

**Chiricahua Leopard Frog Recovery Update
Recovery Units 5-7 (Arizona)
For the Mogollon Rim Stakeholders Group Meeting
Payson, Arizona
10 February 2010**

Number of localities where frogs were observed in 08 or in recent years and were likely still present in RU 1-4 as of October 2008: ~15

Number of localities where frogs were observed in 09 or in recent years and are likely still present in RU 5 as of December 2009: 13

Number of localities where frogs were observed in 09 or in recent years and are likely still present in RU 6 (AZ portion) as of December 2009: 2 (includes SHA pop just outside RU6)

Number of localities where frogs were observed in 09 or in recent years and are likely still present in RU 7 (AZ portion) as of December 2009: ~4

Total in RUs 5-7 (AZ) as of December 2009: ~19

Modest increases are due to stable conditions in existing populations and reestablishment projects in RU 5 in 2009.

Recovery Plan – The Recovery plan is available at:

<http://www.fws.gov/southwest/es/arizona/CLF.htm>.

Information on the Recovery Program is available at:

http://www.fws.gov/southwest/es/arizona/CLF_Recovery_Home.html

The Chiricahua leopard frog listserve - To subscribe to the list go to:

<https://www.fws.gov/lists/listinfo/chiricahuensis>. Postings can be made by sending an email to: chiricahuensis@lists.fws.gov.

The document “Chiricahua Leopard Frog Criteria for Making Effects Determinations” (useful for section 7 consultations and NEPA compliance) was completed in 2009 and is available on the Recovery Program Website.

The Chiricahua leopard frog was designated a Spotlight Species for Region 2 of the Fish and Wildlife Service, which may facilitate the funding of recovery actions with USFWS funds. A Spotlight Species Action Plan will be available on the Recovery Website.

Change in ESA Status for Ramsey Canyon leopard frogs: The Fish and Wildlife Service published a petition finding on 475 Southwestern species on 16 December 2009. The “Ramsey Canyon leopard frog” was one of the species petitioned. In the finding, the FWS found that the Ramsey Canyon leopard frog has been sunk into the taxon *Lithobates chiricahuensis*, and that all former populations of Ramsey Canyon leopard frog are now listed as threatened under the Endangered Species Act.

The West Central New Mexico Steering Committee met in Silver City on 12 January 2010. Meeting notes from that meeting will be posted on the Recovery Website.

The Invasive Species Information Page was updated and a Chiricahua Leopard Frog Information Brochure was completed. Both were distributed on the listserve.

General Recovery Activities Needed in the Mogollon Rim Region of AZ in 09

In general we need help to: 1) monitor extant populations, 2) survey for additional extant populations, 3) survey for habitat; identify and assess potential reestablishment sites, 4) identify and implement habitat improvements in each management area (MA); 5) identify and establish

refugium populations; and 6) enroll interested/willing partners into the AGFD Statewide Safe Harbor Agreement (SHA).

These actions need to occur in all Recovery Units to help meet the recovery criteria (e.g. “at least two metapopulations in different drainages plus at least one isolated and robust population in each RU that exhibit long-term persistence and stability”). Recovery units 6 and 7 are in the greatest need of additional work, due to small numbers of populations and metapopulations in those units.

Chiricahua Leopard frog Accomplishments in the Mogollon Rim Region, AZ in 09

RU 5: Mogollon Rim – Verde River

Participants: Tonto NF, Apache-Sitgreaves NF, Coconino NF, AGFD, Phoenix Zoo, AGFD Bubbling Ponds Hatchery, USFWS, Ray Tanner

Review of 2009:

Buckskin Hills, Coconino NF: This area of a previously strong metapopulation was extirpated until captive stock was reestablished in 2008 at Middle Tank. That reestablishment has been a great success. In September 2009, a minimum of 112 Chiricahua leopard frogs were observed, at least 40 or so of which were adult/subadults. This site is on its way to being a robust breeding population that could serve as a source of animals for reestablishments elsewhere in the Buckskin Hills. On 27 July 2009, 31 frogs were released at Walt’s Tank. These were mixed Gentry/Buckskin frogs bred and reared at the Phoenix Zoo. Twelve frogs were observed at Walt’s Tank in September. Wedge fences were completed at 5 tanks (Sycamore Basin, Middle, Black, Walt's and Buckskin) - this will keep livestock from accessing the entire perimeter of the tanks and preserve some aquatic and herbaceous vegetation for frogs. Soldier Mesa Tank was treated with piscicide to remove green sunfish. Several sites are ready to receive frogs in 2010. There is good potential for rebuilding a metapopulation in the Buckskin Hills.

Ellison/Lewis Creek and Vicinity, Tonto NF. This area, which has supported frogs intermittently since 1996, was targeted for reestablishments in 2009. On 17 July, 82 tadpoles and 90 frogs were released into Lewis Creek, and 82 tadpoles and 118 frogs were released at tributary 4 of Ellison Creek. These animals originated from egg masses collected at Crouch Creek. They were hatched out at the Phoenix Zoo and reared at Bubbling Ponds Hatchery. On 11 September 2009, 443 (295 at Low Tank and 148 at Moore Saddle Tank 2) frogs and 944 tadpoles/recent metamorphs were released at two stock tanks west of Ellison Creek. These animals originated from egg masses collected at Crouch Creek and were reared by the Phoenix Zoo. If these reestablishments are successful, there is a good potential for building a metapopulation of frogs.

Gentry/Crouch/Cherry Ck, Tonto NF. Frogs are extant at 5 sites, at least 4 of which support breeding. These sites loosely form a metapopulation; however, it is currently lacking a robust breeding population. Sites are being evaluated that could sustain a large, robust breeding population. Bullfrogs will be eliminated from one of those sites, Trail Tank, in spring 2010. On 25 June, 2 egg masses were collected from Crouch Creek; 1 was transplanted to Pine Spring and the other to HY Tank. Monitoring and evaluation of sites also occurred. *Bd* was detected in a Chiricahua leopard frog from Cherry Creek. This is the first *Bd* positive Chiricahua leopard frog from the Mogollon Rim region of Arizona. Will need to monitor to determine any potential effects to individuals and populations.

Summary: *This recovery unit is not yet close to meeting the required number of metapopulations and isolated robust populations needed for recovery; however, it is on a trajectory to achieve viable metapopulations in the 3 areas listed above. In a few years, if trends continue, this recovery unit could be meeting the recovery criteria.*

RU 6 (AZ Portion): Mogollon Rim – Upper Gila

Participants: A-S NF, AGFD, USFWS, George Gann

Review of 2009:

A breeding colony of Three Forks frogs is being maintained at the AGFD Pinetop Office. Progeny from that facility have been translocated to Concho Bill and Sierra Blanca Lake; however, despite multiple years of releases, the frogs are either not persisting at Sierra Blanca Lake or are very difficult to detect. Coleman Creek, Campbell Blue Creek, and Upper Cienega Creek all need to be thoroughly surveyed for extant populations and potential reestablishment sites. Chiricahua leopard frogs have been observed in these areas during the last decade; they may still support frogs. Eight tadpoles and 24 frogs were released to a SHA property near Concho on 29 May. On 21 September 2009, 30 additional Three Forks frogs were released at this SHA property. This site is just outside of RU 6. On the same date, 25 Three Forks frogs were released at the Concho Bill site to augment that population. Other potential release sites have been identified (Unnamed Tank and Spring-Open Draw, Unnamed Pond SW of Open Draw, Prescribed Tank, and Firebox Lake). Frogs are only known to be extant at Concho Bill and the Gann property in (and near) RU6 in AZ. An RU 6 Local Recovery Group Meeting is scheduled for 25 February 2010 at the Pinetop AGFD Office from 0900-1500.

Summary: *Recovery still has a long ways to go in this RU. Currently, the AZ portion of the RU is not contributing much and we have lost breeding populations since the species was listed. There are additional populations in the NM portion of RU 6, but they continue to be at risk from Bd. In Arizona, potential reestablishment sites are limited by crayfish and non-native fishes. Planning should focus on establishing a metapopulation in the Arizona portion of the RU.*

RU 7 (AZ portion): Upper Gila – Blue River

Participants: A-S NF, AGFD, USFWS

Review of 2009

Limited monitoring occurred in 2009. Four sites (all breeding sites) are known to support frogs in the AZ portion of RU 7, all on the Clifton Ranger District of the A-S. Two of the sites are close enough to exchange individuals, but the other two appear to be isolated. There may be potential to build a metapopulation that would connect Rattlesnake Pasture Tank, Right and Left Prongs of Dix Creek, and Coal Creek. Need coordination with recovery efforts in the NM portion of RU 7, where frogs have been at only one site (Blue Creek in the Burro Mtns - where they breed) in recent years. The breeding populations in AZ could provide stock for reestablishments on the NM side.

Summary: *Considerable work is needed in this RU to meet the recovery criteria; however, there are four breeding populations with which to work. Need to develop a strategy for establishing sufficient local populations to build a metapopulation(s).*

Major Funding Initiatives and Studies:

Central Arizona Project: Under a biological opinion for the Central Arizona Project (CAP), the Bureau of Reclamation will transfer \$100,000 to the FWS for Chiricahua leopard frog recovery projects. Funds are expected to be transferred in July 2010. In November 2009, the CAP Technical Committee approved 7 projects: 1) Support for Arizona-Sonora Desert Museum captive propagation and headstart program. **Total Project Cost: \$23,236.** 2) Purchase of equipment and gear to conduct field work and disease testing. **Total Project Cost: \$9,326.30.** 3) Development and maintenance of Chiricahua Leopard Frog captive rearing facilities in Arizona, other than at ASDM. **Total Project Cost: \$6,000.** 4) Operational costs for head-starting facilities at New Mexico FWS Office. **Total Project Cost: \$10,000.** 5) Operational costs for Ranarium at the Ladder Ranch. **Total Project Cost: \$14,000.** 6) Refugia in steel rim tanks, New Mexico. **Total Project Cost: \$8,000.** 7) Renovation of priority Chiricahua leopard frog habitats. **Total Project Cost: \$29,437.70**

National Fish and Wildlife Foundation Sky Islands Grasslands Initiative: This is a multi-year, multi-million dollar funding initiative to conserve grasslands and associated imperiled species in southeastern Arizona, southwestern New Mexico, and adjacent portions of Mexico (RUs 1-4). One project was funded this year that targets conservation of Chiricahua leopard frogs and other aquatic species at Las Cienegas in RU 2. NFWF is taking pre-proposals 1 April and 1 September of each year. Grants require a 1:1 non-federal match.

Department of Homeland Security: As mitigation for vehicle and pedestrian fences on the border and SBInet towers, DHS has committed to funding several Chiricahua leopard frog projects. In the Pajarito-Atascosa Mountain region (RU 1), they have committed to fund removal of bullfrogs at 5 sites. Funds for this project should come to the FWS in 2010. As part of a multi-million dollar, border-wide mitigation fund, a \$369,000 project has been proposed for predator removal and disease inventory primarily in the Scotia Canyon region (RU 2) and the Pena Blanca Lake/Sycamore Canyon/Altar Valley complex (RU 1). This latter project has yet to be approved and timing of the funding is uncertain.

USGS/FWS Science Support Grant: The research project “Efficacy of using a Bacterial Microbe as a Strategy for Resisting *Batrachochytrium dendrobatidis* infection in the Chiricahua leopard frog (*Rana chiricahuensis*)” was funded. The principle investigators are Michael J. Adams, (PI), Research Ecologist, USGS Forest & Rangeland Ecosystem Science Center, Corvallis, OR; Cecil Schwalbe, PhD (Co-PI), Ecologist and Assistant Professor, USGS SBSC Sonoran Desert Research Station, University of Arizona; and David E. Green, DVM, (Co-PI) Veterinary Pathologist, National Wildlife Health Center, Madison, WI. It is hoped that this ‘probiotics’ study may lead to a treatment for chytridiomycosis that would work for wild populations of frogs.

Range Wide Genetics Study: Melanie Culver at University of Arizona, and her students Hans-Werner Herrmann, Emannuela Mujica, and Tony Dee, assessed the genetic structure within the Chiricahua leopard frog using mtDNA and microsatellite markers extracted from samples from more than 50 sites throughout the range of the species. Based on preliminary results, on a broad scale, mtDNA analyses indicate there is evidence of historical gene flow throughout the species’ range, with the Mogollon Rim representing the historical lineage for the frog, whereas the Mexico/Hidalgo County area may represent a more recently diverging lineage. On a finer scale

there are between 9-16 distinct populations, which are localized to one region or drainage. Contrary to earlier work suggesting the Mogollon Rim frogs may be a separate species, the authors found no evidence of multiple species within currently recognized *L. chiricahuensis* and their preliminary findings reinforce previous studies indicating the Ramsey Canyon leopard frog is conspecific with the Chiricahua leopard frog.

***Bd* Treatments:** Based on finding *Bd* positive animals after employing current protocols with benzylnonium chloride, we need to re-evaluate pre-release disease protocols. In the interim, for tadpoles we are now recommending a daily 5-minute treatment in a 0.01% itraconazole solution for 11 consecutive days, as recommended by Nichols and Lamirande (2000 – Froglog 46-1). Treatment in warm water (32⁰ C for 96 hours or more) may be a feasible way to treat tadpoles (see Woodhams *et al.* 2003, Diseases of Aquatic Organisms 55:65-67).

Overview of Activities outside the Mogollon Rim (AZ) Region

Survey Training Workshops were held in Young, Arizona and Silver City, New Mexico in 09. Headstarting and captive propagation facilities were active at the Arizona-Sonora Desert Museum, Phoenix Zoo, Bubbling Ponds Hatchery, AGFD Pinetop Office, Southwest Research Station (Chiricahuas), and USFWS Ecological Services Office in Albuquerque. The Fort Worth Zoo is also holding 5 Chiricahua leopard frogs salvaged during a 2009 *Bd* die off at the Carter Ranch in New Mexico. Facilities have been developed at the Douglas High School, Arizona and Ladder Ranch, New Mexico, but are not yet stocked with frogs.

RU 1 - Frogs are likely extant at 36 sites in RU 1. Bullfrog removal is ongoing in the Peña Blanca Lake area, Sycamore Canyon region, and Altar Valley. Chiricahua leopard frogs have been found at 16 sites at Buenos Aires NWR since bullfrogs were removed. The invasion of bullfrogs into Sycamore Canyon appears to have been reversed for now. Bullfrogs have apparently been eliminated from Peña Blanca Lake and a radius of five miles from the lake. Chiricahua leopard frogs were found in several more areas in 2009, including Peña Blanca Lake. Funding from several sources is available to continue bullfrog control efforts in 2010. This recovery unit is at or exceeding the required number of metapopulations and isolated robust populations needed for recovery. If bullfrog control continues to be successful, this recovery unit should be relatively secure in the near future.

RU 2 – Chiricahua leopard frogs are likely extant at 29 sites in RU 2. In the Santa Rita Mountains, the 14 new sites documented in 2008 were found to be mostly dispersal sites; only two of those new sites supported frogs (both breeding sites) by mid 2009. The single adult female frog at the Florida Work Station was joined by 12 adult frogs from Box Canyon (salvaged from a drying pool) on 22 June. An 8' diameter, 718 gallon steel tank has been purchased and will be installed in 2010 to enhance breeding habitat in Florida Canyon. On 6 August 2009, 11 frogs and 26 tadpoles from the ASDM (the last of the captive Louisiana Gulch stock) were released at Greaterville Tank to augment the breeding population there. A comprehensive local recovery strategy for the frog and other imperiled species in the Las Cienegas region was funded by the National Fish and Wildlife Foundation (NFWF). The grant recipients include The Nature Conservancy and University of Arizona. An aggressive project to restore cienega conditions, dredge out and install a gate on the Peterson Ranch Pond, and eliminate bullfrogs was completed

in the Scotia Canyon area of the Huachuca Mountains in 2009. On 13 October 2009, 6 metamorph frogs and 238 tadpoles were captured at Beatty's Guest Ranch and released at Peterson Ranch Pond. A population was also established at a fenced tank in the San Rafael Valley. Populations of "Ramsey Canyon" leopard frogs on the east side of the Huachucas continue to struggle with *Bd* related die offs. This recovery unit is on a trajectory towards meeting the recovery criteria.

RU 3 – The Southwest Research Station (Chiricahuas) is rearing 20 tadpoles/frogs from Leslie Cyn NWR. These frogs will be bred in outdoor facilities and then introduced to a pond on the Station grounds. Opportunities are being pursued to reestablish a metapopulation of frogs in the Cave Creek/Portal area. Sky Island Alliance, in coordination with the Forest Service and Diamond A Ranch, will be implementing the Cloverdale Cienega restoration project in the Peloncillo Mountains, NM. This project, which includes filling in artificial gullies, repairing headcuts and eroded areas, returning flow to the valley bottom, and removing portions of a levee, should improve habitats for Chiricahua leopard frogs and potentially allow for a metapopulation of frogs in that area. The project is scheduled to be completed in 2010. Much work still needs to be done to achieve recovery in RU 3. Few good breeding populations exist and there are uncertainties about presence/absence at some sites in the Peloncillo Mtns. There are likely one or more populations extant in the Sierra San Luis complex in Sonora/Chihuahua, but work is needed to confirm that.

RU 4: Monitoring in 2008-9 revealed 7 occupied sites in the Deer Creek area of the Galiuro Mountains, four of which regularly or intermittently support breeding. Discussions are underway with an agate miner and AZ State Land Department to develop a permanent pond and an additional breeding site for frogs. To the north of Deer Creek, potential reestablishment sites were identified in Rattlesnake Canyon and at Powers Garden Spring. On 26 August 2009, AGFD released 19 juvenile, 3 adult males, and 4 adult females to an enclosed pond at Discovery Park in Safford. The frogs originated from the Deer Creek area. In the Dragoon Mountains, frogs are doing well at two breeding sites, including a reestablishment site – Shaw Tank; however, a 2008 reestablishment at Black Diamond Spring apparently failed. Recovery work is underway in RU 4, but we are a ways from meeting the recovery criteria. Habitats and populations are limited, but where frogs occur, threats appear low (drought is the most serious threat). A metapopulation currently exists in the Deer Creek area of the Galiuros as well as what could be the genesis of a metapopulation in the Dragoon Mtns. However, given the limited opportunities for additional populations in the Dragoons, a more prudent recovery strategy is to manage populations there as the isolated robust population for RU4 and create a 2nd metapopulation the Galiuros. This change in strategy is underway.

RU 6 – (NM) – Breeding populations of frogs remain at 6 or more sites in NM, one or two of which (Long Mesa Tank and possibly Diamond Creek) are robust populations. There is one additional reestablishment site (2008 reestablishment at Divide Well with stock from Long Mesa Tank), but reproduction has not yet been documented there. *Bd* related die offs at Trick Tank and nearby Carter Property occurred in the fall of 2008, CLF may be extirpated from these sites. 12 subadults removed from Trick Tank in August 2009, 10 lived, 7 of which were placed at the ASDM and 3 at the Fort Worth Zoo. 46 frogs and 3 late stage tadpoles that originated at Diamond Creek and were reared at the NMESO were released at Three Circles Well in October

2009. Reestablishment at Sheep Basin Tank (2008 release with stock from Long Mesa Tank) deemed unsuccessful. Frogs cannot enter or exit this contained steel rim tank.

RU7 - (NM) - The 'dispersal site' noted last year (Blue Creek, Burro Mtns) was confirmed as a breeding site in 2009, with abundant tadpoles, an egg mass, and a few frogs. The creek on BLM lands dries up regularly, suggesting most breeding and recruitment occurs on the private lands upstream. Tadpoles and 2 metamorphs were collected from Blue Creek in 09 and established in a refugium at the Jornada Experimental Range.

RU8: Sites with breeding populations of frogs in this RU include 4 locales along the Río Mimbres, several localities on the Ladder Ranch, including a strong complex of sites along Seco Creek that form a good metapopulation with at least 7 breeding subpopulations; Ash and Bolton springs east of Hurley, and Alamosa Warm Springs. Ladder Ranch: Funded in part with a FWS Partner's Program grant, 8 outdoor ranariums have been constructed as well as indoor larval rearing facility, and quarantine capabilities initially for use for CLF but may also be used for other species in need in the future. Cuchillo Negro Warm Springs (Ladder and BLM): Tadpoles were collected from Cuchillo Negro Warm Springs; however, most turned out to be *L. blairi*. One male and one female CLF reared by Jack Barnitz (BLM) were moved to the Fort Worth Zoo. Pitchfork Ranch: Approximately 220 tadpoles, hatched from 3 partial egg masses collected from Moreno Springs were moved to Patterson Well on the Pitchfork Ranch in April 09. Dead frogs from 2008 release (source was Ash Springs on Chino Mines) at this site noted in Oct 2008. Presumed *Bd* die off and that initial reestablishment was deemed unsuccessful. Alamosa Warm Springs: 28 frogs from Alamosa Warm Springs that were reared at the NMESO now reside in a steel tank at the Jornada Experimental Range as a refugial population.

Mexico: Portions of RUs 1, 2, and 3

Participants: USFWS, AGFD, CONANP, Naturalia

A 3-day Amphibian Survey, Monitoring, and Conservation Workshop was held in July 2009 at Rancho Los Fresnos, Sonora, which is owned by Naturalia – a Mexican conservation NGO, and is located in the southern end of the San Rafael Valley (RU 2). The purpose of the workshop was to build capacity for Mexican biologists, students, and agencies to conduct amphibian work in northwestern Mexico. A similar workshop was held at Los Fresnos in 2008, and amphibian workshops are planned for Los Fresnos and the Northern Jaguar Reserve, Sonora, in 2010. In March 2010, USFWS personnel will work with staff at the Reserva Ajos-Bavispe, Sonora (RU 2), on an amphibian monitoring plan. Funding is still needed to assess population status and pursue recovery opportunities in northeastern Sonora (RUs 1-3) and western Chihuahua (RU 3).