CANDIDATE ASSEMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Kinosternon sonoriense longifemorale*

COMMON NAME: Sonoyta mud turtle

LEAD REGION: Region 2

INFORMATION CURRENT AS OF: January 21, 2003

STATUS/ACTION (Check all that apply):
___ New candidate
_X_ Continuing candidate
    _X_ Non-petitioned
    ___ Petitioned - Date petition received: ___
        ___ 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: _____
___ 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: Reptiles, *Kinosternidae*

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Sonora, Mexico and Arizona

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Sonora, Mexico and Pima County, Arizona

LEAD REGION CONTACT: Susan Jacobsen (505-248-6641)

LEAD FIELD OFFICE CONTACT: Arizona ES Field Office, Phoenix, Glen Knowles (602-242-2720 x233)

BIOLOGICAL INFORMATION:

The Sonoyta mud turtle occurs only in one pond and limited stream habitat area at Quitobaquito Springs in Organ Pipe Cactus National Monument, Arizona, and in the nearby Rio Sonoyta, Sonora, Mexico (Ernst *et al*. 1994). The subspecies was once abundant at Quitobaquito, but the population declined from probably several hundred in the 1950s to less than 100 in the late 1980s. Juvenile survivorship has increased in recent years, and the population in 1995 was estimated at about 130 individuals (Rosen and Lowe 1996a). In the Rio Sonoyta, the subspecies is known from the Rio Sonoyta at the an apparent perennial reach approximately 4 km upstream of Sonoyta, a small reservoir formed by Sonoyta Dam in Sonoyta, near the Highway 2 bridge in Sonoyta, Sonora, from a perennial reach (El Papalote) south of Quitobaquito (Rosen and Lowe 1996b, Service files). Reaches in which the turtle has been found to date total probably less than 2 km. The species has also been observed at the Sonoyta sewage ponds adjacent to the Rio Sonoyta. The Sonoyta mud turtle likely occurs or occurred in other perennial reaches. Reaches downstream of Sonoyta have been surveyed fairly well. Arizona Game and Fish Department (AGFD) surveys in 2002 produced a preliminary estimate of 134 Sonoyta mud turtles at Quitobaquito Spring (AGFD, unpublished data). A new population was discovered in March 2002 at Quitovac, Mexico, a spring complex approximately 40 kilometers south of the town of Sonoyta (Knowles *et al.* 2002). The size of the population in Quitovac is unknown. Preliminary results from population genetics work conducted in 2002 by the University of Arizona (under contract from AGFD) indicate that the Quitobaquito/Rio Sonoyta populations are distinct from all other Arizona-New Mexico samples studied thus far. This level of distinction may not be particularly great, but there are two genetic distinctions within the Arizona-New Mexico (*K. s. sonoriensis*) group not shared with the Sonoyta mud turtle.

THREATS:

A. <u>The present or threatened destruction, modification, or curtailment of its habitat or range</u>.

Quitobaquito is a dredged and impounded pond fed by springs and seeps in nearby granite outcrops. Flow from springs may have been connected to the Rio Sonoyta via surface flows in recent times, but is now separated by approximately 1.5 km of Sonoran Desert and Mexico Highway 2. The effects of the original dredging and impoundment on the Sonoyta mud turtle are unknown. However, the imperilled status of the turtle was apparently unknown to Park Service personnel for many years. The pond at Quitobaquito was drained twice to eliminate nonnative fish and enhance habitat for the endangered desert pupfish. During these drying episodes many turtles were collected and given away as pets (Rosen 1986). The Park has since recognized the unique nature of the turtle population and has become sensitive to its management needs.

Rio Sonoyta is a disjunct stream of the Colorado River system that was likely isolated in the Pinacate Region during a volcanic activity period in the Pleistocene (Ives 1936, Hubbs and Miller 1948). Aquatic habitat in the Rio Sonoyta is being lost and degraded due to groundwater pumping, livestock grazing, urbanization, and pesticide application (McMahon and Miller 1982, Hendrickson and Varela-Romero 1989, Rutman 1997). Introduction of non-native bullfrogs (*Rana catesbeiana*) or large predaceous fish to the Rio Sonoyta could result in the species= extirpation from this system.

B. <u>Overutilization for commercial, recreational, scientific, or educational purposes</u>.

The subspecies has been illegally collected at Quitobaquito (Rosen and Lowe 1996b), but the extent of this activity is unknown. Collecting pressure in the Rio Sonoyta is unknown. Because of low population sizes and reproductive potential, any collecting, particularly of adult female turtles, could be critical to population viability.

C. Disease or predation.

No non-native predators capable of consuming mud turtles or their eggs are known from Quitobaquito or the Rio Sonoyta, with the exception of feral and domestic cats and dogs in and near Sonoyta. Introduction of non-native bullfrogs is a potential threat. Bullfrogs are known to prey on turtles and may be capable of impacting populations of mud turtles (Schwalbe and Lowe 1988). Likewise, non-native crayfish are known to prey on the Sonoran mud turtle (Scwendiman 2001) and their introduction has resulted in apparent marked population reductions at one Arizona locality (Fernandez and Rosen 1996). Concern has also been expressed over possible non-native fish introduction into Quitobaquito. Some non-native species, such as largemouth bass (*Micropterus salmoides*), are capable of preying on mud turtles. However, as yet largemouth bass are not known from Quitobaquito or the Rio Sonoyta. As recently as 1993, a new introduced species, the black bullhead (*Amieurus melas*) was collected in Quitobaquito (Minkley 1993).

A study of turtles found dead between 1989 and 1993 and pond sediments from Quitobaquito Springs was conducted. Mud turtles from Quitobaquito exhibited relatively low body lipid (fat) reserves, indicating a possible dietary deficiency. Relatively high levels of boron, chromium, selenium, strontium, and zinc in mud turtle tissues, combined with low availability of protein rich foods may be limiting turtle survival (King et al. 1996). Low lipid reserves may also result in reduced egg production. Pesticide use in agricultural lands along the Rio Sonoyta may contaminate habitats of the turtle: low levels of DDE metabolites and Dacthal, an herbicide, were found in mud turtles from Quitobaquito since 1981 (Rosen and Lowe 1996a). The effects of such pesticides on this species are unknown.

D. The inadequacy of existing regulatory mechanisms.

Collection of mud turtles in Arizona is illegal except by special permit from Organ Pipe Cactus National Monument. However, law enforcement coverage is limited and some illegal collection occurs. Arizona State law does not prohibit collection of the Sonoyta mud turtle; the bag limit is four per year, live or dead.

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

Aquatic habitat in the Rio Sonoyta is extremely dynamic due to climatic extremes (Ives 1936, Hendrickson and Varela-Romero 1989). Mud turtle populations are likely reduced due to this dynamic nature. Because turtle populations have a low intrinsic population growth rate, they are incapable of expanding rapidly to take advantage of temporary habitats created by periods of high precipitation, but populations can decline rapidly during drought years. Also, populations of mud turtles are relatively small. Small populations are vulnerable to environmental and demographic random events, which increase the probability of extinction (Shafter 1990).

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

N/A

FOR RECYCLED 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.

LAND OWNERSHIP: In the United States, 100 percent of the turtle=s habitat is owned by the National Park Service.

PRELISTING: The Service has begun discussions with Organ Pipe Cactus National Monument about the status of and potential conservation measures for this subspecies. The Phoenix Zoo has expressed interest in propagating Sonoyta mud turtles and perhaps establishing a captive population on the zoo grounds. A mailing list has been prepared for the prenotification status summary, information letter. Contracts have been let to Phil Rosen, University of Arizona, and IMADES, Hermosillo, Sonora, to define the status and distribution of the turtle in Sonora. AGFD has a Section 6 grant with the Service to develop a Conservation Agreement for the Sonoyta mud turtle. New information collected in 2002 is reflected in this summary.

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LISTING PRIORITY

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 primary threat to the Sonoyta mud turtle is its limited distribution. One small population occurs in the United States, in a spring pool less than an acre in size at Quitobaquito Springs, Organ Pipe Cactus National Monument. Populations in Mexico are similar in scale: a population in the Rio Sonoyta exists in short perennial reaches less than two kilometers long, and a population of unknown size in a spring pool complex at Quitovac. Farming and development in the Rio Sonoyta valley continues to place demands on groundwater, and surface water amounts are very limited and likely to continue to decrease.

Imminence: The Sonoyta mud turtle is highly aquatic (Rosen and Lowe 1996a). Irrigated agriculture is widespread in the Rio Sonoyta Valley, and continued development in the towns of Sonoyta and Lukeville will also place demands on water supplies. Surface water in the Rio Sonoyta is therefore likely to decrease. These small remnant populations could be rapidly eliminated by surface and ground water withdraw. The introduction of a non-native predator such as bullfrogs or crayfish could also rapidly eliminate such small populations (Fernanadez and Rosen 1996). Stochastic events such as floods, variations of annual weather patterns, predation and associated demographic uncertainty (conditions affected by chance events, such as sex ratios, that influence survival and reproduction in small populations) or other environmental stresses and human-caused factors such as chemical spills, could also lead to the rapid demise of these remnant populations.

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: Tom Bauer _____ March 14, 2003
Acting Regional Director, Fish and Wildlife Service Date

Concur: _____ _____
Director, Fish and Wildlife Service Date

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

Director's Remarks:

Date of annual review: Feb 15, 2003

Conducted by: Jim Rorabaugh

Comments: _____

(rev. 7/02)