floods; degradation and loss of habitat as a result of water diversions and groundwater pumping, poor livestock management, altered fire regimes due to fire suppression and livestock grazing, mining, development, and other human activities; disruption of metapopulation dynamics; increased chance of extirpation or extinction resulting from small numbers of populations and individuals; and environmental contamination. Loss of Chiricahua leopard frog populations is part of a pattern of global amphibian decline, suggesting other regional or global causes of decline may be important as well (Carey *et al.* 2001). Numerous studies indicate that declines and extirpations of Chiricahua leopard frogs are at least in part caused by predation and possibly competition by nonnative organisms, including fish in the family Centrarchidae (*Micropterus* spp., *Lepomis* spp.), bullfrogs (*Rana catesbeiana*), tiger salamanders (*Ambystoma tigrinum mavortium*), crayfish (*Orconectes virilis* and possibly others), and several other species of fish (Fernandez and Rosen 1998; Rosen *et al.* 1994; 1996; Snyder *et al.* 1996; Fernandez and Bagnara 1995; Sredl and Howland 1994; Clarkson and Rorabaugh 1989). 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 nonnative 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 winked out 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 and in cienega complexes have disappeared.

Fire frequency and intensity in Southwestern forests are much altered from historical conditions (Dahms and Geils 1997). Before 1900, surface fires generally occurred at least once per decade in montane forests with a pine component. Beginning about 1870-1900, these frequent ground fires ceased to occur due to intensive livestock grazing that removed fine fuels, followed by effective fire suppression in the mid to late 20<sup>th</sup> century (Swetnam and Baisan 1996). Absence of ground fires allowed a buildup of woody fuels that precipitated infrequent but intense crown fires (Danzer *et al.* 1997, Swetnam and Baisan 1996). Absence of vegetation and forest litter following intense crown fires exposes soils to surface and rill erosion during storms, often causing high peak flows, sedimentation, and erosion in downstream drainages (DeBano and Neary 1996). Following the 1994 Rattlesnake fire in the Chiricahua Mountains, Arizona, a debris flow filled in Rucker Lake, a historical Chiricahua leopard frog locality. Leopard frogs (either Chiricahua or Ramsey Canyon leopard frogs) apparently disappeared from Miller Canyon in the Huachuca Mountains, Arizona, after a 1977 crown fire in the upper canyon and subsequent erosion and scouring of the canyon during storm events (Tom Beatty, Miller Canyon, pers. comm. 2000). Leopard frogs were historically known from many localities in the Huachuca Mountains; however, natural pool and pond habitat is largely absent now and the only breeding leopard frog populations occur in man-made tanks and ponds. Crown fires followed by scouring floods are a likely cause of this absence of natural leopard frog habitats. Bowers and McLaughlin (1994) list six riparian plant species they believed might have been eliminated from the Huachuca Mountains as a result of floods and debris flow following destructive fires.

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. Dispersal of leopard frogs away from water in the arid Southwest may occur less commonly than in mesic environments; however, there is evidence of substantial movements in Arizona. Movement may occur via movement of frogs or passive movement of tadpoles along streamcourses. In 1974, Frost and Bagnara (1977) noted passive or active movement of Chiricahua and Plains (*Rana blairi*) leopard frogs for five miles or more along East Turkey Creek in the Chiricahua Mountains. In August of 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 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 nonnative 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 mile 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).

Recent evidence suggests a chytridiomycete skin fungi is responsible for observed declines of frogs, toads, and salamanders in portions of Central America (Panama and Costa Rica), South America (Atlantic coast of Brazil, Ecuador, and Uruguay), Australia (eastern and western States), New Zealand (South Island), Europe (Spain and Germany), Africa (South Africa, “western Africa”, and Kenya), Mexico (Sonora), and United States (8 States) (Hale 2001, Speare and Berger 2000, Longcore 2000, Berger *et al.* 1998).

The role of the fungi in the population dynamics of the Chiricahua leopard frog is as yet undefined. It is clear that Chiricahua leopard frog populations can exist with the disease for extended periods. The frog has coexisted with chytridiomycosis in Sycamore Canyon, Arizona since at least 1974; however, at a minimum, it is an additional stressor, resulting in periodic die-offs that increase the likelihood of extirpation and extinction. It may well prove to be an important contributing factor in observed population decline, and because of the interchange of individuals among subpopulations, metapopulations of frogs may be particularly susceptible. Rapid death of all or most frogs in stock tank populations in a metapopulation of Chiricahua leopard frogs in Grant County, New Mexico was attributed to post-metamorphic death syndrome (Declining Amphibian Populations Task Force 1993).

Tiger salamanders and bullfrogs can carry the disease without exhibiting clinically significant or lethal infections. When these animals move or are moved by people among aquatic sites, chytridiomycosis may be carried with them (Collins *et al.* 2003). Chytrids could also be spread by recreationists, hikers and hunters with dogs, and people 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. We and the Arizona Game and Fish Department (AGFD) are employing preventative measures to ensure the disease is not spread by aquatic sampling.

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

## **ENVIRONMENTAL BASELINE**

On the Papago allotment, Chiricahua leopard frogs were found in the vicinity of the O’Donnell Creek enclosure in 2000 and were found that same year at Freeman Spring. They were not found

at Freeman Spring in 2003. They are not known to occur elsewhere on the allotments, but suitable habitat exists in Redrock Canyon and other sites throughout the watershed. Chiricahua leopard frogs can disperse and colonize suitable habitats nearby or up to five miles away (Frost and Bagnara 1977, see discussion above). They could occur, unknown or undetected, in any water in the allotments. You have proposed that terms and conditions from the 2002 BO, including implementing Forest guidelines for stock pond maintenance and management, will apply to the Kunde and Papago allotments.

## **EFFECTS OF THE ACTION**

Livestock grazing effects on ranid frog populations are not well studied. Munger *et al.* (1994) found that sites that supported adult Columbia spotted frogs (*Rana luteiventris*) had significantly less grazing pressure than sites that did not support spotted frogs. In a subsequent survey, Munger found no differences between the two types of use in these types of areas (Munger *et al.* 1996). Bull and Hayes (2000) evaluated reproduction and recruitment of the Columbia spotted frog in 70 ponds used by cattle and 57 ponds not used by cattle. Significant differences were not found in the number of egg masses or recently metamorphosed frogs in grazed and ungrazed sites in this study. Seventeen percent of the sites were livestock tanks. The California red-legged frog (*Rana aurora draytonii*) coexists with managed livestock grazing in many places in California. Ponds created as livestock waters have created habitats for red-legged frogs, and livestock may help maintain habitat suitability by reducing coverage by cattails, bulrush, and other emergent vegetation (U.S. Fish and Wildlife Service 2002e). In another study, exclusion of cattle from the Simas Valley (Contra Costa County, California), corresponded with re-establishment of native trees and wetland herbs, reestablishment of creek pools, and expansion of red-legged frog populations (Dunne 1995).

Maintenance of viable populations of Chiricahua leopard frog is thought to be compatible with well-managed livestock grazing. Grazing occurs in most of the habitats occupied by this frog. One large and healthy population of Chiricahua leopard frog coexists with cattle and horses on the Tularosa River in New Mexico (Jennings 1995). Throughout their range, Chiricahua leopard frog are often found living in earthen livestock tanks. These tanks are heavily used by livestock, especially cattle, yet Chiricahua leopard frogs persist at these sites often for decades. Nevertheless, livestock grazing activities can degrade habitats and result in mortality of individual frogs or loss of populations.

Livestock grazing effects on Chiricahua leopard frog habitat include both creation of habitat and loss and degradation of habitat (Sredl and Jennings, in press). Construction of stock tanks for livestock water has created 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 percent of extirpated localities (Sredl and Saylor 1998), suggesting Arizona populations of this species have fared better in stock tanks than in "natural" habitats. Stock tanks provide small patches of habitat that 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 nonnative predators (with the exception of bullfrogs) than natural sites.

Adverse effects to the Chiricahua leopard frog and its habitat as a result of livestock grazing and management actions may occur under certain circumstances. These effects include: facilitating dispersal of nonnative predators; trampling of egg masses, tadpoles, and frogs; possible incidental ingestion (of small larvae or eggs while drinking); deterioration of watersheds; degraded water quality and subsequent toxic effects on frogs; erosion and/or siltation of stream courses; elimination of undercut banks that provide cover for frogs; loss of cover provided by wetland and riparian vegetation; loss of backwater pools; and spread of disease (U.S. Fish and Wildlife Service 2002b, Belsky *et al.* 1999, Bartelt 1998, Jancovich *et al.* 1997, Ohmart 1995, Hendrickson and Minckley 1984, Arizona State University 1979). Creation or maintenance of livestock waters in arid environments may provide the means for nonnative predators such as bullfrogs and crayfish to move across landscapes that would otherwise serve as barriers to their movement. Vehicle use associated with or facilitated by the grazing program at or near habitats of the frog could result in animals being run over. For instance, a live Chiricahua leopard frog was found in September 2002 on Ruby Road in the Pajarito Mountains, (Nogales Ranger District of the CNF), in Santa Cruz County, Arizona. Frogs were also found at the same time in a pool within 10 feet of the road. (J. Rorabaugh, USFWS, pers. comm.). Ruby Road is the primary access route for ranchers and others in this mountain range. Frogs on the road could be killed by vehicles, and in some populations of leopard frogs, road mortality can significantly reduce populations (Carr and Fahrig 2001). Maintenance of livestock tanks can result in death or injury of frogs because tanks are periodically dredged out to remove silt. Dredging is usually conducted when the tank is dry or nearly dry; however, as tanks dry out, frogs take refuge in cracks in the mud around tanks or clumps of emergent vegetation. As the tank was drying up, several Chiricahua leopard frogs were excavated out of cracks around Walt's Tank on the Coconino National Forest in September 2002. If backhoes or other equipment had been brought in to dredge out the tank at that time, these frogs would have certainly perished. You have adopted stock tank maintenance and management guidelines that should minimize effects to frogs in these situations.

Increased erosion in the watershed caused by livestock grazing can accelerate sedimentation of deep pools used by frogs (Gunderson 1968). Sediment alters primary productivity and fills interstitial spaces in streambed materials with fine particulates that impede water flow, reduce oxygen levels, and restrict waste removal (Chapman 1988). Chiricahua leopard frogs, particularly eggs, tadpoles, and metamorphs, are probably trampled by cattle on the perimeter of stock tanks and in pools along streams (Bartelt 1998, Ross *et al.* 1999, U.S. Fish and Wildlife Service 2002e). Working in Nye County, Nevada, Ross *et al.* (1999) found a dead adult Columbia spotted frog (*Rana luteiventris*) in the hoof print of a cow along a heavily grazed stream. They observed numerous other dead frogs in awkward postures suggesting traumatic death, likely due to trampling. In Idaho, Bartelt (1998) documented near complete loss of a metamorph cohort of boreal toads (*Bufo boreas*) due to trampling by sheep at a livestock tank. Juvenile and adult frogs can probably often 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. Cattle can remove bankline vegetation 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 the basking and foraging habitat created by cattle when they open up banklines through grazing and hoof action.

Chiricahua leopard frogs can be adversely affected by degraded water quality caused by cattle urine and feces. At Headquarters Windmill Tank on the CNF in the Chiricahua Mountains of southeastern Arizona, Sredl *et al.* (1997) documented heavy cattle use at a stock tank that resulted in degraded water quality, including elevated hydrogen sulfide concentrations. A die-off of Chiricahua leopard frogs at the site was attributed to cattle-associated water quality problems, and the species has been extirpated from the site since the die-off occurred (U.S. Fish and Wildlife Service 2002b, Phoenix Office files). Larval frogs may be particularly susceptible to nitrogenous compounds that can be associated with grazing (Schepers and Francis 1982, Boyer and Grue 1995). Toxicity could result from high concentrations of un-ionized ammonia (Schuytema and Nebeker 1999), particularly in combination with primary-production induced elevation in pH.

Grazing activities could result in spread of infectious disease. 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. Personnel working at an infected tank or aquatic site and then traveling to another site, thereby transferring mud or water from the first site, could also spread this disease. Chytrids could be carried inadvertently in mud clinging to wheel wells or tires, or on shovels, nets, boots, or other equipment. Chytrids cannot survive complete drying; if equipment is allowed to thoroughly dry, the likelihood of disease transmission is greatly reduced. Bleach or other disinfectants can also be applied to tools and vehicles and will kill chytrids (Loncore 2000). Grazing activities could also increase the susceptibility of frogs to disease. Degraded water quality, threat of trampling, or other stressors caused by grazing activities could alter immune response of frogs, making them more susceptible to disease (Carey *et al.* 1999).

Transfer of chytrids and nonnative predators could occur during introductions of fish or other aquatic organisms. Permittees haul water to tanks and troughs. If the water source contains fish, bullfrogs, or crayfish, these animals may be transported inadvertently with the water to a site occupied by the Chiricahua leopard frog. Bullfrogs (Bradley *et al.* 2002), tiger salamanders (Collins *et al.* 2003), and likely other organisms, can carry chytrids from one site to another (in addition to chytrids carried via water or mud from infected sites). The nonnative predators would likely prey upon and may eliminate Chiricahua leopard frogs from the site to which the water was hauled. Also, maintenance of roads and tanks needed for livestock grazing could provide fishing opportunities and facilitate tank access by anglers, hunters, or other recreationists. These people (and possibly their dogs) may inadvertently introduce chytrids from other locales, or may intentionally introduce nonnative predators for angling or other purposes.

O'Donnell Creek is the only place on the allotments which currently is known to support a population of Chiricahua leopard frogs. Livestock will be actively herded bi-annually across

O'Donnell Creek and the enclosure during differing times of each year. Refer to the Conference Opinion for the Gila chub section of this BO for details of this action. Minimization measures taken for Gila chub during this action will benefit Chiricahua leopard frogs. Chiricahua leopard frogs existing in O'Donnell Creek are most likely to be present at the livestock crossing site during wet times (active stream flow). Adult frogs will likely move to the deep pools upstream from the crossing site each year as stream flow diminishes and dries up at the crossing site. During the warmer months, any adult frogs in the vicinity of the crossing are likely to move out of harms way; although a few could be killed or injured (Bartelt 1998, Ross *et al.* 1999), particularly during the winter when they are inactive. Egg masses, small tadpoles, and very small juvenile frogs may be present in the creek every year, and are vulnerable to trampling or accidental ingestion if they are at the crossing site when stream flow is continuous and livestock are being pushed at that particular time of year.

Recent records at Freeman Spring and elsewhere in the region suggest Chiricahua leopard frogs could colonize suitable habitats over the next 10 years, or may be present but undetected, at waters on either the Kunde or Papago allotments. These animals could be adversely affected in the ways discussed above. Some of the best potential habitats occur in Redrock Canyon on the Kunde allotment. The Redrock pasture will be closed to livestock grazing. This action will exclude Redrock Creek (between The Falls and Gate Spring enclosures) from direct grazing impacts and provide a measure of watershed protection in the uplands within the Redrock pasture; this will aid in maintaining and promoting suitable Chiricahua leopard frog habitat in this stretch. Other commitments that you have made in your proposed action act to reduce effects to Chiricahua leopard frogs in the following ways:

1. You have committed to regular inspections of the Redrock and other riparian enclosures and prompt removal of trespass cattle.
2. Before conducting maintenance at a livestock tank, the tank will be surveyed for frogs, and any frogs found will be salvaged, held, and then restocked at the tank when it refills.
3. Measures will be taken to minimize introduction of nonnative predators, either intentionally or unintentionally by the CNF or permittees.
4. At all sites where Chiricahua leopard frogs occur, all personnel authorized to work, inspect or survey at any aquatic site within the allotment (on Forest lands), will be required to clean and treat any and all equipment (shovels, nets, buckets, fence posts, boots, etc.), used at an aquatic site with a 10 percent bleach solution, or allow all equipment to dry thoroughly, before using the same equipment at another aquatic site. This measure will reduce the likelihood of disease transmission.
5. If other aquatic sites are found to be occupied by Chiricahua leopard frogs, you shall use your authorities, seek funding, and develop agreements with permittees to fence portions of as many of these sites as is feasible and reasonable to limit access by cattle, and potential impacts such as trampling of frogs and bankline cover.

## CUMULATIVE EFFECTS

Cumulative effects include the effects 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 that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Because of the extent of Forest Service lands in the action area, most actions occurring in the area will be Federal actions, the effects of which are not considered as cumulative effects. One future private action in the action area may be the sale of the Kunde private inholding. Another is the certain continued and increased groundwater pumping that does and will occur as the communities surrounding the action area continue to develop and grow. Increased groundwater pumping will contribute to declining flows in the creeks in area. A related concern is the growth of “ranchette” developments near the headwaters of Cienega Creek, which intensifies negative downstream adverse effects from the unstable conditions on the Papago allotment. Erosion problems, such as the headcut on Cienega Creek, may partially result from upper watershed problems such as occur on the Papago allotment.

## CONCLUSION

After reviewing the current status of the Chiricahua leopard frog, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action, as described for these allotments, is not likely to jeopardize the continued existence of the Chiricahua leopard frog. Critical habitat has not been designated for this species; therefore, none will be affected.

We base our conclusion on the reasons given in our 2002 BO and because:

1. The Chiricahua leopard frog coexists with well-managed livestock grazing and can benefit from creation and maintenance of livestock waters.
2. The AMPs provide for enhanced flexibility in livestock management, which should aid in reducing watershed effects of livestock grazing.
3. The Redrock pasture is closed to grazing and will aid in maintaining and creating Chiricahua leopard frog habitat.
4. We believe that amelioration of livestock impacts at springs and creeks (because of the inspection and maintenance of the exclosures) will result in the formation of habitat that can support Chiricahua leopard frog populations.
5. Your proposed action includes implementing terms and conditions from the 2002 BO in regard to the Papago and Kunde allotments, including using the CNF-approved guidelines for stock pond maintenance and management and actions to prevent the spread of chytrid fungus.

## INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (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 (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 implemented by you so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. You have a continuing duty to regulate the activity covered by this incidental take statement. If you (1) do not require any 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, and/or (2) do not retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

### AMOUNT OR EXTENT OF TAKE

We anticipate that incidental take of Chiricahua leopard frog will be difficult to detect because incidental take of actual species numbers may be difficult to detect due to the small size of eggs, tadpoles, and frogs; finding a dead or impaired specimen is unlikely; losses may be masked by seasonal fluctuations in numbers; or drought or excessive monsoons can alter habitat quality and quantity.

Because Chiricahua leopard frogs are known to occur on the Papago allotment (deep pools in O'Donnell Creek in the enclosure), and livestock will be herded across O'Donnell Creek bi-annually for the next 10 years, we anticipate take per the following, for the life of the plan:

1. Direct mortality to egg masses, tadpoles, and frogs during livestock crossing times at O'Donnell Creek when the creek is actively flowing (estimated to be every second or every third year) due to trampling and possible ingestion.
2. Harm through mortality of frogs by accidental introduction of chytridiomycosis by livestock crossing O'Donnell Creek when the creek contains water (puddles) or there is active flow (estimated to be every second or every third year).

## EFFECT OF THE TAKE

In this BO, we determined that this level of anticipated take is not likely to result in jeopardy to the Chiricahua leopard frog.

## REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

The following reasonable and prudent measures are necessary and appropriate to minimize take of Chiricahua leopard frog. In order to be exempt from the prohibitions of section 9 of the Act, you must comply with their accompanying terms and conditions in regard to the proposed action. These terms and conditions are nondiscretionary and implement the reasonable and prudent measures as described. These reasonable and prudent measures and their terms and conditions are in addition to those in our 2002 BO. They apply to the Kunde and Papago allotments only.

1. Methods will be used to minimize Chiricahua leopard frog mortality during wet crossings at O'Donnell Creek.

1.1 Keep livestock moving across the creek at the selected crossing site in as narrow a line as possible to impact as small a part of the creek as possible.

2. Personnel will be educated about chytridiomycosis existence and transmission prevention.

2.1 Clearly written information and well-defined operational instructions will be given to all field and contract personnel and all permittee(s) involved to reduce the introduction and spread of chytridiomycosis.

## CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the ESA direct Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendation provided here does not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for the Chiricahua leopard frog. This recommendation is in addition to those provided in the 2002 BO. In furtherance of the purposes of the ESA, we recommend implementing the following action:

- Coordinate with us and AGFD a discussion of impacts that could result from reconfiguring the East and Roundup pastures of the Papago allotment so moving livestock across the O'Donnell Creek enclosure and crossing the creek is not necessary.

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

**Gila topminnow (*Poeciliopsis occidentalis occidentalis*)**

**STATUS OF THE SPECIES**

The status of the Gila topminnow remains as described in the 2002 BO.

**ENVIRONMENTAL BASELINE**

A clear and detailed Environmental Baseline for the Gila topminnow was written for the 2002 BO (U.S. Fish and Wildlife Service 2002a). Your BAE provides updated soil and allotment condition and information, supplementing that environmental baseline. These documents are included here by reference. We note that the Kunde allotment, while permitted for livestock grazing, has not experienced permitted livestock use for seven years (1996 to 2003), and range and watershed conditions continued to move in an upward trend. The baseline condition for this consultation reflects an improved condition in the absence of livestock grazing from 1996 to 1998/99. Redrock Canyon drains from the watershed around and on the San Rafael, Kunde, and Seibold allotments; Cienega Creek drains from the watershed on the Papago allotment.

As one of only two remaining natural population sources of Gila topminnow on Federal lands, Redrock Canyon is very important in the survival and recovery of the species. The population of Gila topminnow in Redrock Canyon has declined in recent years. This may be an artifact of lower precipitation and decreased surface flows. It is likely that Gate Spring dried completely in 1996 and eliminated both Gila topminnow and longfin dace that were present at that time. In addition, the Gila topminnow population at The Falls has been relatively low in many of the past years and Gila topminnow have not been documented as occurring above The Falls since 1993. The proportion of mosquitofish to topminnow is increasing in the Cott Tank drainage; Cott Tank itself was naturally breached in 2003 by the monsoons. There are no plans for rebuilding it due to its history of harboring nonnative aquatic species that negatively affect Gila topminnow further downstream in the canyon (Rick Gerhart, pers. comm. 2003).

Recent water developments have been created with great sensitivity towards not providing habitat or dissemination opportunities for nonnative aquatic species. Other, existing earthen stock tanks, unless treated for removal of nonnative aquatic species, will likely continue to harbor and spread any existing nonnative aquatic species to other tanks and creeks.

The recently (November 2003) documented Gila topminnow population occurs in O'Donnell Creek, in that portion that crosses private property owned by the Nature Conservancy (TNC), upstream from the CNF boundary. The habitat is a series of pools separated by dry reaches or

shallow runs through herbaceous vegetation. Overstory riparian vegetation is currently limited, having burned in the 2002 Ryan Fire. Concrete detention dams (grade control structures) are located both upstream and downstream of habitats on the CNF. Topminnows were found in a pool immediately below the upper dam on TNC property. On the CNF portion of the drainage, a livestock enclosure has been in place since 1997 (U.S. Forest Service 2003a).

On October 30, 2003, Jerry and Sally Stefferud collected and identified several Gila topminnows from a pool in O'Donnell Creek on TNC property. Additional specimens were collected at the same location and identified by AGFD on November 10, 2003. The reach of the creek where topminnows are now found was successfully treated in 2002 with a piscicide (anamycin) to remove nonnative green sunfish. The origin of the fish now extant in the creek is unknown, but genetic analysis of the specimens collected by AGFD is pending (U.S. Forest Service 2003b).

## EFFECTS OF THE ACTION

The effects of the proposed action remain the same as those described in the 2002 BO, with the exception of the following:

### Kunde Allotment

- A 10-year term grazing permit for 31 cattle year long (CYL) will be issued.

This is a reduction from 53 CYL from the action evaluated in the 2002 BO. Fewer livestock will lead to reduced grazing pressure, and an expected increase in soil and watershed condition, lower utilization rates, and improvement of the condition and vigor of vegetation.

- The Redrock pasture will be closed to livestock grazing.

This is anticipated to reduce impacts to the Gila topminnow and help improve riparian and watershed conditions in Redrock Canyon, aiding recovery of the species.

- Proposed range projects for the Papago allotment are planned.

No range projects were planned in the 2002 BO consultation. The now-proposed range projects (fences, pipelines, troughs, drinkers, stock tanks, etc) will aid in redistribution of livestock on the allotments. Areas near stock tanks are typically on flat ground and often devoid of vegetation because livestock congregate close to the tanks for long periods of time. The addition of water developments in more distant portions of the allotments is anticipated to attract livestock into those areas, spreading out the trampling and other grazing effects over the allotment more evenly than before. Livestock are anticipated to remain and feed longer in these different areas where water is present, distributing forage utilization over the allotment more evenly than before. This is anticipated to aid in creating an upward trend toward more positive range conditions over time. Fencing (gap or enclosure) to protect water sources (springs, creeks, etc.) will aid in keeping livestock out of the more sensitive areas and help disperse effects from congregating livestock

more evenly over the pastures/allotments. Livestock will not enter pastures until range projects in those pastures are functional.

Effects to Gila topminnow from the proposed action differ in degree for Cienega Creek and Redrock Canyon, but are additive when effects are viewed for the species as a whole. Even though the Redrock pasture (in the Kunde allotment) will be excluded from livestock grazing, the seriously imperiled status of the Gila topminnow, together with the degraded environmental baseline for the entire Redrock Canyon watershed, make even small, adverse effects to the species and its habitat a serious concern. The status of this species is such, and its habitat loss so severe, that recovery is only a long-term vision, and the short-term goal is simply to prevent the extinction of the species within the Gila basin.

Analysis of the effects of livestock grazing on fish and fish habitat requires looking at subtle, long-term, gradual changes in watershed functions, riparian and aquatic communities, and stream channel morphology. The long-term additive aspect of livestock grazing and its associated operations, combined with the short-term limited data available on range condition, fish, and fish habitat, make a purely empirical analysis of the effects of grazing and grazing management difficult and often misleading. Extrapolations of hydrological 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 grazing and grazing management. The 2002 BO discusses this in detail and provides references.

#### Papago Allotment - Effects to Gila topminnow in the Cienega Creek watershed

The headwaters of Cienega Creek begin just above Papago Spring on the Papago allotment and travel about 2.5 miles to the CNF boundary. Except at Papago Spring, the CNF portion of Cienega Creek and its small tributaries are ephemeral. After crossing the CNF boundary, the creek travels north across BLM, State, and private lands, then turns west to the Santa Cruz River. Perennial water, and occupied Gila topminnow habitat, occurs about 11 miles downstream from the allotment.

The short, ephemeral portion of Cienega Creek on the allotment (2.5 miles); the 11-mile distance between the allotment and the reach of Cienega Creek occupied by Gila topminnow; the now above-average condition of much of the riparian vegetation along Cienega Creek in different locations; and the slowly increasingly positive condition of the riparian and aquatic population in the occupied portion of Cienega Creek combine to lessen the adverse effects of soil compaction, erosion, sedimentation, and other negative effects created by the proposed action and the poor conditions in the upper watershed.

### Papago Allotment - Effects to Gila topminnow in O'Donnell Creek

Gila topminnow have not been documented on the CNF portion of O'Donnell Creek or downstream, but suitable habitat exists on the CNF portion and it is possible that the species could colonize it during periods of appropriate water flow. We assume that Gila topminnow will be present on the CNF portion of the creek during times of water flow over the 10-year term of the permit.

O'Donnell Creek is fenced to exclude livestock from the creek (see maps included in the BAE), but livestock will be actively herded across the enclosure during pasture rotations twice a year, for the next 10 years (life of the permit). The selected crossing site is a gravel ravine with a bedrock substrate in the creek and lack of perennial flow during dry months. This choice is anticipated to greatly minimize any sedimentation and bank erosion caused by livestock crossing the creek. Livestock will not be allowed to linger within the enclosure; they will be actively herded and gates will be secured immediately after crossings. Direct and indirect effects to topminnow could occur during those times when livestock are herded across the creek during pasture changes, water is actively flowing in the stream channel (wet crossings), and fish are present at the crossing site. Wet crossings may occur every second or third year, depending on pasture rotation schedules and precipitation patterns. Direct effects may occur during wet crossings as a result of trampling or ingestion of very small fry by livestock. Indirect effects related to sedimentation and bank disturbance may occur, but are expected to be greatly minimized because of the bedrock substrate and location of the crossing site (downstream from the TNC land). Effects will be of short duration; four to five days per event or less. Reductions in livestock numbers, pasture rotation, and range projects for the next 10 years are anticipated to maintain or improve conditions on the O'Donnell Creek watershed.

### Kunde Allotment - Effects to Gila topminnow in Redrock Canyon

Adverse effects from livestock grazing and associated management operations contribute to the impaired hydrological and sediment regimes of Redrock Canyon on the Kunde allotment. Increasing soil compaction and erosion, loss of cryptobiotic crusts, decreases in vegetation cover, and decreased infiltration over time contribute to a poor watershed condition, resulting in "flashier" and more erosive streams defined by prolonged low flows with decreased volumes and shortened flood events with higher volumes (Gifford and Hawkins 1978, Weltz and Wood 1994, Harper and Marble 1988, Orodho *et al.* 1990, Schlesinger *et al.* 1990, Elmore 1992, Johnson 1992, Waters 1995, MacAuliffe 1997).

In Redrock Canyon on the Kunde allotment, Gila topminnow occur at three sites protected by grazing enclosures (Pig Spring, The Falls, and Gate Spring) and have been documented farther up and lower down in the canyon in other locations, in various years, and at various numbers. About 1.75 miles of the lower portions of Redrock Canyon (in the Holding, East, and West Redrock pastures) will experience direct livestock grazing effects, with the remainder of Gila topminnow occupied habitat on the Kunde allotment (about 2.5 miles) excluded from livestock grazing by the closure of Redrock pasture (and the three enclosures as listed above) to livestock grazing.

Livestock grazing and operations, including habitat disturbance during reconstruction or maintenance of existing cross-channel fences; bank breakdown (sedimentation increase); maintenance of degraded conditions in intermittent or ephemerally flowing migration areas between subpopulations of Gila topminnow; reduction in surface flows due to water developments and watershed degradation; alterations in the hydrograph that result in flashier streamflows; spread of predatory and competitive nonnative aquatic species through livestock waters; and maintenance of watershed conditions that result in unstable stream channel canyons, all result in continuing adverse effects to Gila topminnow and its habitat.

In addition to the physical alterations of the watershed and stream channels, a number of nonnative aquatic species exist in the canyon. Nonnative aquatic species adversely affect native fish communities through competition and predation (Courtenay and Stauffer 1984, Meffe 1985, Marsh and Brooks 1989, Propst *et al.* 1992, Blinn *et al.* 1993, Douglas *et al.* 1994). Gila topminnow are particularly vulnerable to adverse effects from nonnative aquatic species (Miller 1961, Meffe 1983, 1985). Nonnative fishes recorded in Redrock Canyon include western mosquitofish, largemouth bass (*Micropterus salmoides*), green sunfish (*Lepomis cyanellus*), and bluegill (*Lepomis macrochirus*) (Rinne *et al.* 1980, Brooks 1985, Stefferud and Stefferud 1994). A number of nonnative riparian and aquatic plants present in Redrock Canyon are believed to have detrimental effects on stream channels and fish habitat (Stromberg and Chew 1997). These include salt cedar (*Tamarix* spp), Bermuda grass (*Poaceae* family), rabbit's foot grass (*Polypogon monspeliensis*), and fountain grass (*Pennisetum* spp.).

The closure of the Redrock pasture to livestock grazing will aid in minimizing some adverse effects in the canyon. The creation and maintenance of several important exclosures and other livestock management measures taken during the last nine years have helped create improved conditions for Gila topminnow. Positive effects from exclosure use result when fences are rigorously maintained; we assume that is a condition of the AMPs and AOIs. Fences on virtually all livestock exclosures at one time or another become damaged due to storms, fire, vandalism, or other causes, resulting in occasional trespass cattle. As a result, we anticipate that livestock will occasionally gain access to the Redrock Canyon exclosure when fences are down. Livestock use in exclosures can inhibit formation or restoration of suitable listed species' habitat, degrade existing and occupied habitat, and may result in take due to trampling or ingestion. Many existing earthen stock tanks within the allotments are used by livestock and can contribute to the further and continual dissemination of nonnative aquatic species detrimental to Gila topminnow, with continuing negative effects to the species.

## CUMULATIVE EFFECTS

Cumulative effects remain the same as consulted on in the 2002 BO.

## CONCLUSION

After reviewing the current status of the Gila topminnow, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action, as described for these allotments, is not likely to jeopardize the continued existence of the Gila topminnow. Critical habitat has not been designated for this species; therefore, none will be affected.

We base our conclusion on the reasons above and because:

1. The Redrock pasture is closed to grazing and three source population sites are protected by exclosures.
2. Range projects are either currently functional, or will be made so, before livestock are allowed in pastures.
3. The documented Gila topminnow population in O'Donnell Creek is on TNC property located upstream from the livestock crossing site.

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 and our 2002 BO, including any Conservation Measures that were incorporated into the project design.

## INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined 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 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 you 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. You have a continuing duty to regulate the activity covered by this incidental take statement. If you (1) do not assume and implement the terms and

conditions or (2) do not 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, you (or the applicant) 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 TAKE

We anticipate that incidental take of Gila topminnow will be difficult to detect because incidental take of actual species numbers may be difficult to detect due to the small size of fish; finding a dead or impaired specimen is unlikely; losses may be masked by seasonal fluctuations in numbers; or drought or excessive monsoons can alter habitat quality and quantity.

Incidental take is not anticipated to occur from the proposed livestock grazing on the Papago allotment in Cienega Creek.

Incidental take is anticipated to occur on the Papago allotment at the O'Donnell Creek crossing site when wet crossings are made when Gila topminnow are present, and this is anticipated to occur in an irregular pattern (maybe every second or third year) depending on allotment conditions, forage, and pasture rotation schedules. Direct take is expected to occur (trampling or ingestion of very small fry) during wet crossings. Because the documented Gila topminnow population is on TNC property (upstream from the crossing site), indirect take is not anticipated to occur.

Incidental take on the Kunde allotment is expected to occur both as direct mortality of individual Gila topminnow and as indirect loss resulting from habitat modification and destruction of occupied Gila topminnow habitat in Redrock Canyon outside the Redrock pasture enclosure. This stretch of the creek runs through the Holding pasture of the Kunde allotment and the East and West pastures on the Seibold allotment.

Direct mortality may occur during reconstruction or maintenance of existing cross-channel fences, during trampling of occupied habitat by livestock, and incidental consumption of topminnow during livestock watering. Indirect take may occur through habitat alteration and loss due to grazing in Redrock Canyon in any occupied Gila topminnow habitat in the Holding (Kunde allotment) and East and West pastures (Seibold allotment), grazing or bank breakdown (sedimentation increase) during livestock operations, or in enclosure areas when fences are periodically washed out, cut or damaged; dissemination of predatory and competitive nonnative aquatic species through livestock waters; maintenance of degraded conditions in intermittent or ephemerally flowing migration areas between subpopulations of Gila topminnow; reduction in surface flows due to water development and watershed degradation; alterations in the hydrograph that result in flashier streamflows; and maintenance of watershed conditions that result in an unstable stream channel in Redrock, Lampshire, or Oak Grove Spring canyons.

The anticipated level of take cannot be quantified as numbers of individual fish. Gila topminnow are a short-lived, highly fecund species whose natural cycle includes large, rapid fluctuations that make population estimates difficult to obtain and that mask changes due to take from human actions. In addition, dead fish are seldom found due to their small size and rapid consumption by scavengers. The level of anticipated take will be quantified differently depending upon the action; i.e. 1) for construction, development, or maintenance actions, and 2) for ongoing livestock grazing and its management.

1. For construction, development, or maintenance projects (e.g., reconstruction or maintenance of existing fences across the stream channel or existing road and water development or maintenance in connection with grazing activities) in Redrock Canyon, we anticipate that direct take of Gila topminnow will occur at a level that will result in no more than 20 dead or dying fish of any species being observable near the activity, or within 600 yards downstream of the activity, during implementation or within three hours following completion of a project. Finding more than 20 dead or dying fish of any species in the vicinity of projects having direct effects to occupied Gila topminnow habitat will indicate effects to water quality or other habitat characteristics over and above that anticipated herein.
2. For livestock grazing and management, take will be considered to have been exceeded if any one of the following conditions occur:
  - a) The enclosure fence is cut, down, open, or non-functional for more than two weeks while permitted livestock are in a pasture adjacent to the enclosure, or for more than three months in any given year if livestock are in a pasture that is not adjacent to the enclosure (the concern in regard to the latter scenario is that the potential exists for incidental take by trespass cattle, because fences are not inviolate), or
  - b) livestock grazing occurs within the Redrock pasture enclosure at a level resulting in more than five percent utilization of woody riparian species (measured as percentage of apical meristems within six feet of the ground grazed) and trampling, chiseling, or other physical impact by livestock on more than 10 percent of the alterable streambanks by length. These levels of riparian forage use and effects to stream banks would be an indicator of significant livestock use within the enclosure.

Exceeding these levels of utilization and trampling will result in incidental take and adverse effects over and above that anticipated herein.

If, during the course of the action, the amount or extent of the anticipated incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. You must immediately provide an

explanation of the causes of the taking and review with us the need for possible modification of the reasonable and prudent measures.

### **EFFECT OF THE TAKE**

In this biological opinion, we find the anticipated level of incidental take is not likely to result in jeopardy to the Gila topminnow because:

1. The Redrock pasture (about 2.5 miles of Redrock Canyon and occupied Gila topminnow habitat) is closed to grazing and three sources of Gila topminnow are maintained in fenced enclosures on the Kunde allotment (Pig Spring, The Falls, and Gate Spring). Fences and enclosures will be rigorously maintained.
2. The small (2.5 miles) and ephemeral portion of Cienega Creek on the Kunde allotment along with its distance to the occupied Gila topminnow population (11 miles downstream) makes it unlikely that the anticipated downstream adverse effects would impact that population.
3. The pool(s) supporting Gila topminnow on TNC land is upstream from the O'Donnell Creek crossing site.
4. Your efforts are continuing to eliminate nonnative aquatic species and their spread on these allotments and on the CNF, per the 2002 BO.

### **REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS**

We believe the following reasonable and prudent measure(s) are necessary and appropriate to minimize take. In order to be exempt from the prohibitions of section 9 of the Act, you must comply with them and their terms and conditions, which implement the reasonable and prudent measures and outline required reporting/monitoring requirements. These reasonable and prudent measures and their terms and conditions (which are non-discretionary) replace those in our 2002 BO for the Gila topminnow as they apply to the Kunde and Papago allotments. Terms and conditions for the topminnow in the 2002 BO, as they apply to the Kunde and Papago allotments, are now part of the proposed action. The terms and conditions for the Gila topminnow in the 2002 BO still apply as written to the Crittenden, Seibold, and San Rafael allotments.

1. Conduct all proposed actions in ways that minimize direct mortality to, or harm of, Gila topminnow.
  - 1.1 Inspect and maintain the enclosures, especially the Redrock pasture enclosure, three times a year. Inspection reports from the permittees may be used to document this term and condition. The permittees will report their inspection and maintenance work annually. Livestock will be removed from any enclosure immediately upon the permittee or Forest personnel learning of such an event.

Notify us of your knowledge of any enclosure fence damage and any livestock intrusion into the enclosures within 48 hours of your knowledge of such an event. Notification may be by telephone, electronic transmission, facsimile, or letter. Records will be maintained of any downed or damaged enclosure fencing and incidents of livestock intrusion within any enclosure. Reports shall include dates of observations, sightings of any livestock use, number of livestock, area of use, and any other pertinent information. Copies of these reports will be included in the annual report you send to us.

2. Conduct activities to minimize the loss and alteration of occupied Gila topminnow habitat.
  - 2.1 All reasonable effort shall be made to minimize channel and floodplain alteration during any work on any fences, especially fences in Redrock Canyon and on O'Donnell Creek. A brief, written report shall be submitted to us and can be included in the annual monitoring report. The report shall include photographs of the project area before and after project implementation.
3. Monitor mortality of any fish species in the vicinity of projects in or adjacent to enclosures.
  - 3.1 During any fence construction and maintenance or other projects that involve work in, or that would cause direct disturbance to, reaches of occupied Gila topminnow, and upon completion of these projects, you shall monitor for and document the presence of dead fish or dying fish in and for 600 yards downstream of the activity area. You will notify us immediately upon detection of any dying fish of any species, including numbers by species.

### **CONSERVATION RECOMMENDATIONS**

Sections 2(c) and 7(a)(1) of the ESA direct Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for Gila topminnow. In furtherance of the purposes of the ESA, we recommend implementing the following actions which are in addition to those in the 2002 BO:

1. Permanently combine allotments and permits to create greater flexibility in livestock management on increased acres.
2. Assist us in the implementation of the Gila topminnow recovery plan, after that plan is finalized.

3. Coordinate with AGFD and us and create and submit a plan or outline for a rotational inspection of Forest water projects or impoundments (tanks, stock ponds, drinkers, etc.) for nonnative aquatic species in the Cienega Creek and Redrock watersheds on Forest lands.
4. Coordinate with AGFD and us and submit a plan or outline for rotational treatment(s) of those tanks found to harbor nonnative aquatic species, at least every two years, aimed at elimination of nonnative species.

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

### **Lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*)**

#### **STATUS OF THE SPECIES**

The status of the lesser long-nosed bat remains as described in the 2002 BO.

#### **ENVIRONMENTAL BASELINE**

Agaves are scattered across the two allotments and exist in varying numbers and densities on the watershed. Lesser long-nosed bat roosts are not known from the Kunde and Papago allotments, but there is always the possibility that an undiscovered roost of any size occurs in the mountains. Several known roost and occurrence sites are documented within 11 miles of these allotments. In their work, Ober *et al.*(2000) found that 11 miles is a typical roost-to-forage distance for the bats they studied in southeastern Arizona. Night flights from maternity colonies to flowering columnar cacti have also been documented in Arizona at 15 miles, and in Mexico at 25 miles and 38 miles (one way)(Dalton *et al.* 1994; U.S. Fish and Wildlife Service 2002a). Based on these works, we expect that lesser long-nosed bats forage on agaves in the allotments.

#### **EFFECTS OF THE ACTION**

Effects to lesser long-nosed bats remain as described in the 2002 BO.

#### **CUMULATIVE**

Cumulative effects to lesser long-nosed bats remain as described in the 2002 BO.

#### **CONCLUSION**

After reviewing the current status of the lesser long-nosed bat, the environmental baseline for the project area, the effects of the proposed action, and cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the lesser long-

nosed bat. No critical habitat has been designated for this species; therefore, none will be affected.

We base our conclusion on the reasons above and because:

1. You are actively monitoring herbivory on flowering agaves while livestock are in pastures supporting agaves during the bolting season.
2. No roost sites for this species are known to exist on the allotments.

### **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (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 (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.

### **AMOUNT OR EXTENT OF INCIDENTAL TAKE**

Incidental take for this species is not anticipated to occur because no lesser long-nosed bat roosts are known to occur in the action area, measures are in place to ensure any loss of agaves to range projects does not exceed one percent, and the species is highly mobile and can use the thousands of discrete food resources surrounding and on the allotments.

### **CONSERVATION RECOMMENDATIONS**

Sections 2(c) and 7(a)(1) of the ESA direct Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendation provided here does not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for the lesser long-nosed bat. In furtherance of the purposes of the ESA, we recommend implementing the following action, which is in addition to those as described in the 2002 BO:

- Explore and work toward finding ways to fund, aid, or establish research or study projects for this species that further recovery.

In order for us to 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.

### **Gila chub (*Gila intermedia*) with critical habitat - Conference for Proposed Species**

#### **STATUS OF THE SPECIES AND CRITICAL HABITAT**

The status of the Gila chub remains as described in the 2002 BO.

#### **ENVIRONMENTAL BASELINE**

The environmental baseline remains as described in the 2002 BO, with the following exceptions:

1. The movement of livestock twice annually across O'Donnell Creek was not included in the 2002 BO and is consulted on herein.
2. In the summer of 2002, the Ryan Fire occurred in the O'Donnell Creek watershed; minor damage to the exclosure fence occurred but was repaired with a minimum of ground disturbance (Bill Edwards, pers. comm. 2003).

#### **EFFECTS OF THE ACTION**

Direct effects are possible to Gila chub during those times when livestock are "pushed" across O'Donnell Creek when stream flow is active and fish are present at the crossing. The crossing site, a narrow portion of the creek, is a gravel ravine with a bedrock substrate to the creek side on the west side and a low bank supporting vegetation on the east side of the crossing site. Pasture rotation schedules are anticipated to result in a mix of dry and wet time crossing, with wet crossings made every second or every third year. Livestock will not be allowed to linger during the exclosure crossing; they will be actively herded across and gates will be immediately secured. Because the crossing site is primarily a gravel ravine with a bedrock substrate; very little bank damage or sedimentation is anticipated to occur from this action.

#### **ANALYSIS OF EFFECTS TO CRITICAL HABITAT**

Proposed Gila chub critical habitat on O'Donnell Creek is fenced to exclude livestock grazing, but livestock will be crossing a narrow portion of the creek twice a year, in varying seasons, for the life of this consultation (10 years). This narrow portion of the creek is a gravel ravine with a bedrock substrate to the creek on the west side; a low, vegetated bank on the east side will be degraded during the crossings, with some sedimentation and bank breakdown.

Livestock will not be allowed to linger during the enclosure crossing; they will be actively herded across and gates immediately secured. The crossing site is a gravel ravine with a bedrock substrate to the creek; very little bank damage or sedimentation is anticipated to occur from this action. Livestock crossing O'Donnell Creek during wet times of the year (when fish are likely to be present at the crossing site due to active stream flow or puddles) will not occur every year; it will occur every second or third year, depending on pasture rotation schedules, which depend on variables not under control of the permittee(s). Dry crossings are anticipated to result in lessened effects to Gila chub habitat. Gila chub in O'Donnell Creek survive dry times of the year in the deep pools upstream of the crossing site that persist year round and will not be affected by livestock crossings.

### CUMULATIVE EFFECTS

Cumulative effects remain as described in the 2002 BO.

### CONCLUSION

After reviewing the current status of Gila chub, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is our conference opinion that the action, as proposed, is neither likely to jeopardize the continued existence of the proposed endangered Gila chub, nor likely to adversely modify or destroy proposed Gila chub critical habitat.

We based our conclusion on the following, in addition to the rationale presented in our 2002 BO:

- On the Papago allotment, that portion of O'Donnell Creek which is occupied Gila chub habitat and proposed critical habitat is fenced to exclude livestock grazing. The only exception will be the movement of livestock across the creek bi-annually, which is expected to minimally affect the chub and its habitat.
- A total of 75 cattle (in groups of about 20 at a time) will cross at a narrow portion of O'Donnell Creek, twice a year, every year, at one specific crossing. They will be actively herded ("pushed") between the East and Roundup pastures on the Papago allotment by crossing O'Donnell Creek and its enclosure fence. The crossing site is a gravel ravine with a bedrock substrate to the creek; very little bank damage or sedimentation is anticipated to occur from this action. It may take up to four or five days to complete the push; if it can be accomplished in less time, it will be. Livestock will not be allowed to linger during the enclosure crossing; they will be actively herded across and gates immediately secured. Depending on the pasture rotation, in some years livestock may be pushed across the enclosure and creek during dry times (deep pools upstream; water not flowing in the creek) or wet times (pools upstream connected, water flowing through the creek, and/or puddles at the crossing that support fish). "Wet" crossings may occur every

second or third year, depending on allotment conditions, forage, and pasture rotation schedules.

- Gila chub existing in O'Donnell Creek are most likely to be present at the livestock crossing site only during wet times (active stream flow and puddles). Fish will move to the upstream, deep pools of the creek each year as the stream flow diminishes and dries up at the crossing site. Fish may be present in the creek every year, but these will only be vulnerable to trampling or accidental ingestion if they are at the crossing site when stream flow is continuous and livestock are being pushed at that particular time of year.
- Effects to proposed critical habitat in Cienega Creek downstream of the Papago allotment are expected to be insignificant due to the distance (11 miles) between the allotment and proposed critical habitat, and pasture rotations and other elements of the proposed action that should result in improved range and watershed condition.

### INCIDENTAL TAKE STATEMENT

The following incidental take statement replaces the take statement for the Gila chub in the 2002 BO. Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is further defined (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 (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.

If this conference opinion is adopted as a biological opinion following listing, these measures, with their implementing terms and conditions, will be nondiscretionary, and must be undertaken by you so that they become binding conditions of any grant or permit issued to any applicants, as appropriate, for the exemption in section 7(o)(2) to apply. You have a continuing duty to regulate the activity covered by this incidental take statement. If you (1) do not assume and implement the terms and conditions or (2) do not require any applicants 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. To monitor the impact of incidental take, you 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 TAKE

We anticipate that incidental take of Gila chub will be difficult to detect because incidental take of actual species numbers may be difficult to detect due to the small size of eggs and fish; finding a dead or impaired specimen is unlikely; losses may be masked by seasonal fluctuations in numbers; or drought or excessive monsoons can alter habitat quality and quantity.

Incidental take of Gila chub is anticipated as a result of twice-a-year livestock crossings of occupied habitat on O'Donnell Creek, Papago allotment, and from construction or maintenance activities, such as work on the enclosure fence or other activities in that same reach.

1. Gila chub within the enclosure may be incidentally taken through direct mortality from trampling or ingestion (when very small) during bi-annual livestock crossings of O'Donnell Creek when fish occur at the crossing (wet crossings). Incidental take will be considered to be exceeded if the following conditions occur:
  - a. Livestock grazing occurs within the O'Donnell Creek enclosure at a level resulting in more than five percent utilization of woody riparian species (measured as percentage of apical meristems within six feet of the ground grazed) and trampling, chiseling, or other physical impact by livestock on more than 10 percent of the alterable streambanks by length. These levels of riparian forage use and effects to stream banks would be an indicator of significant livestock use within the enclosure. Exceeding these levels of utilization and trampling will result in incidental take and adverse effects over and above that anticipated here; or
  - b. The enclosure fence is cut, down, open, or non-functional for more than two weeks while permitted livestock are in a pasture adjacent to the enclosure, or for more than three months in any given year if livestock are in a pasture that is not adjacent to the enclosure (the concern in regard to the latter scenario is that the potential exists for incidental take by trespass cattle, because fences are not inviolate).
2. Gila chub within the O'Donnell Creek enclosure may be incidentally taken through direct mortality during construction, development, or maintenance projects (e.g., reconstruction or maintenance of existing fences across the stream channel or existing road and water development or maintenance in connection with grazing activities) that involve work in, or that would cause direct disturbance to, O'Donnell Creek within the enclosure under wet conditions. Incidental take will be considered to be exceeded if the following conditions occur:
  - a. More than 20 dead or dying fish of any species are observed near the activity, or within 600 yards downstream of the activity, during implementation or within

three hours of completion. Finding more than 20 dead or dying fish of any species in the vicinity of projects having direct effects to occupied Gila chub habitat will indicate effects to water quality or other habitat characteristics over and above that anticipated herein.

#### EFFECT OF INCIDENTAL TAKE

In this biological opinion, we find the anticipated level of incidental take is not likely to result in jeopardy to the Gila chub because:

1. Livestock crossing O'Donnell Creek during wet times of the year (when fish are likely to be present at the crossing) does not occur every year; it will occur every second or third year, depending on pasture rotation schedules, which depend on variables not under control of the permittee(s).
2. Incidental take is not anticipated during dry crossings. Gila chub in O'Donnell Creek survive dry times of the year in the deep pools upstream of the crossing site that persist year round and these pools will not be made accessible to livestock.
3. Effects from the proposed action (including the livestock crossing activity) are anticipated to be low; thus, incidental take is anticipated to be low.

The prohibitions against taking Gila chub found in section 9 of the Act do not apply until the species is listed; however, we recommend you implement the following reasonable and prudent measures. If this conference opinion is adopted as a biological opinion following listing, with their implementing terms and conditions, will be non-discretionary.

#### REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

The following reasonable and prudent measures are necessary and appropriate to minimize take of the Gila chub. In order to be exempt from the prohibitions of section 9 of the Act, you must comply with their accompanying terms and conditions in regard to the proposed action. These terms and conditions are nondiscretionary and implement the reasonable and prudent measures as described.

1. Conduct all proposed actions that may affect the O'Donnell Creek enclosure in ways that minimize direct mortality to, or harm of, Gila chub.
  - 1.1 Inspect and maintain the enclosure on O'Donnell Creek three times a year. Inspection reports from the permittees may be used to document this term and condition. The permittees will report their inspection and maintenance work to the appropriate district annually. Livestock will be removed from the enclosure immediately upon the permittee learning of such an event. Notify us of your

knowledge of any enclosure fence damage and any livestock intrusion into the enclosures within 48 hours of your knowledge of such an event. Notification may be by telephone, electronic transmission, facsimile, or letter. Records will be maintained of downed or damaged enclosure fencing along O'Donnell Creek and incidents of livestock intrusion within the riparian enclosure. Reports should include dates of observations, sightings of any livestock use, number of livestock, area of use, and any other pertinent information. Copies of these reports will be included in the annual report you send to us.

2. Conduct activities to minimize the loss and alteration of occupied Gila chub habitat.
  - 2.1 All reasonable effort shall be made to minimize channel and floodplain alteration during any work on the fence enclosure at O'Donnell Creek. A brief, written report shall be submitted to us within 60 days of completion of fence or creek side project activity. The report shall include photographs of the project area before and after project implementation.
3. Monitor mortality of any fish species in the vicinity of projects on O'Donnell Creek.
  - 3.1 During any fence construction and maintenance or other projects that involve work in, or that would cause direct disturbance to, reaches of O'Donnell Creek occupied by Gila chub, and upon completion of these projects, you shall monitor for and document the presence of dead fish or dying fish in and for 600 yards downstream of the activity area. You will notify us immediately upon detection of any dying fish of any species, including numbers by species.
  - 3.2 Records will be maintained of down or damaged enclosure fencing along O'Donnell Creek and incidents of livestock intrusion with the riparian areas. Reports should include date of observations, sightings of livestock use, number of livestock, areas of use, and any other pertinent information. Copies will be sent to us annually. A plan for monitoring levels and types of anticipated take should be coordinated and created with us and AGFD and submitted to us in your 2003 report.

### **CONSERVATION RECOMMENDATIONS**

Sections 2(c) and 7(a)(1) of the ESA direct Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendation provided here does not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibilities for the Gila chub. In furtherance of the purposes of the ESA, we recommend implementing the following action in addition to those described in the 2002 BO:

- If the Gila chub is listed, actively assist in the development and implementation of a recovery plan for the species.

In order for us to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed or proposed species, we request notification of implementation of any conservation actions.

This concludes the conference for the effects of proposed grazing on Gila chub on the Kunde and Papago allotments. You may ask us to confirm the conference opinion as a biological opinion issued through formal consultation if the proposed species is listed. The request must be in writing. If we review the proposed action and find there have been no significant changes in the action as planned or in the information used during the conference, we will confirm the conference opinion as the biological opinion for the project and no further section 7 consultation will be necessary.

After any subsequent adoption of this conference opinion as a biological opinion, the Federal agency shall request reinitiation of consultation if: 1) the amount or extent of incidental take is exceeded, 2) new information reveals effects of the agency action that may affect the species in a manner or to an extent not considered in the conference opinion, 3) the agency action is subsequently modified in a manner that causes an effect to the species that was not considered in this opinion, or 4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in the conference opinion for the Gila chub does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the proposed action will be reviewed to determine whether any take of the proposed species has occurred. Modifications of the opinion and the incidental take statement may be appropriate. No take of this species may occur between the listing of the species and the adoption of this conference opinion as a biological opinion, or the completion of a subsequent formal consultation.

### **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, Suite 113, Mesa, Arizona 85202 (telephone: 480/835-8289) 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.

**REINITIATION AND CLOSING STATEMENT**

This concludes formal consultation and conference on the proposed action outlined in the reinitiation 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.

Conclusions for species not addressed herein in regard to the Kunde and Papago allotments and for all species on other allotments remain the same as presented in our 2002 BO. We appreciate your efforts on behalf of listed species and the public lands they inhabit.

Contact Thetis Gamberg at (520) 670-4619 or Jim Rorabaugh at (602) 242-0210 (x 238) of my staff with further concerns or questions.

Sincerely,

/s/ Steven L. Spangle  
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)  
Field Supervisor, Fish and Wildlife Service, Albuquerque, NM  
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

John Kennedy, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ  
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ

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## APPENDIX A: CONCURRENCES

You determined that effects from the proposed action may affect, but are not likely to adversely affect, the following listed species, per the 2002 grazing guidance criteria. We concur and offer the following reasons (by species):

### **Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*)**

We listed the Sonora tiger salamander as endangered, without critical habitat, in a Federal Register notice (62 FR 665) dated January 6, 1997 (U.S. Fish and Wildlife Service 1997a). A recovery plan was completed last year (U.S. Fish and Wildlife Service 2002d).

Although Sonora tiger salamanders have not been documented from the action area, salamanders do occur within the San Pedro 5<sup>th</sup> code watershed. A part of the Papago allotment lies within this watershed. Ten (current or historical) localities (stock tanks) occur on the adjacent San Rafael allotment, including five sites where salamanders were found in the last two years. AGFD reported finding salamanders in 2002 near Lampshire Canyon (within the Papago allotment). Specimens were collected and sent to a lab for genetic testing; results are still pending. Visually, these collected metamorphs did not appear to be Sonora tiger salamanders which is why they were sent for genetic tests (T. Snow, pers. comm. 2003).

Suitable habitat (stock tanks) for the species exist on the Kunde and Papago allotments. Should Sonora tiger salamanders be confirmed on allotments within the action area, you agree to request initiation of formal consultation and implement stock pond management and maintenance guidelines within the affected allotments in potential habitats, unless the allotments in which salamanders are found are not grazed or otherwise affected by the proposed action.

## CONCLUSION

After reviewing the current status of the Sonora tiger salamander, the environmental baseline for the action area, and the effects of the proposed action, we concur with your determination that the proposed may affect, but is not likely to adversely affect, the Sonora tiger salamander. We base this conclusion on the following:

Surveys and specimens are collected from these allotments, and to date (2003), Sonora tiger salamanders are not known from these allotments.

### **Mexican spotted owl (*Strix occidentalis lucida*)**

We listed the Mexican spotted owl (MSO) as threatened, without critical habitat, in a Federal Register notice (58 FR 14248) dated March 16, 1993 (U.S. Fish and Wildlife Service 1993).

We designated MSO critical habitat in a Federal Register notice (60 FR 29913) dated June 6, 1995 (U.S. Fish and Wildlife Service 1995b). MSO critical habitat was revoked in a Federal Register notice (63 FR 14378) dated March 25, 1998 (U.S. Fish and Wildlife Service 1998b). We proposed to designate MSO critical habitat in a Federal Register notice (65 FR 45336) dated July 21, 2000 (U.S. Fish and Wildlife Service 2000b). We designated MSO critical habitat in a Federal Register notice (66 FR 8530) dated February 1, 2001 (U.S. Fish and Wildlife Service 2001). No critical habitat was designated in the action area or on the CNF. We are now under court order to re-propose MSO critical habitat. We will make a final designation by April 13, 2004.

MSO Protected Activity Centers (PACs) do not occur on the allotments. The PACs nearest to the Kunde and Papago allotments lie about two miles and four miles southwest of the southernmost allotment boundaries, respectively.

About 66 acres of existing, spottily distributed, non-contiguous riparian vegetation in Redrock and Lampshire canyons does not provide direct connectivity between these canyons (in the action area) and the nearest PACs. Riparian vegetation is generally considered restricted MSO habitat per the 1995 MSO recovery plan (U.S. Fish and Wildlife Service 1995a), but the riparian vegetation in these canyons is scattered and does not meet restricted habitat criteria per the plan. It is still possible that MSO could use these canyons for foraging or migration. Winter use by livestock on these allotments is proposed; however, livestock grazing effects are not anticipated to affect (open) the spotty canopy cover. Livestock grazing confined to one month in the winter will allow grasses and forbs that are MSO prey species habitat to regrow during the rest of the year(s), during growing seasons.

## CONCLUSION

After reviewing the current status of the MSO, the environmental baseline for the action area, and the effects of the proposed action, we concur with your determination that the proposed may affect, but is not likely to adversely affect, the MSO. We base this conclusion on the following:

1. MSO prefer specific habitat for nesting and roosting; the action area does not support such habitat.
2. The proposed action does not preclude MSO from foraging in the allotment canyons.
3. PACs are not located in the action area; the nearest two are two and four miles away.
4. No MSO critical habitat occurs in the action area.

**Huachuca water umbel (*Lilaeopsis schaffneriana* spp. *recurva*) and Canelo Hills ladies' tresses (*Spiranthes delitescens*)**

We listed the Huachuca water umbel (*Lilaeopsis schaffneriana* spp. *recurva*) and Canelo Hills ladies' tresses (*Spiranthes delitescens*) as endangered, without critical habitat, in a Federal Register notice (62 FR 665) on January 6, 1997 (U.S. Fish and Wildlife Service 1997a). These two wetland species occur on the Papago allotment in two known places; at Freeman Spring (fenced enclosure) and in O'Donnell Creek (fenced enclosure ) at the southernmost (upstream) part of the enclosure where water persists in deep pools year round.

Although the two plants occur in the O'Donnell Creek enclosure, the proposed livestock crossing is upstream of the plant localities and would not be affected by the twice-a-year crossings. You propose to regularly inspect and maintain the enclosure which should minimize or eliminate any potential effects to the species from trespass cattle.

**CONCLUSION**

After reviewing the current status of the Huachuca water umbel and Canelo Hills ladies' tresses, the environmental baseline for the action area, and the effects of the proposed action, we concur with your determination that the proposed may affect, but is not likely to adversely affect, the Huachuca water umbel or Canelo Hills ladies' tresses. We base this conclusion on the following:

1. You agree to inspect the O'Donnell Creek enclosure at least three times a year and maintain its functionality.
2. The enclosure protects these plant species from livestock grazing effects, in part due to the source population locations (upstream of the livestock crossing site).
3. Effects from livestock crossings are not anticipated to affect these two plant populations or their habitat because the source populations occur upstream of the crossing site and livestock will not be allowed to access those sites.