CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: Rana onca

COMMON NAME: Relict Leopard Frog

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: March 2004

STATUS/ACTION (Check all that apply):
___ New candidate
_X_ Continuing candidate
__ Non-petitioned
_X_ Petitioned - Date petition received: May 9, 2002
___ 90-day positive - FR date: ___
___ 12-month warranted but precluded - FR date: ___
_ Is the petition requesting a reclassification of a listed species?
___ Listing priority change
Former LP: ___
New LP: ___
Latest Date species first became a Candidate: June 13, 2002
___ Candidate removal: Former LP: ___ (Check only one reason)
___ A - Taxon more abundant or widespread than previously believed or not subject to a degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___ F - Range is no longer a U.S. territory.
___ M - Taxon mistakenly included in past notice of review.
___ N - Taxon may not meet the Act=s definition of Aspecies.@
___ X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Ranidae

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Nevada, Arizona, and Utah

CURRENT STATES/ COUNTIES (optional)/TERRITORIES/COUNTRIES OF OCCURRENCE: Clark County, Nevada, and Mohave County, Arizona

LEAD REGION CONTACT (Name, phone number): Diane Elam (CNO) 916-414-6464;

LEAD FIELD OFFICE CONTACT (Office, name, phone number): Southern Nevada Field Office, Michael Burroughs (702) 515-5230

BIOLOGICAL INFORMATION (Describe habitat, historic vs. current range, historic vs. current population estimates (# populations, #individuals/population), etc.):

Species Description

The relict leopard frog (Rana onca) is a medium-sized frog (1.75 to 3.5 inches (4.45 to 8.9 centimeters) in length) in the family Ranidae. Generally, the relict leopard frog is brown to grey above with greenish brown spots that are often reduced or obscure on the front of the body. The colors underneath are white to yellow with occasional grey or brown mottling. The dorsolateral folds are indistinct and end well before the groin. A light line runs from below the eye, under the tympanum, to behind the angle of the mouth.

The species was considered extinct since the 1950s, until it was rediscovered at seven sites in three relatively small areas: (1) near the Overton Arm of Lake Mead, Nevada; (2) Black Canyon near the Colorado River below Hoover Dam, in Nevada; and (3) near Littlefield, Arizona. Habitat generalists, relict leopard frogs historically probably occupied a variety of habitats including springs, streams, and wetlands characterized by clean, clear water, in both deep and shallow water, and cover/forage such as submerged, emergent, and perimeter vegetation. At higher elevations, organic muck and overhanging banks may have been important habitat features for overwintering (Jennings et al. 1995).

Historical Range/Distribution

Based on museum specimens, recent collections, and literature, the known historical distribution for relict leopard frog is springs, streams, and wetlands within the Virgin River drainage downstream from the vicinity of Hurricane, Utah; along the Muddy River, Nevada; and along the Colorado River from the its confluence with the Virgin River downstream to Black Canyon below Lake Mead, Nevada and Arizona. All historical localities are at or within a few kilometers of these rivers. This apparent restriction in proximity to the main rivers, however, may be partially an artifact of historical collecting activities. Speculatively, the relict leopard frog may have also occurred at lowland localities along the Colorado River upstream from the confluence with the Virgin River, but no known specimens exist from this area (Jennings et al. 1995).

Current Range/Distribution

Relict leopard frogs are currently known to occur only in two general areas in Nevada: near the Overton Arm area of Lake Mead, and Black Canyon below Lake Mead. Both areas represent historical localities, with specimen records dating from 1936 at the Overton Arm area and from 1955 at Black Canyon. These two areas, encompassing maximum linear extents of only 2,2 and 3.2 miles (mi) (3.6 and 5.1 kilometers (km)), respectively, comprise a small fraction of the historical distribution of the species. The Service estimates that the current distribution is less than 20 percent of the historic distribution. Although relict leopard frog populations may possibly occur in other localized areas, it is unlikely that many other occupied sites exist given the efforts made to date by Jennings et al. (1995), Bradford et al. (in prep.), and surveys for amphibians and fish conducted or sponsored by State and Federal agencies in Utah, Arizona, and

Nevada over the past two decades (Platz 1984; BIO-WEST Inc., 2001). In the Fall of 2002, 109 captive-reared frogs were translocated to Sugarloaf Spring, a site on within the historical range of the species and on Lake Mead National Recreation Area (LMNRA) in Arizona. At present, the entire population occurs within the LMNRA administered by the National Park Service (NPS).

A total of 64 localities were searched following rediscovery of the relict leopard frog; 12 of which were historical localities for relict leopard frog. Some other historical localities were not searched because either suitable habitat is no longer present, or the site could not be reliably located. Leopard frogs were found at only seven sites (Jaeger et al. 2001), two of which subsequently are believed to have been extirpated (Littlefield, Arizona and Corral Spring, near the Overton Arm of Lake Mead, Nevada). All seven localities were either historical localities (Littlefield; Blue Point, Rogers, and Corral Springs) or within a few kilometers of historical localities (Boy Scout, Salt Cedar Tributary, and Bighorn Sheep Springs). In addition, two leopard frogs have been observed on different occasions in 2000 and 2001 at the fish hatchery at Willow Beach, Arizona, located 6 mi (10 km) downstream from Bighorn Sheep Spring in Black Canyon (C. Fiegel, Willow Beach Fish Hatchery, Service, pers. comm. 2000). One of these frogs was collected and confirmed as R. onca based on mitochondrial DNA sequence similarity (C. Fiegel, Service, pers. comm. 2001). This individual was likely swept downstream from the occupied sites in Nevada. In comparison, the current distribution of the relict leopard frog is markedly less than the historic distribution.

Relict leopard frogs collected as small tadpoles from Bighorn Sheep Spring in 2000 and eggs in 2001 were headstarted at the NPS headquarters in Boulder City, Nevada. These frogs were released to the Boulder City Wetlands, an artificial wetlands in downtown Boulder City in 2000 and 2001, and Sugarloaf Spring, a small spring and stream in Black Canyon in 2002 (S. Romin, NPS, pers. comm. 2002). While frogs were still present at the wetlands in low numbers in January 2003, bullfrogs, crayfish and nonnative fish invaded or were illegally introduced to the wetlands. This area is no longer considered a refuge for relict leopard frogs because of these threats and lack of support for continuing the flow of water to the wetlands. Sugarloaf Spring was chosen as a release site because it was a natural site with approximately 2,952 feet (ft) (900 meters (m)) of habitat within close proximity to known populations in Black Canyon, inaccessible to the public due to security restrictions for Hoover Dam, and was free of known threats to relict leopard frogs. This site is intended to function as another population of wild relict leopard frogs. A total of 113 frogs and tadpoles were released in September 2002. On March 28, 2003, an NPS biologist observed at least four adult frogs in the release area. An additional 175 frogs were released in May 2003 at Sugarloaf Spring. Ongoing translocation efforts will continue at this site until a population is established with natural recruitment or it is determined to be unsuccessful.

In May 2003, the Service fish hatchery at Willow Beach, Arizona was approved as a captive-rearing facility for relict leopard frogs. On February 17, 2004, a pair of frogs produced the first clutch of eggs at the facility where 11 adults are maintained.

Population Estimates/Sizes

Visual encounter surveys (VES) have been conducted multiple times at all sites, and mark-recapture efforts have been done at two sites where populations remain (Bradford et al., in prep.). At the upper segment of Blue Point Spring in the Overton Arm area, 13 visits occurred over the 2-year period, from 1995 to 1996. The estimated number of frogs at Blue Point Spring averaged 36, and estimated annual survivorship averaged 0.27. VESs between 1991 and 2001 at this site showed considerable variation in numbers encountered (4 to 32 frogs over a 1,263 ft (385 m) reach; n = 23 visits). At Bighorn Sheep Spring in Black Canyon, which extends approximately 1,476 ft (450 m) in length, a single mark-recapture effort in March-April 2001 yielded an estimate of 637 adults. VESs on 3 to 4 visits during 1997-2001 at the sites in Black Canyon yielded average counts of 110, 5, and 13 at Bighorn Sheep Spring, Salt Cedar Tributary Spring, and Boy Scout Canyon Spring, respectively.

To obtain a rough estimate of the total number of relict leopard frog adults, a combination of mark-recapture estimates of population size, VES, and estimates for extent of available habitat was used (Bradford et al., in prep.). This effort yielded an estimate of approximately 1,100 for the total population of adult relict leopard frogs.

At Corral Spring, relict leopard frogs were counted and marked during 16 visits between November 1991 and December 1995. The maximum number of relict leopard frogs observed of all sizes was 40, but the population was extirpated by early 1995. Between 1991 and 1995, habitat change was conspicuous at Corral Springs. The pools that were initially largely open with scattered emergent vegetation became choked with emergent vegetation, primarily native Scirpus spp. By early summer of 1994, most of these pools had virtually no open water. This extirpation may have been the result of natural processes, because individuals may periodically colonize this site from Rogers Spring during wet periods after the site is scoured by flood waters, and populations may subsequently be extirpated due to shrinkage of aquatic habitat and vegetation encroachment as drier conditions prevail. The surveys were initiated in late 1991, a year with high-precipitation storms associated with an El Nino/Southern Oscillation event that scoured vegetation at Corral Spring. Moreover, aquatic habitats were more extensive along the creek below Rogers Spring than in subsequent years. During such wet times, relict leopard frogs possibly could colonize Corral Spring from Rogers Spring by traveling 2 mi (3 km) along a shared drainage channel that currently contains desert wash habitat, or by traveling 1 mi (1.6 km) straight-line distance. Such dispersal distances have been reported for other Rana species, albeit in more mesic environments (Marsh and Trenham 2001). It is not known whether relict leopard frogs persisted at Corral Spring between 1957, when several specimens were collected, and 1991. The demise of the relict leopard frog at Corral Spring may also have been facilitated by the construction of a fence in 1991 to exclude feral burros from most of the site, an action that encouraged overgrowth of emergent vegetation.

At the Littlefield, Arizona site, relict leopard frogs were observed during the daytime in 1992 and 1996, and six adults were counted at night in both April and July 1998. None of the individuals captured in July were those marked in April. No relict leopard frogs were found during three nighttime surveys between March and May 2001. Bullfrogs (R. catesbeiana) were observed in an artificial pond at the site in 1992 and 2001, whereas relict leopard frogs were observed only

within open marshy habitat near one of the spring sources. As at Corral Spring, the demise of the relict leopard frog population occurred concomitantly with loss of pool habitat due to rapid encroachment of emergent vegetation. Between 1992 and 2001, vegetation cover (primarily Scirpus spp.) had increased dramatically such that no pools of open water remained exposed except for the artificial pond. This rapid encroachment may have resulted from anthropogenic processes. Historically, prior to the establishment of reservoirs in the Virgin River watershed, the emergent vegetation at the Littlefield site would have been scoured periodically by flooding of the Virgin River. Until some years ago, vegetation in part of this area was kept open by light to moderate livestock grazing. Subsequently, with the absence of both flood action and grazing, emergent vegetation grew over virtually all the former open water at the site. Moreover, introduced bullfrogs, which may prey on the relict leopard frog, have become established in wetlands along this portion of the Virgin River (BIO-WEST, Inc., 2001).

THREATS (Describe threats in terms of the five factors in section 4 of the ESA providing specific, substantive information. **If this is a removal of a species from candidate status or a change in listing priority, explain reasons for change**):

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Connectivity among the extant populations has almost certainly been dramatically reduced as a result of damming the Colorado River. The formation of Lake Mead in 1935 apparently eliminated at least one population located between the Overton Arm and Black Canyon areas (Cowles and Bogert 1936), and presumably eliminated any potential for dispersal of frogs between these two areas. In Black Canyon, the control of river flow for power management since 1935 and the formation of Lake Mojave in 1951 presumably have dramatically impeded dispersal among the sites, which are separated from each other by 1.1 to 3.1 mi (1.8 to 5.0 km) via the Colorado River. The loss of connectivity is a result of a wider waterbody created when the Colorado River was dammed, thus preventing frogs from moving from one side of the river to the other. Here, the river level is influenced by Lake Mojave such that the canyon floor is never exposed, predatory game fishes are present in the river, and water is continually cool because it emerges from the bottom of Lake Mead. Nevertheless, downstream movement appears possible as suggested by the observations of individual relict leopard frogs at Willow Beach, 6 mi (10 km) downstream from the nearest known population. Within the Overton Arm area, dispersal of relict leopard frogs may be possible between Blue Point and Rogers Springs. These sites are separated by a minimum of 1 mi (1.6 km). Moreover, two relict leopard frogs have been observed by NPS staff at a small spring located between Rogers and Blue Point Springs.

The causes for the population declines of this species are not entirely clear, but suggested factors include alteration of aquatic habitat due to agriculture and water development, and the introduction of exotic predators and competitors (Jennings 1988; Jennings and Hayes 1994). The formation of Lake Mead in 1935 and Lake Mojave in 1951 inundated scores of river miles and adjacent associated scattered wetlands. Moreover, wetland habitat has been converted to agriculture or urban development near the Virgin and Muddy Rivers in Utah, Arizona, and Nevada. Also, along the Virgin River, the hydrological regime has been substantially changed by upstream impoundments, diversions, and ground water pumping (BIO-WEST, Inc., 2001).

B. Overutilization for commercial, recreational, scientific, or educational purposes.

No known threats.

C. Disease or predation.

Little is known of pathogens and parasites of relict leopard frogs. Two important pathogens, chytrid fungus and viruses, have been the focus of recent research. Twenty nine adult/subadult leopard frogs, two larval leopard frogs, and two treefrogs collected from populations experiencing mortality events at eight sites were found to have characteristic lesions of chytrid fungus infections (Batrachochytium dendrobatidis) (Bradley, et al. 2002). All outbreaks in Arizona have been cool season phenomena. Presently, chytrid fungus has not been confirmed as a pathogen of relict leopard frogs, however there is no reason to think that relict leopard frogs would be immune to this pathogen.

Exotic species, which are often implicated as serious predators and competitors of native ranid frogs in the western U.S., have become widely distributed along the Virgin, Muddy, and Colorado Rivers. Included among these are the American bullfrog, many species of exotic fishes, and red swamp crayfish (Procambarus clarkii) (Jennings and Hayes 1994). These species potentially predate all life stages of the relict leopard frog. Bullfrogs also negatively impact native amphibians through competition for prey and coversites. Crayfish and exotic fishes may be important predators on eggs and larvae of relict leopard frogs.

D. The inadequacy of existing regulatory mechanisms.

In Nevada, some legal protections are afforded the relict leopard frog by the Nevada Division of Wildlife (NDOW). The Nevada Administrative Code (NAC) 503.075 classifies the relict leopard frog as protected, which requires a permit to collect or possess them but not their habitat. Habitat protection for the relict leopard frog is provided by NAC 504.520 which prohibits alteration of a wetland or stream to the detriment of wildlife without a permit. Nevada Revised Statutes (NRS) 503.587 allows the Wildlife Commission to use its authority to manage land to carry out a program for conserving, protecting, restoring and propagating selected species of native fish, wildlife and other vertebrates and their habitats which are threatened with extinction and destruction. Also, NRS 533.367 states that before a person may obtain a right to the use of water from a spring or water that has seeped to the surface of the ground, he must ensure that wildlife which customarily uses the water will have access to it. However, the State engineer, who oversees all water rights, may waive this requirement for a domestic use of water.

In Arizona, some legal protections are afforded to the relict leopard frog by the Arizona Game and Fish Department (AGFD). The species is classified as Wildlife of Special Concern in the State, and Commission Order 41 of the AGFD regulations prohibits collection or hunting of relict leopard frogs in Arizona, except when done under the authority of a special permit. Protection under Commission Order 41 provides protection to individuals, not habitat.

In Utah, some legal protections are afforded to the relict leopard frog by the Utah Division of Wildlife Resources. The relict leopard frog is classified as a Sensitive Species in Utah. State of Utah Rule 657-3 prohibits the collection, importation, and possession of relict leopard frogs without a certificate of registration but provides no protection of habitat.

Legal protection is afforded to the relict leopard frog by the National Park Service at Lake Mead NRA under 36 CFR Part 2, which prohibits unauthorized possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state any living or dead wildlife or fish, or the parts or products thereof. Extant populations of the relict leopard frog on NPS lands are afforded protection under the National Park Service Organic Act. This protection does not apply to populations outside the park boundary that may currently exist or that recolonize these areas. Protection of relict leopard frogs on NPS lands may be adequate to maintain the existing populations but inadequate to protect populations that become established elsewhere.

The Lacey Act (16 U.S.C. 3371 et seq.), as amended in 1982, provides some protection for the relict leopard frog. This legislation prohibits the import, export, sale, receipt, acquisition, purchase, and engagement in interstate or foreign commerce of any species taken, possessed, or sold in violation of any law, treaty, or regulation of the United States, any Tribal law, or any law

or regulation of any State. The relict leopard frog is not protected by the Convention on International Trade in Endangered Species of Wild Fauna and Flora, which regulates international trade.

Adequacy of these laws: State regulations support Federal regulations which focus on protection of relict leopard frogs (NDOW) and water resources (State Engineer). All known extant populations of the relict leopard frog, occur within the LMNRA which is managed by the NPS. As stated above, NPS regulations offer protection to the relict frog and its habitat, though the enforcement of regulations that prohibit transport and release of nonnative predators is difficult at best. LMNRA receives a high number of visitors each year which results in a proportionate number of law enforcement issues. Existing law enforcement staff appear to be unsuccessful in preventing the transport and release of nonnative predators at all sites occupied by relict leopard frogs on LMNRA. State law provides limited protection to relict leopard frogs and to a lesser degree, their habitat. The existing protection afforded this species may be inadequate because the current status of the species is likely inadequate to ensure for long-term persistence of the species. Presently, rangewide efforts are lacking to restore, or recover the species to approximately its former numbers and distribution. State wildlife agencies do not provide incentives to private landowners and local governments for conservation programs to benefit the species.

E. Other natural or manmade factors affecting its continued existence.

The relict leopard frog is further threatened by the low numbers of individuals within each population, some of which may not be viable. Amphibians are thought to have a metapopulation structure (i.e., groups of individuals inhabiting a system of habitat patches connected by migration across contiguous habitat). Populations that occur in isolated patches may be extirpated by stochastic events such that recolonization may not occur due to the distance of separation and absence of contiguous habitat. Genetic drift and inbreeding depression may also occur as a result of restricted gene flow associated with small, isolated populations, thus further threatening their persistence.

FOR RESUBMITTED PETITIONS: (N/A)

a. Is listing still warranted? ___
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? ___
c. Is a proposal to list the species as threatened or endangered in preparation? ___
d. If the answer to c. above is no, provide an explanation of why the action is still precluded.

In May 2002, the Service was petitioned to list the relict leopard frog as an endangered species under the Endangered Species Act (Center for Biological Diversity and Southern Utah Wilderness Alliance 2002). The petition was largely based on the restricted distribution of the known populations and low numbers of individuals of the species. We considered the petition in this assessment and incorporated information from the petition where appropriate.

Since publication of the 2002 CNOR, the publication of a proposed rule to list this species has been precluded by other higher priority listing actions, and based on work scheduled we expect

that will remain the case for the remainder of Fiscal Year 2004. Almost the entire national listing budget has been consumed by work on various listing actions taken to comply with court orders and court-approved settlement agreements, emergency listing, and essential litigation-related, administrative, and program management functions. We will continue to monitor the status of the relict leopard frog as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

LAND OWNERSHIP (Estimate proportion Federal/state/local government/private, identify non-private owners):

All known populations occur on LMNRA, administered by the NPS, with the exception of one site on private lands in Arizona (Littlefield) which is believed to be extirpated.

PRELISTING (Describe status of conservation agreements or other conservation activities):

The NPS, in cooperation with various other Federal, State, and local partners, including the Service, have been developing a conservation agreement and strategy which is intended to improve the status of the species through prescribed management actions and protection. The effort to develop the plan began in March 2001 and a final draft is anticipated by July 2004. Ongoing management and conservation activities continue under the direction of the Relict Leopard Frog Working Group including captive rearing tadpoles for translocation and refugium populations, habitat and natural history studies, monitoring, and translocation. The effectiveness of the plan in achieving adequate conservation for the relict leopard frog will remain unknown until the plan is completed and implemented but is developed to conform the Service's Policy for Evaluating Conservation Efforts (68 FR 15100).

REFERENCES (Identify primary sources of information (e.g., status reports, petitions, journal publications, unpublished data from species experts) using formal citation format):

BIO-WEST, Inc. 2001. An ecological evaluation of the lower Virgin River riparian corridor: final report. Submitted to the Southern Nevada Water Authority, Las Vegas, Nevada.

Bradford, D.F., A.C. Neale, M.S. Nash, D.W. Sada, and J.R. Jaeger. Habitat patch occupancy by the red-spotted toad (Bufo punctatus) in a naturally fragmented, desert landscape. Manuscript in review.

Bradford, D.F., J.R. Jaeger, and R.D. Jennings. Status and distribution of remnant populations of the relict leopard frog (Rana onca). Manuscript in preparation.

Bradley, G. A., P. C. Rosen, M. J. Sredl, T. R. Jones, and J. E. Longcore. 2002. Chytridiomycosis in native Arizona frogs. Journal of Wildlife Diseases 38(1):206-212.

Center for Biological Diversity and Southern Utah Wilderness Alliance. 2002. Petition to list the relict leopard frog as an endangered species under the Endangered Species Act. Submitted to the Secretary of Interior, May 8, 2002.

Cowles, R.B. and C.M. Bogert. 1936. The herpetology of the Boulder Dam region (Nevada, Arizona, Utah). Herpetologica 1:33-42.

Jaeger, J.R., B.R. Riddle, R.D. Jennings, and D.F. Bradford. 2001. Rediscovering Rana onca: Evidence for phylogenetically distinct leopard frogs from the border region of Nevada, Utah, and Arizona. Copeia 2001:339-354.

Jennings, R.D., B.R. Riddle, and D.F. Bradford. 1995. Rediscovery of Rana onca, the relict leopard frog, in southern Nevada with comments on the systematic relationships of some southwestern leopard frogs (Rana pipiens complex) and the status of populations along the Virgin River. Report prepared for Arizona Game and Fish Dept., U.S. Bureau of Land Management, Las Vegas Valley Water District, U.S. National Park Service, and Southwest Parks and Monuments Association. 71 pp.

Jennings, M.R. 1988. Rana onca Cope, relict leopard frog. Catalogue of American Amphibians and Reptiles 417:1-2.

Jennings, M.R. and M.P. Hayes. 1994. Decline of native ranid frogs in the desert southwest. Pp. 183-211 in P.R. Brown and J.W. Wright (eds.) Herpetology of the North American Deserts, Southwestern Herpetologists society, Special Publ. No 5.

Jennings, R.D., B.R. Riddle, and D.F. Bradford. 1995. Rediscovery of Rana onca, the relict leopard frog, in southern Nevada with comments on the systematic relationships of some southwestern leopard frogs (Rana pipiens complex) and the status of populations along the Virgin River. Report prepared for Arizona Game and Fish Dept., U.S. Bureau of Land Management, Las Vegas Valley Water District, U.S. National Park Service, and Southwest Parks and Monuments Association. 71 pp.

Linsdale, J.M. 1940. Amphibians and reptiles in Nevada. Proceedings of the American Academy of Arts and Science 73:197-257.

Marsh, D.M., and P.C. Trenham. 2001. Metapopulation dynamics and amphibian conservation. Conservation Biology 15:40-49.

Platz, J.E. 1984. Status report for Rana onca. Unpublished report submitted to Office of Endangered Species, U.S. Fish and Wildlife Service, Albuquerque, New Mexico. 27 pp.

LISTING PRIORITY (place * after number)

THREAT

Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5*
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude: The magnitude of threats to the relict leopard frog are high based on its limited numbers and distribution, the presence of non-native predators, potential alteration of remaining habitat including groundwater pumping, and diversion of surface water.

Imminence: Threats are not considered imminent at this time. Although the numbers are low and distribution is limited, efforts are underway to improve habitat and increase numbers through captive rearing and translocation. There are no proposed projects that may result in further habitat degradation.

APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes to the candidate list, including listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all additions of species to the candidate list, removal of candidates, and listing priority changes.

Approve: Kenneth McDermond March 11, 2004
Acting Manager, Date
California/Nevada Operations
Fish and Wildlife Service

Concur: Steve Williams April 5, 2004
Director, Fish and Wildlife Service Date

Do not concur:_____
Director, Fish and Wildlife Service Date

Director's Remarks:
_____
_____
_____

Date of annual review: March 2004
Conducted by:_____

Comments:
_____
_____
_____

(Rev. 8/02)