



United States Department of the Interior

U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 FAX: (602) 242-2513



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Memorandum

To: Regional Director, Fish and Wildlife Service, Albuquerque, New Mexico
(ARD-ES)(Attn: Luella Roberts)

From: Field Supervisor, Arizona Ecological Services Field Office, Phoenix, Arizona

Subject: Intra-Service Biological Opinion Regarding the Proposed Issuance of an
Incidental Take Permit (TE- 073684-0) and Approval of a Safe Harbor
Agreement for Chiricahua Leopard Frog for the Malpai Borderland Group

This memorandum represents our Biological Opinion (BO), furnished under Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act) on the issuance of a permit authorizing the incidental take of the Threatened Chiricahua leopard frog (*Rana chiricahuensis*) under the authority of Section 10(a)(1)(A) of the Act to the Malpai Borderland Group (Malpai). Along with the permit application, Malpai submitted a draft Safe Harbor Agreement (Agreement) for conservation of Chiricahua leopard frogs that was available for public review for 30 days (68 FR 57702). The Agreement would cover non-Federal lands located within the Malpai planning area within Cochise County, Arizona and Hidalgo County, New Mexico (See Figure 1).

This biological opinion analyzes the potential effects that issuance of this permit may have on the threatened Chiricahua leopard frog. We determined that this action will have no effect on threatened bald eagle (*Haliaeetus leucocephalus*), candidate black-tailed prairie dog (*Cynomys ludovicianus*), threatened Cochise pincushion cactus (*Corypantha robbinsorum*), endangered Mexican gray wolf (*Canis lupus*), endangered Jaguar (*Panthera onca*), endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*), endangered Mexican long-nosed bat (*Leptonycteris nivalis*), threatened Mexican spotted owl (*Strix occidentalis lucida*), threatened New Mexican ridge-nosed rattlesnake (*Crotalus willardi obscurus*), endangered northern aplomado falcon (*Falco femoralis septentrionalis*), endangered Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*), endangered southwestern willow flycatcher (*Empidonax traillii extimus*), proposed threatened Gila chub (*Gila intermedia*), and the candidate western yellow-billed cuckoo (*Coccyzus americanus*).

This biological opinion is based on information provided in the December 26, 2003 draft Safe Harbor Agreement, telephone conversations, field investigations, Fish and Wildlife Service (FWS) files, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, the activities covered

in the Agreement, and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file in the Arizona Ecological Services Field Office.

Consultation History

- The Malpai drafted the Agreement in 2000 prior to the listing of Chiricahua leopard frog as a threatened species.
- The Agreement and the application for Section 10(a)(1)(A) enhancement of survival permit were submitted on July 31, 2002.
- Language in the Agreement was updated to agree with the listing of the Chiricahua leopard frog as Threatened (67 FR 40790).
- The availability of the draft Agreement and permit application for 30-day public review period was published in the Federal Register on October 6, 2003 (68 FR 57702).

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is our issuance of a section 10(a)(1)(A) permit to Malpai for the incidental take of the threatened Chiricahua leopard frog. The incidental take would include possible loss of individuals and habitat modification on non-Federal lands within the Malpai Borderland Region of New Mexico and Arizona, owned or managed by members of Malpai and adjacent non-Federal landowners, associated with a safe harbor agreement. A complete description of the proposed action and associated conservation measures is included in the Agreement (Lehmann 2003).

Malpai is requesting a permit to allow landowners to participate, through certificates of inclusion, in conservation activities ranging from improvement of habitats to introduction of Chiricahua leopard frogs onto their property. These conservation activities will aid in the recovery of the species on private lands while providing regulatory assurances for landowners and their neighbors.

Beginning in spring of 2004, various habitats on willing landowners properties will be sampled and evaluated by qualified personnel to establish a baseline. Participants will choose from a list of conservation activities ranging from preservation of existing habitat to introduction of frogs. A complete description of activities is in Section 2.5.5 of the Agreement. In addition, all Participating Landowners and Neighbors will practice minimum conservation measures as described in Section 2.5.4, at enrolled sites. Enrollment into the Agreement, through a certificate of Inclusion, will be for a minimum of 10 years, with the assurances to Participating Landowners for two additional years and one additional year for Participating Neighbors, beyond the minimum 10-year conservation period. The duration of the Section 10(a)(1)(A) permit is 50 years, with no assurances beyond the expiration of the permit.

Minimization measures were developed to avoid excessive mortality or extirpation of leopard frogs during regular operations and maintenance of stock tanks and other ranch related activities.

Measures are more fully described within the Agreement, but include: constructing a refugia site; implementing tank maintenance regimes, schedules, or techniques that maintain a portion of the tank as escape cover; allowing all equipment used for tank maintenance to dry thoroughly or sterilizing equipment before moving to another site to prevent disease transmission; allowing appropriate agencies to collect and hold leopard frogs during maintenance activities; conducting maintenance during the most active period of leopard frogs (April 1 to October 31); translocating frogs into an alternative tank only if it meets short-term habitat goals; managing livestock grazing in and around stock tanks supporting leopard frogs to avoid destruction or excessive deterioration of leopard frog habitat; preventing or controlling the introduction of non-native aquatic predators into leopard frog habitat; and for land treatments that alter vegetation or change run off characteristics including measures such as buffers around drainages, erosion control structures, and buffers around the enrolled sites.

A series of conservation enhancement measures are anticipated to occur throughout the enrolled properties. Each Participating Landowner will select one or more enhancements that will provide a conservation benefit for existing or new populations of leopard frogs on their property. These include: the establishment of new leopard frog populations, construction of a double tank system, construction of small refugia sites, fencing portions of habitat, deepening the tank, drilling new wells, constructing distribution pipelines, removal of aquatic predators from otherwise suitable sites, maintenance of existing habitats, enhancement of travel corridors, enhancement of stream and cienega habitats, and enhancement of vegetation in or around aquatic sites.

The permit and Agreement include monitoring, in accordance with FWS policy (64 FR 32717-32726) and Federal regulation: 1) compliance monitoring (to ensure that all commitments in the Agreement are being met); and 2) biological monitoring (to ensure that the biological goals of the Agreement are being met and to determine the effectiveness of its conservation program). Malpai will submit an annual report by February 15 of each year throughout the term of the permit documenting the cumulative total participants enrolled, number of leopard frog sites being managed in each metapopulation, the status of each metapopulation in terms of the Agreement's biological goals and reestablishment criteria, copies of the certificates of inclusion, funding sources that were used, any incidental take of leopard frogs, results of biological monitoring, notes of meetings and activities of the Malpai Conservation Committee, and any other pertinent information regarding the permit.

STATUS OF THE SPECIES

Chiricahua leopard frog (*Rana chiricahuensis*)

The Chiricahua leopard frog (*Rana chiricahuensis*) was listed as a threatened species without critical habitat on June 13, 2002 (67 FR 40790). Included was a special rule to exempt operation and maintenance of livestock tanks on non-Federal lands from the section 9 take prohibitions of the Act. 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 Meham 1979).

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 northern Sonora, the Sierra Madre Occidental of Chihuahua, and northern Durango, Mexico (Platz and Meham 1984, Jennings and Scott 1993, Degenhardt *et al.* 1996, Sredl *et al.* 1997, Sredl and Jennings *in press*). 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 all known historical 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 populations extant in Arizona from 1993-1996 were found in stock tanks (Sredl and Saylor 1998). Blomquist (2003) suggests that some aquatic sites are "activity centers" at which breeding, foraging, and overwintering occur. Upland and other aquatic sites serve as dispersal and possibly foraging and temporary breeding habitat, while habitat barriers are typically disturbed sites that decrease the likelihood of successful dispersal or may be population sinks.

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. Moreover, the species is now 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 (C. Painter, pers. comm. 2000).

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, a history of fire suppression and grazing that has increased the likelihood of crown fires, mining, development, and environmental contamination; disruption of metapopulation dynamics; and increased chance of extirpation or extinction resulting from small numbers of populations. 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 with 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 (Rosen *et al.* 2001, 1996, 1994; Fernandez and Rosen 1998, 1996; 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 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 at cienega complexes have disappeared.

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) (Speare and Berger 2000, Longcore *et al.* 1999, Berger *et al.* 1998, Hale 2001). Ninety-four species of amphibians have been diagnosed as infected with the chytrid, *Batrachochytrium dendrobatidis*. Chytrid infections have been reported from four populations of Chiricahua leopard frogs (M. Sredl, pers. comm. 2000), as well as populations of Rio Grande leopard frog (*Rana berlandieri*), Plains leopard frog (*Rana blairi*), lowland leopard frog (*Rana yavapaiensis*), Tarahumara frog (*Rana tarahumarae*), bullfrog, canyon treefrog (*Hyla arenicolor*), and Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*) (Bradley *et al.* 2002, Hale 2001, Davidson *et al.* 2000, Sredl and Caldwell 2000, Morell 1999). In New Mexico, chytridiomycosis was identified in a declining population near Hurley, and recent patterns of decline at 3 other populations are consistent with chytridiomycosis (R. Jennings, pers. comm. 2000). Die-offs occur during the cooler months from October-February. High temperatures during the summer may slow reproduction of chytrids to a point at which the organism can not cause disease (Bradley *et al.* 2002).

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). 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. The disease has now been documented to have been associated with Tarahumara frog die-offs since 1974 (Hale 2001). The earliest record for chytridiomycosis in Arizona (Tarahumara frog -1974) corresponds to the first observed mass die-offs of ranid frogs in Arizona.

Additional information about the Chiricahua leopard frog can be found in Painter (2000), Sredl *et al.* (1997), Degenhardt *et al.* (1996), Jennings (1995), Rosen *et al.* (1996, 1994), Sredl and Howland (1994), Jennings and Scott (1993), Platz and Mecham (1984, 1979), and Sredl and Jennings (*in press*).

Environmental Baseline

The Chiricahua leopard frog is likely limited to 42 or fewer localities in the southern portion of its range (FWS files). Approximately 12 known, reproducing leopard frog populations occur within the Agreement's covered area. These include population sites on Forest Service lands (Coronado National Forest), on State lands utilized by a Malpai landowner under a State grazing allotment, and (the majority) on private ranch lands within the Malpai covered area (Rosen 1999). Of these 12 sites, one occurs in natural spring or stream habitat, one within an artificially constructed fenced enclosure on the San Bernardino National Wildlife Refuge (Refuge), and at least nine occur in stock tanks. In addition, a number of stock tanks on Malpai lands are known to support leopard frog populations in years with relatively high rainfall (Rosen, pers. comm.), and other currently unoccupied tanks have the potential to support additional leopard frog populations (Rosen 1999). These data indicate the actual and potential importance of ranch lands, and particularly stock tanks, to leopard frogs in the Malpai area.

A number of aquatic sites within the Malpai covered area are also known to support significant populations of bullfrogs and other non-native species; including Black Draw on the Refuge, the leopard frog enclosure on the Refuge – which has been invaded by bullfrogs despite a “frog-proof” fence (Bill Radke, Refuge Manager, pers. comm.), the cienega at Gray Ranch headquarters, and possibly other locations. These data indicate the potentially precarious nature of Chiricahua leopard frog populations in the Malpai area with respect to bullfrog competition, and the challenge of managing for one frog species and against another in the same vicinity.

Nevertheless, management of Chiricahua leopard frog populations within the Malpai covered area represents a potentially important component in conservation of this species (Rosen 1999). Furthermore, a number of Malpai landowners have expressed a willingness to accept the presence of Chiricahua leopard frogs on their lands, provided their economic interests can be reasonably protected. Indeed, in one well-publicized case, the Magoffin Ranch maintained a small leopard frog population in one of its stock tanks by hauling 1,000 gallons of water per week to the tank for approximately 24 months during a drought from June 1994 until summer of 1996. It was this population from which leopard frog tadpoles were provided to establish the populations now present in the Refuge enclosure. They were also used in the Douglas High School captive propagation facility, which is not currently in operation.

EFFECTS OF THE ACTION

The effects of the action include: removing Chiricahua leopard frogs from existing population sites, transporting frogs, possible introduction of disease, normal stock tank operation and maintenance, modification of habitat to enhance habitat, and the reduction of established sites back to baseline.

Direct and Indirect Effects

Direct effects of this Agreement include the capture of frogs from existing populations to move them to new unoccupied sites. During the translocation process some frogs may unintentionally be killed or injured. In addition, the source population will lose individuals. Loss of these frogs is anticipated to be a short-term effect, based upon the reproductive potential of Ranid frogs. The loss of individuals will be replaced by the next breeding season. Furthermore, individuals will be translocated at the egg mass, tadpole, or metamorph stages. This will reduce the impacts to existing breeding populations as most individuals in these stages normally do not add to the adult population due to naturally high mortality rates. The measures identified within the Agreement will help to minimize stress, injury, and death associated with capture and transport. In spite of these measures, it is possible that a few individuals will be lost.

Individuals translocated will be released primarily within the same metapopulation identified within the Agreement. While the source location may be directly impacted by the loss of individuals, the new population sites within the metapopulation will provide additional localities from which frogs may immigrate to extirpated sites within the metapopulation. It is anticipated that a reduction in competition between remaining individuals in a population would result in increased reproduction and survival rates. A similar effect is expected in the new population site where frogs are released. An overall increase in the number of population sites within a metapopulation should improve the stability of the metapopulation.

Chiricahua leopard frogs may be subject to a number of diseases, including chytridiomycosis. Chytridiomycosis is transmissible through zoospores that swim through water or through direct contact between frogs. The disease can likely be spread via bullfrogs, salamanders, or possibly other organisms moving among aquatic sites; by muddy or wet boots, vehicles, or other equipment during frog management activities; as a result of livestock grazing activities; and through flood events and natural migration of frogs. The translocation of frogs from one population site to another, monitoring, and stock tank maintenance could result in the spread of disease from one population to another. Within one year of the effective date of this Agreement, a Disease Prevention Protocol will be drafted that specifies the measures necessary to prevent transmission of chytridiomycosis and other communicable frog diseases to and among leopard frog populations within the covered area. Such measures would include, at a minimum, screening any frogs reestablished or translocated within the covered area, with PCR tests periodic monitoring of populations for chytridiomycosis with PCR testing, appropriate equipment handling procedures (e.g. letting equipment dry, or disinfecting equipment, prior to moving to another aquatic site), and identifying of any technical expertise that will be needed in disease screening and other activities under the Protocol, and possible sources of such expertise.

In some cases, it may be appropriate to salvage frogs and dry out stock tanks to eliminate chytridiomycosis. Frogs can be treated and cleared of the disease with itraconazole (Nichols and Lamirande 2003) and returned to the tank once it refills.

The primary activities under this Agreement that will affect Chiricahua leopard frogs are the normal operation and maintenance of stock tanks. These activities include the use of tanks by livestock, and the occasional dredging of tanks, which may include the complete draining and drying of the aquatic habitat. These activities may result in the loss of egg masses and tadpoles due to trampling by livestock and the loss of individuals of all age classes due to the temporary loss of habitat and crushing through the use of construction equipment. These activities are currently exempt from the Section 9 prohibition of take under the Section 4(d) rule published as part of the final listing for Chiricahua leopard frog (67 FR 40790). Discussion of these activities in this take statement is included to address any possibility of a future reclassification of the frog to endangered or in the event the 4(d) rule is vacated by court order, without disruption of the conservation benefit of the Agreement or its assurances. The amount of take from these sources will be minimized through the minimum conservation measures identified in the Agreement for all participants. It is further anticipated that individuals lost due to operation and maintenance activities will be replaced during the next breeding season as discussed above.

The Agreement requires the establishment of a species' baseline on all enrolled sites, except three sites on McGoffin Ranch that are addressed specifically in the Agreement. Baselines in the Agreement will be based upon the presence or absence of frogs, not the number of individuals in a site, and habitat. The conservation actions in the Agreement will result in establishment of populations, protection of existing habitat, and enhancement of habitat above the baseline. At the end of the 10-year minimum conservation period, the participant may take the enrolled sites back to the established baseline documented in the certificate of inclusion. This in effect could result in the loss of all population sites established as part of the Agreement, but not part of the original baseline. The Agreement provides for the salvage of frogs from all sites returning to baseline, so while individuals will be lost due to the loss of habitat, not all gains from the conservation activities will be lost with the return to baseline. It is anticipated that many enrolled sites will be renewed indefinitely throughout the 50-year duration of the permit and the permit is likely to be renewed as well. However, potentially all sites that are enhanced or have frogs established through the Agreement may be lost as the landowners assurances are exercised. Frogs from sites that will returned to baseline can be salvaged and translocated to new sites within the metapopulation on other private or Federal lands, if possible and appropriate.

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. The lands within the action area are primarily Federal and non-Federal rangeland. During the 50 years of this permit, it is not likely that the land-use patterns within the action area are likely to change significantly.

Grazing and grazing related activities on non-Federal lands are not likely to change significantly during the duration of the section 10(a)(1)(A) permit. Activities related to grazing livestock and range management would include the presence of livestock on the range, use of aquatic sites as water holes, use of forage in upland sites surrounding aquatic sites, maintenance of stock tanks, and land treatments (herbicide treatment and prescribed fire). Livestock grazing results in variable removal of ground cover. During periods of drought and in areas where grazing management is slow in reacting to deteriorating range conditions, increased erosion may result in increased sedimentation into stock tanks and other aquatic habitats. This could result in an increase in the frequency of maintenance activities in stock tanks and impact on dispersal corridors between aquatic sites. Land treatments to maintain or restore rangeland include the use of herbicides and prescribed fire to reduce shrubs and increase perennial grasses. Many of these land treatments would be consulted on through cooperative efforts with National Resource Conservation Service or the U.S. Forest Service; however, small treatments could occur without the assistance of a Federal agency or money. Aquatic sites are not likely to be impacted directly, but may be inadvertently affected by run off of sediment, ash, or herbicide. The addition of sediment and ash could bury egg masses and suffocate tadpoles. Some herbicides have been shown to cause developmental defects in frogs (Davidson et al. 2002 and Hayes et al. 2002). While these effects are substantial, the area covered by land treatments, without a Federal nexus, is likely to be small and infrequent. In addition, any Participating Landowner or Neighbor in the Agreement would be required to notify and allow salvage of frogs prior to any land treatment. This further limits the impact of these activities within the action area.

The transportation system through the action area includes a combination of improved state highways, minor arterials and unimproved rural roads. All these roads will require periodic maintenance during the duration of the permit. It is also reasonable to assume that Arizona State Route 80 is likely to be improved and possibly widened in the next 50 years. These activities could potentially increase traffic speeds, allow for increased traffic, and potentially impact sites near improved roads. It could further increase visitation to occupied sites, resulting in impacts from illegal collection and illegal stocking of exotic predators. Increases in traffic volume and speed would result in greater fragmentation of habitat, as the rate of road kill would increase for individuals dispersing across the roadways.

Currently no development of private lands is occurring within the action area. However, just northwest of State Route 80 and north of Rodeo, Arizona, a development of 40-acre ranchettes is currently being built and sold. Impacts of this development will likely include increased traffic on roads, more recreational visitation to state and Federal lands within the action area, increased use of ground water, and increased occupancy of this development and future subdivisions that will likely be developed in the area.

CONCLUSION

After reviewing the current status of Chiricahua leopard frog, the environmental baseline for the action area, the effects of the proposed issuance of the Section 10(a)(1)(A) permit and associated Agreement, and the cumulative effects, it is our biological opinion that the issuance of the permit, 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. In making our determination we considered the following:

- The status of Chiricahua leopard frog has been documented to be in decline over the past 15 years. This has been accelerated in some parts of the range due to continued drought. In addition, exotic aquatic predators have displaced leopard frogs through much of its range. Chytrid fungus infections continue to exist and have resulted in the loss of many populations.
- The current distribution within the action area includes populations on Federal and Non-Federal lands. Many of these populations have been affected by the presence of bullfrogs and other exotic predators. Chytridiomycosis is present in some population sites within the covered area and appropriate precautions to avoid spread through conservation activities are part of the required minimization measures and handling protocols. This past year has seen some very stable sites threatened by continued drought in the region. Several landowners have been providing assistance to maintain these populations.
- The cumulative effects in the action area are not anticipated to increase significantly over the life of the project. Most of the foreseeable effects are related to the continued use of rangeland for cattle grazing operations. While cattle grazing may have some impact on this species, the operation and maintenance of stock tanks as part of livestock management has been determined to be beneficial beyond the impacts of grazing. Land treatments on private land are likely to be small due to the expense associated with the use of prescribed fire and herbicide application. Impacts from these activities are expected to be small and localized. The improvements and maintenance of roads within the action area are likely to occur and could result in increased road mortality of dispersing frogs with increased traffic volumes and speeds.

In summary, our conclusions are based on the record of this consultation including the Agreement, correspondence and meetings with Malpai, the information outlined in this BO, and the following:

1. Existing population site would only be impacted initially by removal of subadults frogs (eggs, tadpoles, and metamorphs) for translocation into new population sites or to repopulate extirpated sites. In subsequent years, frogs for translocations would be moved from population sites that are not part of the baseline.
2. Rapid frogs have a high reproductive rate that reduces the effects of removing individuals from existing populations. Effects of the removal would be short-term and, due to decreased competition, may result in increased survival and reproduction in remaining frogs.
3. Translocation of subadults would have less impact than adult frogs on existing populations due to the higher mortality rate of subadult life stages.

4. Participants in this Agreement will implement minimization measures to reduce the impacts of ongoing activities within the action area.
5. Spread of disease will be minimized by using best practices for handling, monitoring, and translocation of frogs, as well as the required minimization measures in the Agreement. In addition, a formalized Disease Prevention Protocol will be drafted within the first year of the implementation of the Agreement.
6. The conservation benefits of the Agreement will increase the number of population sites, which should result in increased stability of the two metapopulations within the action area. Stable metapopulations will be less susceptible to stochastic events (drought).
7. The duration of the permit is long enough to provide long-term conservation benefits to this species, both in habitat availability and in the ability of this species to reproduce and disperse.
8. All activities that could result in take of frogs at participating sites will be preceded with adequate notification and access to provide a chance to salvage frogs for return to the site or translocation to another site as appropriate.
9. An annual report will be submitted that documents the number of aquatic sites covered by the agreement, status of each metapopulation under the agreement, new Participants that have signed Certificates of inclusion in the last year, any leopard frog management activities, funding sources that were used, any incidental take, biological monitoring activities, and any other pertinent information regarding the status of the Agreement.

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 Agreement for Malpai Borderlands Group clearly identifies the management activities that will be implemented to provide a net conservation benefit and contribution to recovery of

Chiricahua leopard frogs covered by the Section 10(a)(1)(A) permit. The anticipated impacts to Chiricahua leopard frogs likely to result from the proposed actions and the return to baseline conditions by participants under the Agreement have been identified in the Agreement. All management activities described in the Agreement and any Section 10(a)(1)(A) permit are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within the incidental take statement pursuant to 50 CFR §402.14(i). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(A) and section 7(o)(2) of the Act to apply. If the cooperators and the participants fail to adhere to these terms and conditions, the protective coverage of the Section 10(a)(1)(A) permit and Section 7(o)(2) may lapse. However, the FWS and Malpai may agree that modifications to the management activities are needed. The process for modifications in management activities to be incorporated is described within the Agreement. These new modifications will be incorporated as reasonable and prudent measures, superceding the former management activities.

AMOUNT OR EXTENT OF TAKE

We have developed the following incidental take statement based on the premise that the Agreement would be implemented in its entirety. We anticipate potentially all populations of Chiricahua leopard frogs above established baseline for enrolled properties under the Malpai Borderlands Groups Safe Harbor Agreement for Chiricahua leopard frogs could be taken as a result of this proposed action.

The Agreement and its associated section 10(a)(1)(A) permit will authorize take of leopard frogs as a result of the following specific landowner activities: 1) "routine" stock tank repair and maintenance or "emergency" stock tank repair and maintenance; 2) construction of any stock tank improvement projects or facilities needed for frog management purposes and specifically described in the landowner's Certificate of Inclusion, including fences, pipelines, or road segments immediately associated with such projects; 3) capture, translocation, and/or temporary holding of leopard frogs during tank maintenance and improvement activities, if necessary to minimize mortality or injury to frogs, or to implement the Agreement's conservation program; 4) livestock grazing and use either in the immediate vicinity of any stock tanks that support leopard frogs (e.g., resulting in destruction of egg masses or tadpoles) or at other ranch locations (e.g., resulting in take of migrating frogs); 5) livestock grazing and use where such use results in take of leopard frogs as a result of inadvertent disease transmission, provided that the landowner has undertaken necessary measures to minimize such take as described in the Agreement; 6) take associated with the retirement or removal of a stock tank, if such eventuality is needed for ranch management purposes; 7) any normal day-to-day ranch management activity, such as operation of cars and trucks, if such activities result in occasional and inadvertent takings of frogs moving across roads or other ranch properties; and 8) returning of an enrolled property to baseline condition. These take authorizations are contingent on adequate implementation of all commitments required by this Agreement. The Agreement and associated permit, if approved, does not authorize take of leopard frogs that might occur as a result of prescribed burns, construction of roads or other ranch facilities not associated with specific leopard frog conservation projects or actions, and activities resulting in a change to a leopard frog population site from a customary ranching use to a non-ranching use (e.g., development of the site for non-ranching commercial purposes), except as provided for Participating Neighbors (section 2.6.5).

The Agreement does not authorize take below the established baseline for any activity, except for those activities associated with translocation, salvage and holding, and habitat enhancement, which are expected to have short-term effects. Additional, incidental take authority below established baseline for a property would need to be obtained through another ESA permitting process such as a Habitat Conservation Plan under section 10(a)(1)(B) of the ESA.

Under the current listing of the Chiricahua leopard frog as a threatened species, activities listed in numbers 1 and 4 above are covered on non-Federal lands by the 4(d) rule included in the final decision to list this species (65 FR 37343). Take as defined in section 9 as a result of these activities is authorized under the 4(d) rule, unless the Chiricahua leopard frog were reclassified to endangered or the 4(d) rule is invalidated. The discussion of take is in light of the possibility of a reclassification to Endangered or a court-ordered invalidation of the 4(d) rule, and thus take as a result of these activities is part of the assurances of this Agreement and incidental take statement. Typical ways in which leopard frogs might be taken during these activities is described in the Agreement; as are the measures that will be undertaken under this Agreement to minimize take of leopard frogs during these activities. Except with respect to number 8 above, these measures are designed specifically to ensure that leopard frog populations inhabiting affected stock tanks and other sites continue to survive. This Agreement and the associated section 10(a)(1)(A) permit do not authorize deliberate direct take of Chiricahua leopard frogs, (e.g. capture not directly related to implementation of the Agreement, collection, or hunting).

The actual levels of incidental take of leopard frogs that will occur under the Agreement are difficult to quantify. Due to the explosive reproductive potential of this species, it is difficult to know specific leopard frog population levels at any given time, both throughout the covered area and within individual sites enrolled in the Agreement. Therefore, take should be discussed in terms of population sites. In addition, the number of landowners and the degree to which they elect to participate in the Agreement over the 50-year term of the Agreement and associated section 10(a)(1)(A) permit is not known. In particular, it is unclear how many Participating Landowners and Neighbors will elect to return lands enrolled under the Agreement to their baseline conditions over the life of the Agreement. The Malpai and FWS believe, in most cases, that Participating Landowners and Neighbors will not elect to return enrolled lands to baseline conditions, since stock tanks and other aquatic sites are essential features to livestock ranching, which is the primary land-use activity occurring in the covered area, and because the conservation measures are designed to be compatible with livestock ranching. Typically, a Participating Landowner would be expected to return enrolled aquatic sites to baseline conditions only in the event that such sites were needed for another ranching purpose (e.g., a stock tank needs to be moved to another location, or a tank site is needed for another ranching use). In any case, the conservation benefits to Chiricahua leopard frogs anticipated as a result of the Agreement are expected to more than balance the relatively minimal levels of take anticipated as a result of the activities described above. Therefore, the level of take anticipated is:

- An unquantifiable number of eggs, tadpoles, and metamorphs captured, transported, and released to establish new population sites or to augment existing or extirpated sites.

- An unquantifiable number of individuals at all life stages captured, held, and released as part of conservation measures to minimize mortality during stock tank maintenance and implementation of conservation actions as part of the Agreement.
- All frogs, above established baseline, at enrolled sites that are returned to baseline.

This is the total level of take anticipated for the proposed actions as described in the Description of Proposed Actions section of this opinion. Absent written agreement to the contrary or wavier, the Participating Landowners and Neighbors shall notify the FWS at least 60 days in advance of when they expect to carry out an activity that is likely to result in the taking of a listed covered species to provide the FWS with an opportunity to rescue affected individuals of such species, if possible and appropriate. Such notification shall be provided to:

Field Supervisor
 U. S. Fish and Wildlife Services
 Arizona Ecological Services Field Office
 2321 W. Royal Palm Road, Suite 103
 Phoenix, Arizona 85021-4951
 Phone: 602/242-0210

EFFECT OF THE TAKE

In this biological opinion, the FWS determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES and TERMS AND CONDITIONS

We believe the following reasonable and prudent measures are necessary and appropriate to minimize or avoid impacts of incidental take to the Chiricahua leopard frog.

1. We shall require that the applicant comply with and implement the issued section 10(a)(1)(A) incidental take permit and Safe Harbor Agreement.
2. Any population site that is part of a Participating Landowner's or Neighbor's baseline shall be reestablished, if appropriate, should it be extirpated during the period that a landowner is enrolled in the Agreement.

There are no additional reasonable and prudent measures required if this project is implemented as proposed.

The reasonable and prudent measures are designed to minimize or avoid the impact of 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. Malpai 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.

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 W. Broadway Rd. #113, Mesa, Arizona 85202 (480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted as soon as possible to this office or the nearest Arizona Game and Fish Department office, educational, or research institutions (e.g., University of Arizona in Tucson) holding appropriate State and Federal permits.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, our office should be contacted regarding the final disposition of the animal.

CONSERVATION RECOMMENDATIONS

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

1. Invite us to participate with Malpai to implement adaptive management procedures to regularly assess and improve attainment of the goals of the Agreement.

In order for us to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we will document the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation on the proposed issuance of a Section 10(a)(1)(A) permit to allow incidental take of Chiricahua leopard frog for management activities outlined in the Agreement on enrolled non-federal property within the Malpai Borderlands Area. 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; (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

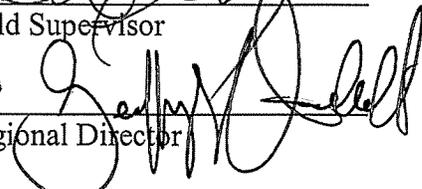
species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have questions regarding this Biological Opinion or the Safe Harbor Agreement, please contact Marty Tuegel at (520) 670-6150 (x 232) or Sherry Barrett at (520) 670-6150 (x 223). Please refer to the consultation number, 2-21-03-F-0496, in future correspondence concerning this project.



Field Supervisor

4/2/04
Date

ACTIVO


Regional Director

4/20/04
Date

- cc: Bob Broscheid, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
- Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ (Attn: Joan Scott)
- Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
- (Attn: Sarah Rinkevich)
- Malpai Borderlands Group

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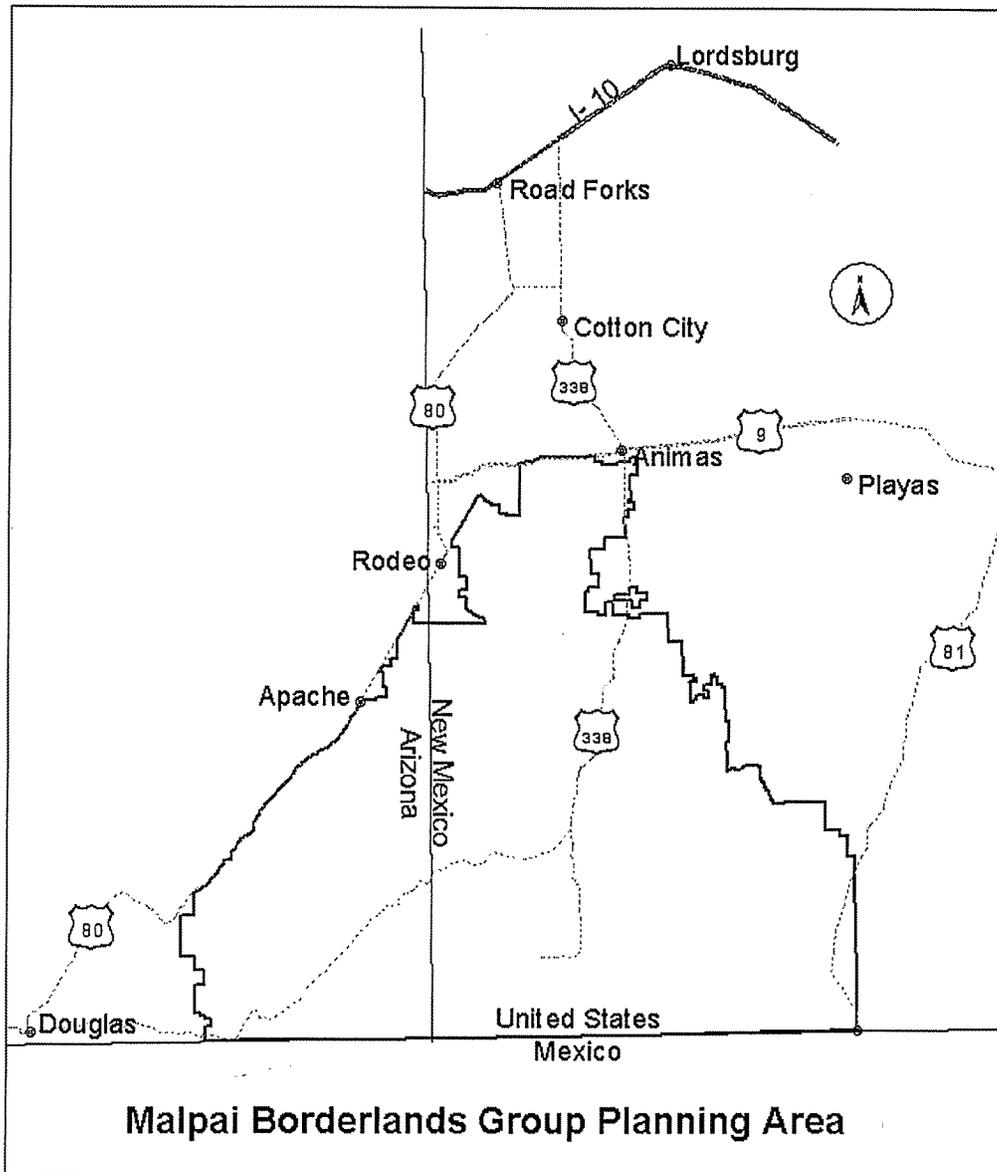
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TABLES AND FIGURES

Figure 1. Action Area



Appendix A: No Affect

Bald Eagle	<i>Haliaeetus leucocephalus</i>
black-tailed prairie dog	<i>Cynomys ludovicianus</i>
Cochise pincushion cactus	<i>Corypantha robbinsorum</i>
gray wolf	<i>Canis lupus</i>
Jaguar	<i>Panthera onca</i>
lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuenae</i>
Mexican long-nosed bat	<i>Leptonycteris nivalis</i>
Mexican spotted owl	<i>Strix occidentalis lucida</i>
New Mexican ridge-nosed rattlesnake	<i>Crotalus willardi obscurus</i>
northern aplomado falcon	<i>Falco femoralis septentrionalis</i>
Sonora tiger salamander	<i>Ambystoma tigrinum stebbinsi</i>
southwest willow flycatcher	<i>Empidonax trailli extimus</i>