United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

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Memorandum

To: Assistant Regional Director, Migratory Birds and State Programs, U.S. Fish and Wildlife Service, Albuquerque, New Mexico (Attn: Federal Aid)

From: State Supervisor, New Mexico Ecological Services Field Office, U.S. Fish and Wildlife Service, Albuquerque, New Mexico

Subject: Intraservice Section 7 Consultation on Proposed Chiricahua Leopard Frog Translocations by Turner Endangered Species Fund on the Ladder Ranch, New Mexico (Consultation# 02-22-03-F-0526)

This document transmits the U.S. Fish and Wildlife Service biological opinion on the effects of actions associated with Chiricahua leopard frog translocations and the Rio Grande sucker habitat use study on the Ladder Ranch, as requested by Federal Aid. This biological opinion analyzes the effects of the proposed action on the Chiricahua leopard frog (*Rana chiricahuensis*) (frog) on the Ladder Ranch, owned by Turner Enterprises. Turner Endangered Species Fund will be translocating frogs on the Ladder Ranch. They will also be electroshocking Rio Grande sucker to assess their habitat use and movement. This activity is also likely to impact frogs.

BIOLOGICAL OPINION

Consultation History

This biological opinion analyzes the effects to the frog that would result from the implementation of two proposals submitted by Turner Endangered Species Fund in January 2003. Discussions regarding these projects have taken place between the New Mexico Ecological Services Field Office (NMESFO), Turner Endangered Species Fund, the Section 7 Coordinator for Region 2 of the U.S. Fish and Wildlife Service, and the Permit Office and Federal Aid Office for Region 2 of the U.S. Fish and Wildlife Service.

BIOLOGICAL OPINION

I. Description of the Proposed Action

Frogs are known to occupy all four drainages on the Ladder Ranch: Seco, Palomas, Animas, and Cuchillo Negro.

Turner Endangered Species Fund has offered to assist in the conservation of the frog by expanding the current range of the species within the Ladder Ranch and potentially becoming a donor source for future reestablishment efforts offsite. The size of the source population, appropriate life stage for translocation, timing of translocations, and the impacts after translocations were considered in the proposed action.

Turner Endangered Species Fund proposes to expand the range of the frog on the Ladder Ranch by translocating individuals from healthy populations to currently unoccupied, but suitable habitat. The goals of this project are to establish new populations of frogs, increase the number of individuals, and provide a buffer for existing populations against disease outbreak, drought, or other threats. In addition, the information obtained from this project will be used in future translocations throughout the range of the frog.

Before translocations occur, a minimum of five adult frogs will be tested for the chytrids fungus using the Polymerase Chain Reaction test to insure that disease will not be spread. Frogs will be removed from only North Seco Well and Pauge Well in the Seco Creek drainage and frogs will be translocated within Seco Creek drainage to excellent or suitable habitat as defined in "Investigations of the Status and Distribution of Amphibians on the Ladder Ranch with Special Emphasis on the Chiricahua Leopard Frog (*Rana chiricahuensis*)" submitted to Turner Enterprises by Bruce L. Christman on January 20, 2002. Up to 6 adult frogs may be removed from North Seco and/or Pauge Wells as long as 60 adult frogs are present at each site. In addition, up to 10 percent of subadults and 20 percent of tadpoles from each of these areas may be removed for translocations as long as at least 60 subadults and 120 tadpoles are present, respectively.

Transportation of the frogs will occur at night if feasible to minimize impacts. Toe clipping of translocated frogs will be done to assess site fidelity post-translocation. Additionally, radio transmitters will be placed on adult frogs to monitor movement post-translocation. As anticipated in the research proposal, up to 50 percent of the adults, subadults, and tadpoles may die incidental to the translocation efforts. In early 2004, a meeting will be held to discuss the results of the project between Turner Endangered Species Fund and NMESFO.

In addition to the frog translocation project, Turner Endangered Species Fund will be conducting a study on the habitat use and movement of Rio Grande suckers on the Ladder Ranch. This project will provide more information regarding the distribution, habitat use, and movement patterns of Rio Grande suckers. The data gathered will provide guidance for the development of a Rio Grande sucker management plan on the Ladder Ranch.

Electroshocking will be used to survey Rio Grande suckers. Since these areas may be occupied by frog, before electroshocking will commence, one of the following two conditions will be met:

a. Frog surveys immediately prior (24 hours) to electroshocking activities along the entire streambank of the area to be electroshocked will be completed. The areas where

frogs, tadpoles, or egg masses are detected, or the observer hears a frog jump into the water, will be flagged. A buffer area of 10 meters will be placed around these frogs, tadpoles, and egg masses where electroshocking will not occur;

b. If an area will be electro shocked where frogs or tadpoles occur, they will be removed using dipnets and seines and placed in 5-gallon buckets, 1 adult frog or 10 tadpoles per bucket. Frogs and tadpoles will be kept for up to 24 hours while electroshocking occurs. After electroshocking ceases, frogs and tadpoles will be placed back into the water as close to the area where they were initially found as possible. Water temperatures between the buckets and water bodies should only be a few degrees different before releasing frogs and tadpoles. No electroshocking will occur around egg masses.

II. Status of the Species

The frog was federally listed on June 13, 2002, as a threatened species without critical habitat (U.S. Fish and Wildlife Service 2002). Leopard frogs (*Rana pipiens* complex), long considered to consist of a few highly variable species, are now recognized as a diverse assemblage of more than 2 dozen species (Hillis 1988), with many species described in the last 20 years. Platz and Platz (1973) demonstrated that at least three distinct forms of leopard frogs occurred in Arizona, including the southern form, which was subsequently described as the Chiricahua leopard frog (Platz and Mecham 1979).

This new species was 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 were 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 54 to 139 millimeters (2.1 to 5.4 inches) (Platz and Mecham 1979).

The frog is an inhabitant of cienegas (wetlands), pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 to 8,890 ft (1,000 to 2,710 m) in central and southeastern Arizona; west-central and southwestern New Mexico; and in Mexico in the northern Sonora and the Sierra Madre Occidental of Chihuahua (Sredl et al. 1997; Degenhardt et al. 1996; Platz and Mecham 1979). In New Mexico, of sites occupied by the frogs from 1994 to 1999, 67 percent were creeks or rivers, 17 percent were springs or spring runs, and 12 percent were stock tanks (Painter 2000). Based on Painter (2000), the species is still extant in all major drainages in New Mexico where it occurred historically; however, recent surveys suggest the species may have recently disappeared from some major drainages in New Mexico (C. Painter, New Mexico Department of Game and Fish, pers. comm. 2003).

The frog occurs in southwestern New Mexico and is most common in the Gila and San Francisco River drainages (Degenhardt et al. 1996). Jennings (1995) stated that the Gila Wilderness in the

Gila National Forest has the greatest potential for supporting additional extant populations and for securing an intact metapopulation that would have a good chance of long-term persistence.

In New Mexico, the frog may exhibit seasonal fluctuations in relative abundance. Overall abundance increases with the metamorphosis of tadpoles in August and September, and is lowest from December through March (Degenhardt et al. 1996). Throughout the year, frog activity generally increases as the nocturnal water temperature increases (Jennings 1990).

Populations of the frog occurring in thermally stable habitats (e.g., hot springs) may be reproductively active throughout the year. Jennings (1988, 1990) reported reproductive activity throughout the year in Alamosa Warm Springs in Socorro County, New Mexico, where the water temperature remained above 61°F (16°C). He also found that in a nearby stock tank with varying water temperatures, reproduction occurred only during late April through May, and again from mid-August through late September.

Degenhardt et al. (1996) reported that frogs are shy, nocturnal and typically seek shelter when approached. During the day they usually rest hidden among the vegetation surrounding their aquatic habitat and will enter the water with little stimulation. Degenhardt et al. (1996) reported that this species is the most aquatic of the leopard frogs within New Mexico.

The food habits of the frog have not been studied in New Mexico, although like other leopard frogs it is likely that it eats a wide variety of insects and other arthropods (Degenhardt et al. 1996). Sredl and Jennings (in press) indicate that the tadpoles are herbivorous and likely feed on diatoms, phytoplankton, filamentous green algae, water milfoil, and duckweed.

Threats to this species include predation by nonnative organisms, disease, drought, floods, degradation and destruction of habitat, water diversions and groundwater pumping, disruption of metapopulation dynamics, increased possibility of extirpation due to low numbers, and environmental contamination (U.S. Fish and Wildlife Service 2002). Numerous studies indicate that declines and extirpations of the 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 (*Oronectes spp.*), and several other fish species (Fernandez and Rosen 1996; Rosen et al. 1994, 1996; Snyder et al. 1996; Fernandez and Bagnara 1995; Sredl and Howland 1994; Clarkson and Rorabaugh 1989). For example, in the Chiricahua region of southeastern Arizona, Rosen et al. (1996) found that almost all perennial waters investigated that lacked introduced vertebrate predators contained frogs. In perennial waters with introduced predators, particularly fishes and bullfrogs, frogs were generally absent (Sredl and Howland 1994).

Disruption of metapopulation dynamics is an important factor in the regional loss of populations (Sredl and Howland 1994; Sredl et al. 1997). Frog populations are often small, with dynamic habitats (appearing and disappearing), 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 by immigration from nearby populations. However, as the numbers of populations declined and became more isolated, it is less likely the areas previously occupied would be recolonized. In addition, most of the larger source populations along the major rivers have disappeared. The species has been extirpated from about 75 percent of its historic localities in Arizona and New Mexico (Degenhardt et al. 1996).

Recent evidence suggests that a chytridiomycete skin fungi is partly responsible for observed declines of frogs, toads, and salamanders in Panama, Costa Rica, Brazil, Ecuador, Uruguay, Australia, New Zealand, Spain, Germany, South Africa, Kenya, Mexico, and the United States (Speare and Berger 2000; Longcore et al. 1999; Berger et al. 1998). Ninety-four species of amphibians have been reported as infected with the chytrid fungus (*Batrachochytrium dendrobatidis*) (Speare and Berger 2000). In Arizona, chytrid infections have been reported from the frog, Rio Grande leopard frog (*Rana berlandieri*), plains leopard frog (*Rana blairi*), lowland leopard frog (*Rana yavapaiensis*), Tarahumara frog (*Rana tarahumarae*), canyon treefrog (*Hyla arenicolor*), and Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*) (Morell 1999; Sredl and Caldwell 2000).

Berger et al. (1998) reported that chytridiomycosis and other amphibian diseases can be spread by transporting mud, water, or frogs from one site to another. In addition, disease can be spread by muddy or wet boots, nets, vehicles, or other equipment. The chytrid fungus is not known to have an airborne spore, but disperses among individuals and populations by zoospores that swim through water or during contact between individual frogs (Daszak 2000). If chytridiomycosis is a recent introduction on a global scale, then dispersal by global or regional commerce, translocation of frogs and other organisms, and travel among areas by anglers, scientists, tourists, animals, and others are viable scenarios for transmission of this disease (Halliday 1998; Daszak 2000).

The disease, Postmetamorphic Death Syndrome (PDS), was implicated in the extirpation of frog populations in Grant County, New Mexico, as well as in other frog and toad species (Declining Amphibian Populations Task Force 1993). All stock tank populations of the frog in the vicinity of Gillette and Cooney tanks in Grant County disappeared within a 3-year period, apparently as a result of PDS (Declining Amphibian Populations Task Force 1993). The syndrome is characterized by death of all or a majority of recently metamorphosed frogs in a short period of time. The syndrome appears to spread among adjacent populations, causing regional loss of populations or metapopulations.

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

As a result of the translocation, it is assumed that some frogs may perish during capture, transport, attachment of radio transmitters, or unfamiliarity with the habitat into which they are introduced. Injury may occur from capture of frogs and from transport due to changes in water quality or stress to the animals. The attachment of radio transmitters may result in injury such as skin irritation to the frogs or potentially mortality from an increased risk in detection by predators. Additionally, toe clipping may reduce escape time from predators or may inhibit capturing prey, possibly resulting in behavioral changes or death.

As reported in the project proposal submitted by Turner Endangered Species Fund, up to 50 percent of frogs may die as a result of the translocation, for a total of up to 6 adult frogs, 5 percent of subadults, and 10 percent tadpoles. To minimize these effects, frogs will be translocated at night, if feasible, and will remain moist in transport. Although toe clipping will be permitted, only one toe clip per adult frog is authorized and will be conducted in accordance with "Toe-Clipping of Frogs and Toads" by the Amphibian Research and Monitoring Initiative, National Wildlife Health Center.

Electroshocking activities will affect frogs. In general, electroshocking will impact organisms by causing rigidity and muscle spasms which may result in injury or death. Rigidity from electroshocking can lead to internal injuries and may increase susceptibility to predation. From the information available, electroshocking for Rio Grande suckers in areas assumed to be occupied by the frog may lead to injury or death of frogs.

IV. Conclusion

After reviewing the current status of the frog, the environmental baseline for the action area, the anticipated effects of the proposed action, and cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the frog. No critical habitat has been designated, thus none would be affected. We make these findings for the following reasons:

1. The frog occurs over a large area of southeastern Arizona and southwestern New Mexico. The proposed action affects a very small percentage of the species' range.

2. Translocations of frogs are likely to adversely affect the frog in the short term; however, there should be beneficial, long-term effects.

3. Electroshocking for Rio Grande suckers will likely adversely affect the frog; however, the impacts of electroshocking on the overall population of frogs is expected to be minimal.

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 without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such

conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Harass is defined in the same regulation by the Service 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 that include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take of a listed animal species that is incidental to, and not the purpose of, the carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, 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 Turner Endangered Species Fund, so that they become binding conditions of any grant or permit issued to the applicants, as appropriate, in order for the exemption in section 7(o)(2) to apply. Turner Endangered Species Fund has a continuing duty to regulate the activity covered by this incidental take statement. If the Turner Endangered Species Fund, (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

1. Amount and Extent of Take Anticipated

As a result of the translocation, it is assumed that some frogs may perish during capture, transport, attachment of radio transmitters, or most likely, as a result of unfamiliarity with the habitat into which they are introduced. No intentional mortalities of frogs will occur. Electroshocking activities may result in the injury or death of a frog. We anticipate incidental take could occur in the following manner:

1. Up to 50 percent of frogs may die as a result of the translocation, for a total of up to 6 adult frogs, 5 percent of subadults, and 10 percent tadpoles.

2. One frog may be injured or killed as a result of electroshocking for Rio Grande suckers.

II. Effect of the Take

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

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize impacts of incidental take of the frog.

1. Turner Endangered Species Fund shall take measures to minimize the impact to frogs, tadpoles, and egg masses in the action area during frog translocations and electroshocking activities.

Terms and Conditions

1.1 To prevent the possible spread of frog diseases during this process, Turner Endangered Species Fund shall disinfect any equipment, boots, nets, and buckets with a 10 chlorine bleach solution or 1 percent quaternary ammonia (Quat 128), following all label instructions.

1.2 Frogs will be translocated at night, if feasible, and will remain moist in transport. When transporting adult frogs, a maximum of 5 adult frogs will be placed in a 5-gallon bucket. Up to 10 tadpoles can be placed in a 5-gallon bucket. Lids with holes are to be placed on the buckets while moving frogs and tadpoles between sites. Once the frogs and tadpoles are brought to a translocation site, water temperature at the new site and in the buckets will be tested to ensure that there is not more than a few degrees difference.

1.3 Frogs with transmitters are to be checked every 3 weeks for injury. If injury occurs to a radio-transmittered frog, the radio transmitter is to be removed and not replaced on the frog for the remainder of the study.

1.4 Turner Endangered Species Fund is authorized to do one toe clipping per translocated frog for the purpose of mark-recapture, genetics testing, and chytrid analysis as outlined in Standard Operating Procedure for "Toe-clipping of Frogs and Toads" by the Amphibian Research and Monitoring Initiative, National Wildlife Health Center.

1.5 Turner Endangered Species Fund is authorized to injure or kill up to one adult frog or tadpole during electroshocking activities. If this occurs, NMESFO will be contacted within 24 hours. If a frog or tadpole dies, it will be preserved in 10 percent formalin and accessioned to the University of New Mexico, Museum of Southwestern Biology. If a frog or tadpole is injured, it is to be collected and housed in a 5-gallon bucket until the situation can be discussed with the NMESFO. The injured frog or tadpole will not be released. If a frog or tadpole is injured or killed, all electroshocking will cease until NMESFO can assess the effects.

1.9 Electroshocking for Rio Grande suckers will only be done with a battery-powered backpack electroshocker. A maximum time limit to electroshock of 500 seconds per 100 meters (330 feet) is placed on areas where frogs are assumed to occupy. All electroshocking will be done in a downstream to upstream pattern.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed

action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Turner Endangered Species Fund must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

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. The term "conservation recommendations" has been defined as Service suggestions regarding discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility. In order for the Service to be kept informed of activities that either minimize or avoid adverse effects or that benefit listed species or their habitats, the Service requests notification of the implementation of the conservation recommendations below. The Service recommends the enhancement of frog habitats on the Ladder Ranch, where applicable.

REINITIATION NOTICE

This concludes formal consultation on the Turner Endangered Species Fund activities which may impact the frog on the Ladder Ranch, Sierra County, New Mexico. 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 maintained (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; or (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate your continued coordination and support for endangered species and their habitats. In future communications regarding this biological opinion, please refer to consultation# 2-22-03-F-0526. If you have any comments or questions, please contact Eileen Everett at 505/761-4720, or at the letterhead address.

Joy E. Nicholopoulos

Joy E. Nicholopoulos

cc:
Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico

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