

**United States Department of the Interior  
U.S. Fish and Wildlife Service  
2321 West Royal Palm Road, Suite 103  
Phoenix, Arizona 85021  
Telephone: (602) 242-0210 FAX: (602) 242-2513**

AESO/SE  
02-21-03-F-0021

November 19, 2002

Mr. Ken Anderson  
District Ranger  
Red Rock Ranger District  
Coconino National Forest  
Post Office Box 300  
Sedona, Arizona 86339-0300

Dear Mr. Anderson:

Thank you for your request for consultation with the U.S. Fish and Wildlife Service pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended. Your request for formal consultation dated November 1, 2002, was received by us on November 4, 2002. At issue are impacts that may result from the Forest Service's proposed renovation of four livestock tanks on the Fossil Creek Allotment, Coconino National Forest, Coconino County, Arizona. The species of concern in this consultation is the threatened Chiricahua leopard frog (*Rana chiricahuensis*). Critical habitat was not designated for the Chiricahua leopard frog.

This biological opinion is based on information provided in the November 1, 2002, biological assessment and evaluation (BAE); correspondence and meetings with your staff and the Arizona Game and Fish Department (AGFD); telephone conversations; field investigations; and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the Chiricahua leopard frog, livestock tank renovation and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office. We have assigned log number 02-21-03-F-0021 to this project. Please refer to this number in future correspondence on this consultation.

## Consultation History

Details of the consultation history are summarized in Table 1.

Table 1. Summary of Consultation History

| <i>Date</i>      | <i>Event</i>  |
|------------------|---|
| October 29, 2002 | The Fish and Wildlife Service, the Forest Service, and the AGFD participated in a teleconference to discuss and plan the proposed action. |
| November 1, 2002 | The Forest Service initiated formal consultation on the proposed action.  |

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

This project entails the renovation of four stock tanks in the Buckskin Hills Conservation Management Zone, within the Fossil Creek Allotment on the Coconino National Forest. The goal is to increase the ability of these stock tanks to hold water in drought years. This is an important first step toward reaching the long-term goal of stabilizing extant populations and establishing new populations of Chiricahua leopard frogs in natural and self-sustaining aquatic systems within the Buckskin Hills Conservation Management Zone. The renovations are proposed with the goal that these tanks will be suitable habitat for Chiricahua leopard frogs during dry and drought years and serve as core habitats for the Chiricahua leopard frog in four different drainages within the area.

The four tanks to be renovated are: Walt's, Needed, Doren's Defeat, and Partnership. The tanks are located in Township 12 North, Range 7 East, Sections 5, 6, and 8. Walt's, Doren's Defeat, and Partnership tanks have all had frogs within the last two years and could serve as core habitat for frogs if these tanks held water in dry years. Needed Tank only holds water in wet years and needs to be renovated to function as habitat. Each tank should be cleaned of silt and deepened to the extent possible where the seal of the tank is not ruptured. Each tank will then be sealed with bentonite to prevent or slow the loss of water into the soil beneath these tanks. Tanks will be thoroughly surveyed for frogs prior to renovation.

Tank renovations will be accomplished through an AGFD contract and an AGFD biologist will oversee the tank renovations. Work is anticipated to start in mid to late November and tank cleaning will take approximately two weeks. Renovations will consist of using a front-end loader to push sediment in the basin of the tanks up onto the berms. Bentonite will then be added

to the tank in order to improve the tank's ability to hold water. The following conservation measures will be implemented in order to reduce the short-term adverse effects of tank renovation to the Chiricahua leopard frog:

- Cleaning, maintenance, or dredging of occupied tanks will occur only when tanks are dry (or near dry) and have been extensively surveyed for frogs. Any frogs observed during surveys will be captured and either relocated within the Buckskin Hills Conservation Management Zone or released back into the tank once tank cleaning is completed.
- Hiding cover and egg deposition sites will be added to the tank after cleaning in order to maintain or increase the amount of cover that was present prior to tank cleaning. Enhancement of hiding cover and egg deposition sites will take the form of placing logs, branches, or dead trees and shrubs into the tanks.
- Surface disturbance from tank cleaning activities will be minimized around tanks. Any heavy equipment used to clean the tanks or transport smaller equipment to the tanks will stay on existing roads to the tank and once in the tank will stay off the berms as much as possible. Upland vegetation around the tanks will not be disturbed by heavy equipment.
- Anyone who is authorized to work at stock tanks shall take all practicable precautions to minimize disease transmission and translocation of aquatic organisms. All equipment (front-end loader, waders, shovels, fence posts, etc.) used at the tank within the allotments shall be cleaned of all dirt and debris, rinsed in a ten percent bleach solution, allowed to thoroughly dry, and should not come into contact with another tank before or during use at Walt's, Partnership, Doren's Defeat, or Needed tanks.
- All precautions shall be taken (such as fish screens of 1/8 inch or smaller mesh and adding bleach or use of a municipal water source) to ensure that fish, bullfrogs and their tadpoles, and crayfish are not moved among tanks should water need to be added to the tank for proper bentonite application.

## **STATUS OF THE SPECIES**

The Chiricahua leopard frog was listed as a threatened species without critical habitat, effective July 13, 2002 (USDI 2002). The frog is distinguished from other members of the *Rana pipiens* complex by a combination of characters, including a distinctive pattern on the rear of the thigh consisting of small, raised, cream-colored spots or tubercles on a dark background; dorsolateral folds that are interrupted and deflected medially; stocky body proportions; relatively rough skin on the back and sides; and often green coloration on the head and back (Platz and Mecham 1979). The species also has a distinctive call consisting of a relatively long snore of 1 to 2 seconds in duration (Davidson 1996, Platz and Mecham 1979). Snout-vent lengths of adults

range from approximately 2.1 to 5.4 inches (Stebbins 1985, Platz and Mecham 1979). The Ramsey Canyon leopard frog (*Rana subaquavocalis*) is similar in appearance to the Chiricahua leopard frog, but it often grows to a larger size and has a distinct call that is typically given under water (Platz 1993).

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

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

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

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

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

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

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

Dispersal of leopard frogs away from water in the arid Southwest may occur less commonly than in mesic environments in Alberta, Michigan, or the Yucatan Peninsula during the wet season. However, there is evidence of substantial movements even in Arizona. In August, 1996, Rosen and Schwalbe (1998) found up to 25 young adult and subadult Chiricahua leopard frogs at a roadside puddle in the San Bernardino Valley, Arizona. They believed that the only possible origin of these frogs was a stock tank located approximately 3.4 miles away. Rosen *et al.* (1996) found small numbers of Chiricahua leopard frogs at two locations in Arizona that supported large populations of non-native predators. The authors suggested these frogs could not have originated at these locations because successful reproduction would have been precluded by predation. They found that the likely source of these animals were populations 1.2 to 4.3 miles distant. In the Dragoon Mountains, Arizona, Chiricahua leopard frogs breed at Halfmoon Tank, but frogs occasionally turn up at Cochise Spring (0.8 mile down canyon in an ephemeral drainage from Halfmoon Tank) and in Stronghold Canyon (1.1 miles down canyon from Halfmoon Tank). There is no breeding habitat for Chiricahua leopard frogs at Cochise Spring or Stronghold Canyon, thus it appears observations of frogs at these sites represent immigrants from Halfmoon Tank. In the Chiricahua Mountains, a population of Chiricahua leopard frogs disappeared from Silver Creek stock tank after the tank dried up; but frogs then began to appear in Cave Creek, which is about 0.6 mile away, again, suggesting immigration. Movements away from water do not appear to be random. Streams are important dispersal corridors for young northern leopard frogs (Seburn *et al.* 1997). Displaced northern leopard frogs will home, and apparently use olfactory and auditory cues, and possibly celestial orientation, as guides (Dole 1968, 1972). Rainfall or humidity may be an important factor in dispersal because odors carry well in moist air, making it easier for frogs to find other wetland sites (Sinsch 1991).

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.

The role of the chytridiomycete skin fungi in the population dynamics of the Chiricahua leopard frog is as yet undefined; however, it may well prove to be an important contributing factor in observed population decline. In Arizona, chytrid infections have been reported from four populations of Chiricahua leopard frogs (M. Sredl, pers. comm. 2000). The disease was recently reported from a metapopulation of Chiricahua leopard frogs from New Mexico; that metapopulation may have been extirpated (C. Painter, pers. comm. 2000). Rapid death of recently metamorphosed frogs in stock tank populations of Chiricahua leopard frogs in New

Mexico was attributed to post-metamorphic death syndrome (Declining Amphibian Populations Task Force 1993). Hale and May (1983) and Hale and Jarchow (1988) believed toxic airborne emissions from copper smelters killed Tarahumara frogs and Chiricahua leopard frogs in Arizona and Sonora. However in both cases, symptoms of moribund frogs matched those of chytridiomycosis. Chytrids were recently found in a specimen of Tarahumara frog collected during a die off in 1974 in Arizona. This earliest record for chytridiomycosis corresponds to the first observed mass die-offs of ranid frogs in Arizona.

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

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

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

## **ENVIRONMENTAL BASELINE**

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

### A. Status of the species within the action area

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

The only extant populations of Chiricahua leopard frogs on the Coconino National Forest occur within the project area. Ten occupied sites are currently known in about six square sections covering approximately 4,000 acres (Table 2). Three other sites contained frogs in 1993, but surveys have not located frogs since that time. These tanks occur within the Horseshoe Reservoir and Fossil Creek 5<sup>th</sup> code watersheds, within the Verde Basin. Records exist from other locations along the Mogollon Rim, including the East Clear Creek and West Clear Creek drainages, but these sites have been unoccupied since at least the mid-1980s.

Table 2. Tanks where Chiricahua leopard frogs have been observed since 1993 within the Buckskin Hills Conservation Management Zone. Tank names followed by an asterisk (\*) indicate that the tank dried in 2002.

| <i>Site</i>           | <i>Date Chiricahua leopard frogs last observed</i> |
|-----------------------|--|
| Buck Tank*            | 09/18/2001   |
| Buckskin Tank*        | 10/06/2002   |
| Contractor Tank*      | 09/21/1993   |
| Doren's Defeat Tank*  | 09/18/2001   |
| Little Buckskin Tank* | 06/22/2001   |
| Middle Tank           | 09/17/2001   |
| Mud Tank No. 2        | 09/21/1993   |
| Partnership Tank*     | 10/28/2002   |
| Peak Tank             | 07/29/2002   |
| Pine Tank             | 05/24/2000   |
| Sycamore Basin Tank   | 10/28/2002   |
| Tanque Aloma          | 09/21/1993   |
| Walt's Tank*          | 09/05/2002   |



Of the four tanks proposed for renovation Needed and Doren's Defeat tanks have been dry all year. These two tanks were most recently visited by AGFD on October 28, 2002. Despite recent precipitation, neither tank held water and no frogs were observed. Therefore, Needed and Doren's Defeat tanks currently do not provide suitable habitat for Chiricahua leopard frogs. Chiricahua leopard frogs have never been observed at Needed tank, but were located at Doren's Defeat tank in 2000 and 2001.

Surveys have located frogs at Partnership tank every year since 1999. On October 28, 2002, AGFD observed one Chiricahua leopard frog at Partnership tank. The frog would likely perish at Partnership tank without adequate water for over-wintering (aestivating), so the Fish and Wildlife Service, the AGFD, and the Forest Service decided to capture the frog and relocate it to Sycamore Basin tank (approximately one mile to the NE of Partnership tank). Sycamore Basin tank held water all summer and is currently occupied by Chiricahua leopard frogs.

The last tank to be renovated is Walt's tank. Walt's tank does not currently hold enough water to support frogs. However, at least 18 Chiricahua leopard frogs were observed at the tank this summer and frogs have been located there every year since 1997. In August and early September of 2002, extensive efforts were taken to capture all observed Chiricahua leopard frogs at Walt's tank. A total of 17 frogs were captured and relocated to the Sonoran Desert Museum in Tucson, Arizona. Follow-up surveys at Walt's tank resulted in the observation of a single frog. However, AGFD biologists conducted four surveys since that time and have been unable to locate the frog. Since the tank is no longer holding water, it is assumed that any frogs that may have been missed in surveys died from predation or dessication.

## **B. Factors affecting species environment within the action area**

Actions within the project area that affect Chiricahua leopard frogs include ongoing livestock grazing and other related actions, wild ungulate (elk) grazing, recreation, roads, and the introductions of fish and other aquatic organisms. Recreation use is increasing rapidly within the area. Campers and off-road vehicles cause soil compaction, reduce riparian vegetation, and reduced infiltration. Non-native fish, frogs, and crayfish prey on eggs, tadpoles, and occasionally adult leopard frogs. Crayfish may also affect the habitat by impacting aquatic and riparian vegetation along streams, potentially destroying habitat for the Chiricahua leopard frog. Roads may adversely impact riparian habitat directly and indirectly (alteration of streamflow, timing of peak flows, increased sedimentation, etc.), and provide access to people which facilitates the introduction of non-native fish and crayfish.

## **EFFECTS OF THE ACTION**

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

Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

Although thorough surveys of the tanks will be conducted prior to renovation, it is extremely difficult to locate all frogs at a tank. Frogs present in the mud or in emergent vegetation could be killed or injured during silt removal or berm repair. If not killed, they may be flushed from moist retreats and die of exposure or dessication, or be killed by predators. If remaining wetted soils and emergent vegetation are completely disturbed or removed during cleaning out of a tank, a frog population could possibly be eliminated. There is very little vegetation left at any of the four tanks, however, there are many deep cracks in the mud. Since Needed and Doren's Defeat tank have been dry all year, it is very likely that no frogs are present, even in deep cracks. However, Chiricahua leopard frogs were observed at both Walt's and Partnership tanks this year. Therefore, the potential exists for frogs to be present at the time of tank renovation despite survey efforts prior to tank cleaning. Should surveys fail to detect frogs that are present, frogs may be crushed or mauled by heavy equipment. If frogs are located, capture, handling, and possibly translocation or frogs may also result in injury.

Indirect effects from tank renovation to Chiricahua leopard frogs include the destruction of aquatic habitat, the introduction of the chytrid fungus, and the introduction/relocation of non-native fish and crayfish to tanks. As stated above, there is little hiding cover (vegetation) at any of the four tanks due to the drought and lack of water. The proposed action calls for placing logs, branches, and/or dead trees and shrubs in tanks following renovation in order to increase the amount of cover present prior to tank cleaning. In addition, there is the possibility that renovation efforts may puncture the existing seal of the tank. However, an experienced contractor is conducting the work and because tanks in basalt soils are the most difficult to rupture, this concern is minimal. However, should the seal be ruptured, efforts will be taken to repair the tank bottom.

The use of equipment to clean tanks also increased the chance for introducing chytrid fungus. However, as stated in the proposed action, all equipment used will be cleaned of all mud and debris, thoroughly rinsed with a 10% chlorine solution, and/or allowed to completely dry prior to renovation work at Walt's, Partnership, Doren's Defeat, or Needed tanks. The equipment will not be used in any other areas prior to completing work at those four tanks. Chytrid fungus has been detected as close as New Tank (approximately eight miles to the northeast of the project area), no chytrid-positive species have been collected or die-offs observed within the project area.

The introduction of exotic fish and crayfish may occur if water is brought in from off-site. Since bentonite is more effective when mixed with water, water may be hauled in from an off-site source. However, the proposed action states that fish screens (1/8 inch or smaller mesh) will be used to avoid drafting exotic fish; and, the contractor will use bleach to kill exotic organisms or use a municipal water source to avoid the inadvertent introduction of exotic fish or crayfish.

In the long term, tank cleaning will be beneficial for the Chiricahua leopard frog. Renovation

will deepen the tanks and the addition of bentonite will improve the tanks' ability to hold water even during times of drought. The presence of more dependable water will improve the potential for Chiricahua leopard frogs to disperse up and down drainages. In addition, renovation will increase the tanks' potential to hold water year round which is a requirement for sustaining populations of Chiricahua leopard frogs.

## **CUMULATIVE EFFECTS**

Cumulative effects include those of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions are subject to the consultation requirements established under section 7, and therefore are not considered cumulative in the proposed action. Future actions within or next to the action area that are reasonably certain to occur include urban growth and development, an increase in non-native aquatic organisms, recreation, road construction, fuels-reduction treatments, elk grazing, and other associated actions. These actions have the potential to reduce the quality of habitat for the Chiricahua leopard frog and contribute as cumulative effects to the proposed action.

## **CONCLUSION**

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

After reviewing the current status of the Chiricahua leopard frog, the environmental baseline for the action area, the effects of the proposed livestock tank renovation and the cumulative effects, it is our biological opinion that the livestock tank renovation, as proposed, is not likely to jeopardize the continued existence of the Chiricahua leopard frog. No critical habitat has been designated for this species, therefore, none will be affected. We make this finding for the following reasons:

1. The proposed tank renovation includes only four tanks within the Buckskin Hills Conservation Management Zone and will not impact known occupied tanks currently holding water.
2. Implementation of the proposed conservation measures is expected to greatly reduce the risk of direct and indirect impacts to Chiricahua leopard frogs that may be present.
3. The proposed action has the potential to help restore earthen tank habitat within the Buckskin Hills Conservation Management Zone for Chiricahua leopard frogs.

## 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 in section 3 of the Act as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is defined at 50 CFR 17.3 to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined at 50 CFR 17.3 as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

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

### AMOUNT OR EXTENT OF TAKE

Despite conservation measures included in the proposed action, take of Chiricahua leopard frogs at Walt’s and Partnership tank could occur in the form of harm, harassment, injury, or death resulting from (1) mauling or crushing by heavy equipment during renovation, and (2) capture, holding, and/or translocation of any frogs located prior to tank renovation. Though multiple surveys have been conducted at both tanks, frogs have been removed from both tanks, and surveys will be conducted prior to tank renovation, we cannot be reasonably certain that no frogs are present in the mud or deep cracks of the tanks. We anticipate that incidental take of Chiricahua leopard frogs resulting from mauling or crushing by heavy equipment will be difficult to detect as sediment is moved. However, based on survey data, we anticipate that no more than ten frogs will be taken as a result of tank renovation activities at Walt’s and Partnership Tanks. This number is based on the number of frogs located and collected at each tank this past summer and the number of frogs that may be reasonably certain to presently occur at the two tanks.

## **EFFECT OF THE TAKE**

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

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

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

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

## **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, Federal Building, Room 8, 26 North McDonald, Mesa, Arizona (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.

## **CONSERVATION RECOMMENDATIONS**

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

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

2. We recommend that the Forest Service work with us and the AGFD to begin an aggressive program to control non-native aquatic organisms on the Forest, particularly bullfrogs, fish, and crayfish.
3. We recommend that the Forest Service work with us to develop a programmatic biological opinion to cover future tank renovation and maintenance on the Coconino National Forest.

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

### **REINITIATION NOTICE**

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

We appreciate your efforts to improve Chiricahua leopard frog habitat and identify and minimize effects to the species from this project. For further information please contact Shaula Hedwall (928) 226-1811 of our Flagstaff Suboffice or Tom Gatz at (602) 242-0210 (x240). Please refer to the consultation number, 2-21-03-F-0021, in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle  
Field Supervisor

cc: Regional Director, U.S. Fish and Wildlife Service, Albuquerque, NM (ARD-ES)  
Field Supervisor, New Mexico Ecological Service Field Office, U.S. Fish and Wildlife Service, Albuquerque, NM  
Forest Supervisor, Coconino National Forest, Flagstaff, AZ (Attn: Jim Golden)

Mr. Ken Anderson

15

Forest Biologist, Coconino National Forest, Flagstaff, AZ (Attn: Cecelia Overby)  
Wildlife Staff, Mogollon Rim Ranger District, Happy Jack, AZ (Attn: Cathy Taylor)  
Wildlife Staff, Red Rock Ranger District, Sedona, AZ (Attn: Janie Agyagos)  
John Kennedy, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

W:\Shaula Hedwall\Livestock Tank Renovation Fossil Creek Allotment.wpd:cgg

**LITERATURE CITED**

- Bowers, J.E., and S.P. McLaughlin. 1994. Flora of the Huachuca Mountains. Pages 135-143 in L.F. DeBano *et al.* (Tech. Coord.), Biodiversity and management of the Madrean Archipelago: the sky islands of the Southwestern United States and Northwestern Mexico. USDA Forest Service General Technical Report RM-GTR-264.
- Campbell, J.A. 1998. Amphibians and Reptiles of northern Guatemala, the Yucatan, and Belize. University of Oklahoma Press, Norman, Oklahoma.
- Clarkson, R.W., and J.C. Rorabaugh. 1989. Status of leopard frogs (*Rana pipiens* Complex) in Arizona and southeastern California. *Southwestern Naturalist* 34(4):531-538.
- Daszak, P. 2000. Frog decline and epidemic disease. International Society for Infectious Diseases. [Http://www.promedmail.org](http://www.promedmail.org).
- Davidson, C. 1996. Frog and toad calls of the Rocky Mountains. Library of Natural Sounds, Cornell Laboratory of Ornithology, Ithaca, NY.
- Declining Amphibian Populations Task Force. 1993. Post-metamorphic death syndrome. *Froglog* 7:1-2.
- Degenhardt, W.G., C.W. Painter, and A.H. Price. 1996. Amphibians and reptiles of New Mexico. University of New Mexico Press, Albuquerque.
- Dole, J.W. 1972. Evidence of celestial orientation in newly-metamorphosed *Rana pipiens*. *Herpetologica* 28:273-276.
- Dole, J.W. 1971. Dispersal of recently metamorphosed leopard frogs, *Rana pipiens*. *Copeia* 1971:221-228.
- Dole, J.W. 1968. Homing in leopard frogs, *Rana pipiens*. *Ecology* 49:386-399.
- Fernandez, P.J., and J.T. Bagnara. 1995. Recent changes in leopard frog distribution in the White Mountains of east central Arizona. Page 4 in abstracts of the First Annual Meeting of the Southwestern Working Group of the Declining Amphibian Populations Task Force, Phoenix, AZ.
- Fernandez, P.J. and P.C. Rosen. 1998. Effects of introduced crayfish on the Chiricahua leopard frog and its stream habitat in the White Mountains, Arizona. Page 5 in abstracts of the Fourth Annual Meeting of the Declining Amphibian Populations Task Force, Phoenix, AZ.
- Hale, S.F., and J.L. Jarchow. 1988. The status of the Tarahumara frog (*Rana tarahumarae*) in the United States and Mexico: part II. Report to the Arizona Game and Fish Department, Phoenix, Arizona, and the Office of Endangered Species, U.S. Fish and Wildlife Service, Albuquerque, New Mexico.



Hale, S.F., and C.J. May. 1983. Status report for *Rana tarahumarae* Boulenger. Arizona Natural Heritage Program, Tucson. Report to Office of Endangered Species, US Fish and Wildlife Service, Albuquerque, NM.

Halliday, T.R. 1998. A declining amphibian conundrum. *Nature* 394:418-419.

Jennings, R.D. 1995. Investigations of recently viable leopard frog populations in New Mexico: *Rana chiricahuensis* and *Rana yavapaiensis*. New Mexico Game and Fish Department, Santa Fe.

Jennings, R.D. 1987. The status of *Rana berlandieri*, the Rio Grande leopard frog, and *Rana yavapaiensis*, the lowland leopard frog, in New Mexico. Report to New Mexico Department of Game and Fish, Santa Fe, New Mexico.

Longcore, J.E. 2000. Information excerpted from Joyce Longcore. Biosafety chapter, workbook for Amphibian Health Examinations and Disease Monitoring Workshop, US Fish and Wildlife Service, National Conservation Training Center, Shepherdstown, WV, Feb 17-18, 2000.

Painter, C.W. 2000. Status of listed and category herpetofauna. Report to US Fish and Wildlife Service, Albuquerque, NM. Completion report for E-31/1-5.

Platz, J.E. 1993. *Rana subaquavocalis*, a remarkable new species of leopard frog (*Rana pipiens* Complex) from southeastern Arizona that calls under water. *Journal of Herpetology* 27(2):154-162.

Platz, J.E., and J.S. Mecham. 1984. *Rana chiricahuensis*. *Catalogue of American Amphibians and Reptiles* 347.1.

Platz, J.E., and J.S. Mecham. 1979. *Rana chiricahuensis*, a new species of leopard frog (*Rana pipiens* Complex) from Arizona. *Copeia* 1979(3):383-390.

Rorabaugh, J.C. In press. *Rana berlandieri* Baird, 1854, Rio Grande Leopard Frog. In Lanoo, M.J. (Ed.), *Status and Conservation of U.S. Amphibians*. Volume 2: Species Accounts. University of California Press, Berkeley, CA.

Rosen, P.C., and C.R. Schwalbe. 1998. Using managed waters for conservation of threatened frogs. Pages 180-202 in *Proceedings of Symposium on Environmental, Economic, and Legal Issues Related to Rangeland Water Developments*. November 13-15, 1997, Tempe, AZ.

Rosen, P.C., C.R. Schwalbe, D.A. Parizek, P.A. Holm, and C.H. Lowe. 1994. Introduced aquatic vertebrates in the Chiricahua region: effects on declining native ranid frogs. Pages

- 251-261 in L.F. DeBano, G.J. Gottfried, R.H. Hamre, C.B. Edminster, P.F. Ffolliott, and A. Ortega-Rubio (tech. coords.), Biodiversity and management of the Madrean Archipelago. USDA Forest Service, General Technical Report RM-GTR-264.
- Rosen, P.C., C.R. Schwalbe, and S.S. Sartorius. 1996. Decline of the Chiricahua leopard frog in Arizona mediated by introduced species. Report to Heritage program, Arizona Game and Fish Department, Phoenix, AZ. IIPAM Project No. I92052.
- Seburn, C.N.L., D.C. Seburn, and C.A. Paszkowski. 1997. Northern leopard frog (*Rana pipiens*) dispersal in relation to habitat. *Herpetological Conservation* 1:64-72.
- Sinsch, U. 1991. Mini-review: the orientation behaviour of amphibians. *Herpetological Journal* 1:541-544.
- Snyder, J., T. Maret, and J.P. Collins. 1996. Exotic species and the distribution of native amphibians in the San Rafael Valley, AZ. Page 6 in abstracts of the Second Annual Meeting of the Southwestern United States Working Group of the Declining Amphibian Populations Task Force, Tucson, AZ.
- Sredl, M.J., and J.M. Howland. 1994. Conservation and management of madrean populations of the Chiricahua leopard frog, *Rana chiricahuensis*. Arizona Game and Fish Department, Nongame Branch, Phoenix, AZ.
- Sredl, M.J., J.M. Howland, J.E. Wallace, and L.S. Saylor. 1997. Status and distribution of Arizona's native ranid frogs. Pages 45-101 in M.J. Sredl (ed). Ranid frog conservation and management. Arizona Game and Fish Department, Nongame and Endangered Wildlife Program, Technical Report 121.
- Sredl, M.J., and L.S. Saylor. 1998. Conservation and management zones and the role of earthen cattle tanks in conserving Arizona leopard frogs on large landscapes. Pages 211-225 in *Proceedings of Symposium on Environmental, Economic, and Legal Issues Related to Rangeland Water Developments*. November 13-15, 1997, Tempe, AZ.
- Stebbins, R.C. 1985. *A Field Guide to Western Reptiles and Amphibians*. Houghton Mifflin Company, Boston, MA.
- U.S. Department of the Interior (USDI), Fish and Wildlife Service. 2002. Endangered and threatened wildlife and plants; listing of the Chiricahua leopard frog (*Rana chiricahuensis*). *Federal Register* 67(114):40790-40811. June 13, 2002.