

CANDIDATE ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Graptemys caglei*

COMMON NAME: Cagle's map turtle

LEAD REGION: 2

INFORMATION CURRENT AS OF: February 2003

STATUS/ACTION (Check all that apply):

New candidate

Continuing candidate

Non-petitioned

Petitioned - Date petition received: April 26, 1991

90-day positive - FR date: December 16, 1991

12-month warranted but precluded - FR date: January 22, 1993

Is the petition requesting a reclassification of a listed species?

Listing priority change

Former LP:

New LP:

Latest date species first became a Candidate: January 22, 1993

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 *Species*.@

X - Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Reptiles; Family *Emydidae*

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Texas

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Texas

LEAD REGION CONTACT: Susan Jacobsen, 505/248-6641

LEAD FIELD OFFICE CONTACT: Austin Field Office, Texas FWS Paige Najvar,
512/490-0057

BIOLOGICAL INFORMATION:

This highly aquatic river turtle is confined to the Guadalupe River system of Texas and optimal

habitat appears to include both riffles and pools (Haynes and McKown 1974, Killebrew 1991, Killebrew 1992). Gravel bar riffles and transition areas between riffles and pools are considered to be important since these areas are considered to be highly productive of insect prey items (Killebrew 1991).

Historical population numbers are unknown. Historical populations were reported from the Guadalupe-San Antonio River System (Haynes and McKown 1974), including voucher specimens from Kerr, Hays, Gonzales, and DeWitt counties and sight records from the San Antonio and Medina rivers.

Collectively Dixon (1987), Killebrew (1991) and Porter (1992) determined that the Cagle=s map turtle occurs in scattered sites in seven counties (Kerr, Kendall, Comal, Guadalupe, Gonzales, Dewitt, and Victoria) on the Guadalupe, San Marcos, and Blanco rivers.

Current population sizes have been estimated by marking and recapturing over 1,000 turtles. Preliminary analyses (Killebrew, pers. comm. 1994) indicate that the small population on the upper Guadalupe River (above Canyon Lake) contains no more than 400 individuals. A population model based upon ten years of data collected from a 36 kilometer (22 mile) stretch of the Guadalupe River near Cuero yielded a population estimate of between 1,354 and 2,184 individuals (Killebrew and Babitzke 1996). Below Canyon Dam, the large population on the middle Guadalupe and lower San Marcos rivers contains an estimated 11,300 individuals (Killebrew, pers. comm. 1994) including a 200-km (124-mi) core segment of the Guadalupe River between Seguin and Cuero, decreasing in abundance downstream to Victoria (83 km or 51 mi), and including a few turtles on the San Marcos River from its mouth upstream to Ottine (37 km or 23 miles) (Porter 1992).

THREATS:

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

Loss and degradation of riverine habitat from large and small impoundments (dams or reservoirs) is the primary threat to Cagle's map turtle. Cagle=s map turtle is absent from deep water/non-riverine habitat in its range (Killebrew 1991).

Cagle=s map turtles occur where the Guadalupe River empties into Canyon Lake (a 3335 hectare (8,240 acre) reservoir) and above the reservoir, but not in the lake proper (Killebrew 1991). The water released from the deeper and cooler portion of Canyon Lake may decrease the suitability of riverine habitat for Cagle=s map turtle below Canyon Dam. Cagle=s map turtle has been observed in only one small, warm pool between Canyon Lake and New Braunfels (Killebrew 1991).

One effect of impoundment is the loss of riffle and riffle/pool transition areas used by males for foraging. Depending on its size, a dam itself may be a partial or complete barrier to Cagle=s map turtle movement and could fragment a population. Construction of smaller impoundments and human activities on the river have likely eliminated or reduced foraging and basking habitats.

Senate Bill 1, comprehensive water legislation for Texas, was enacted in June 1997. With the

expected growth in Texas, the 75th Legislature put in place a water planning process designed to ensure future water needs for Texas. Texas was divided into 16 regions that will individually provide options for future water needs. Cagle's map turtle is located within Region L. As of August 2000, Region L proposed 79 possible scenarios for meeting their future water needs. Several of the proposals have the potential to affect Cagle's map turtle by altering flow and physical habitat of the Guadalupe River and existing Cagle's map turtle habitats, and inhibiting the potential for species recovery in tributaries of the Guadalupe River. These options include off-channel storage, diversion of flood water, dams, and well fields.

West Texas A&M University has conducted a study on the habitat requirements and instream flow requirements of the Cagle's map turtle on the Guadalupe River. This study, which was funded by the Edwards Aquifer Authority (EAA 2001), was completed in 2002 and is currently being reviewed by the U.S. Fish & Wildlife Service. Results suggest that the areas in which the turtle is now found are more limited than the range identified in previous studies (Killebrew *et al.* 2002).

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

The Cagle's map turtle is of interest to collectors because it is a recently described Texas endemic. The species is vulnerable to over-collecting for the pet trade, zoos, museums, and scientific studies (Killebrew 1991, 1992). Pet-trade dealers reportedly are selling Cagle's map turtles to wholesalers and have offered \$50 per hatchling and \$400 per breeding pair to collectors (Killebrew, pers. comm. 1991). Internet advertisers, Kingsnake.com, International Reptile, and Turtles-Turtles-Turtles, were selling Cagle's map turtles for \$50 to \$100 each in August 2000. International Reptile was still selling Cagle's map turtles for \$100 each in February 2002. Between 1995 and 1998 over 140,000 live *Graptemys* were exported according to the CITES Law Enforcement Division. Comments from collectors, scientists, and local residents indicate that a substantial effort is underway to collect Cagle's map turtle before it is listed (Killebrew, pers. comm. 1991, 1994, 2000).

The species also is vulnerable to target shooting (Killebrew 1992). About 5 percent of Cagle's map turtles handled in the field have shell deformities indicative of shootings (Killebrew, pers. comm. 1992).

Turtles may be incapable of sustaining historic populations under even modest levels of harvest (Warwick *et al.* 1990). Late maturation and erratic reproductive success are important considerations. Considering the rarity of Cagle's map turtle and its significant loss of habitat, collection of live specimens (especially from small populations) could result in loss of a significant portion of the surviving individuals. For small populations, this loss may not be recoverable by natural reproduction.

C. Disease or predation.

Disease and parasites are not known to be significant threats to Cagle's map turtle. To date, specimens have contained minor infections of coccidial parasites (McAllister *et al.* 1991; Killebrew, pers. comm. 1994). Whereas minor parasitic infections usually cause little harm to their host, severe infections can cause disease or stress that directly or indirectly affect host mortality.

Predation likely is insignificant for hard-shelled adult turtles, but may be more significant for their soft-shelled eggs and young (Killebrew 1992). Although many predatory birds, mammals, fish, and snakes eat turtle eggs and hatchlings, the magnitude of predation on Cagle's map turtle specifically is unknown (Harless and Morlock 1979). Additionally, small and medium-sized turtles may be more vulnerable to predation than larger turtles (Warwick *et al.* 1990). When compounded by other mortality factors, predation and parasites may further reduce Cagle's map turtle populations.

D. The inadequacy of existing regulatory mechanisms.

The Texas Parks and Wildlife Department (TPWD) listed the Cagle's map turtle as threatened, effective November 16, 2000 (Dorinda Scott, TPWD, pers. comm. 2002). TPWD regulations prohibit the taking, possession, transportation, or sale of any of the animal species designated by state law as endangered or threatened without the issuance of a permit.

On January 26, 2000, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), an international treaty, which regulates international trade in certain animals and plants, proposed Cagle's map turtle for listing under Appendix III. Appendix III includes species that any party country identifies as being subject to regulation within its jurisdiction for purposes of preventing or restricting exploitation, and for which it needs the cooperation of other parties to control trade. The Washington Office of International Affairs, Branch of CITES, hopes to finalize the Appendix III listing soon (Bruce Weissgold, USFWS, pers. comm. 2002).

Currently exploitation is not regulated at the Federal level and is minimal at the State level. Commercial exportation requires only a declaration to the Service at Ports of Entry. Between 1995 and 1998 more than 140,000 live *Graptemys* were exported. Only two are noted as Cagle's map turtle. However, if inspectors are unable to identify the *Graptemys* species from each other, they can easily be misidentified and lumped together as one species (Weissgold, U.S. Fish and Wildlife Service, in litt. 1999).

Previously the State only required a hunting license to hunt, collect or trade Cagle's map turtles. In 1999 the State implemented new regulations requiring anyone collecting animals from the wild or captive-breeding them for commercial purposes (sale or trade of dead or alive animals) to obtain a Nongame Collection Permit. In addition, anyone selling the animals is required to obtain a Dealer's Permit. Both permits require reporting; however, there is currently no method

of tracking for accuracy of reported data. Enforcement in the field is hindered by the distribution of the species in water primarily surrounded by private lands. Access to these lands is often difficult.

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

Cagle's map turtle has a naturally limited distribution and thus is more vulnerable to extinction than wider ranging species. Alterations to a single river system could change the location and suitability of nesting areas, thus affecting hatch rates and sex ratios (Wibbels *et al.* 1991). Dams and large areas of unsuitable habitat may be partial or complete barriers to Cagle's map turtle movements, preventing repopulation of decimated areas. The prevalence of limestone beds and banks (unsuitable habitat) in headwaters of the Guadalupe and Blanco rivers may naturally limit populations as well. Operation of Canyon Lake for flood control could accentuate the problem by: 1) scouring the channel free of loose substrates needed for feeding and nesting immediately below the dam (i.e., exposing bedrock); 2) reducing the magnitude and frequency of historic flood flows needed for formation and maintenance of downstream habitat, and; 3) releasing cold water that affects nest temperatures and sex ratios (Wibbels *et al.* 1991) and inhibits turtle metabolism and growth.

Erosion of river banks and water pollution may have negative impacts to the Cagle's map turtle. For example, turtle nests may not survive flooding events that overtop low elevation sandbars and erode unstable banks (Killebrew, pers. comm., 1994). In the case of water pollution, the cities of New Braunfels and Seguin are major point-sources of treated municipal wastewater on the Guadalupe River, permitted for a combined discharge of 10.2 million gallons per day. Non-point sources of pollution within the Guadalupe River watershed (fertilizers, herbicides, insecticides) also could deplete the prey base. In addition, dumping and littering, especially on the upper Guadalupe River, result in heavy accumulations of non-biodegradable debris (Albright 1994, Killebrew 1991). The capability of the Guadalupe River system to assimilate this and other nutrient loading depends on adequate stream flow.

BRIEF SUMMARY OF REASONS FOR REMOVAL OR LISTING PRIORITY CHANGE:

FOR RESUBMITTED PETITIONS:

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

Private

PRELISTING:

The Service provided section 6 funding from fiscal year 1994 through 1996 to study the populations and nesting behavior of the Cagle's map turtle. The outcome of this project was a paper entitled "Population Analysis and Nesting Study of Cagle's Map Turtle" (Killebrew and Babitzke 1996).

REFERENCES:

- Albright, E.A. 1994. Guadalupe odyssey. Texas Parks and Wildlife Magazine February: 4-13.
- Brown, C.E. 1988. Physiochemical characteristics of nine first order streams under three riparian management regimes in East Texas. M.S. thesis. Stephen F. Austin State Univ., Nacogdoches, TX. 129 pp.
- Conant, R. and J.T. Collins. 1991. A field guide reptiles and amphibians of eastern and central North America. Houghton Mifflin Co., Boston, MA. 450 pp.
- Dixon, J.R. 1987. Amphibians and reptiles of Texas with keys, taxonomic synopses, bibliography, and distribution maps. Texas A&M University Press, College Station. 434 pp.
- Edwards Aquifer Authority. 2001. Assessment of habitat requirements for Cagle's map turtle. Aquifer Science Program website:
<http://edwardsaquifer.org/Pages/theprograms/aquiferscience.html>.
- Harless and Morlock. 1979. Turtles, perspectives and research. John Wiley and Son, Inc. New York, NY. 429 pp.
- Haynes, D. 1976. *Graptemys caglei*. Catalogue of American amphibians and reptiles. pp. 184.1-184.2.
- Haynes, D. and R.R. McKown. 1974. A new species of map turtle (*Genus Graptemys*) from the Guadalupe River system in Texas. Tulane Studies in Zoology and Botany 18(4):143-152.
- Killebrew, F.C. 1991. Habitat characteristics and feeding ecology of Cagle's map turtle (*Graptemys caglei*) within the proposed Cuero and Lindenau reservoir sites. Prepared for Texas Parks and Wildlife Department under interagency contract (91-483-797) with the Texas Water Development Board, Austin. 15 pp.

- Killebrew, F.C. 1992. Habitat Characteristics and Feeding Ecology of Cagle's Map Turtle (*Graptemys caglei*) within the Proposed Cuero and Lindenau Reservoir Sites. West Texas State University, Final Report to Texas Parks & Wildlife Department, for Texas Water Development Board Contract No. 91-483-797.
- Killebrew, F. C. and J.B. Babitzke. 1996. Population analysis and nesting study of Cagle's map turtle. Final Report to U.S. Fish and Wildlife Service. Austin, Texas.
- Killebrew, F.C. and D.A. Porter. 1989. Distribution note on *Graptemys caglei*. Herp. Review 20(3):70.
- Killebrew, F.C. and D.A. Porter. 1990. Distribution note on *Graptemys caglei*. Herp. Review 21(4):92.
- Killebrew, F.C., W.J. Rogers, and J.B. Babitzke. 2002. Assessment of instream flow and habitat requirements for Cagle's map turtle (*Graptemys caglei*). Final Report to Edwards Aquifer Authority, for Edwards Aquifer Authority Contract No. 00-52-AS.
- Mace, G.M. and R. Lande. 1991. Assessing extinction threats: toward a reevaluation of IUCN threatened species categories. Conservation Biology 5(2):148-157.
- McAllister, C., S.J. Upton, and F.C. Killebrew. 1991. Coccidian parasites (Apicomplexa: *Eimeriidae*) of *Graptemys caglei* and *Graptemys versa* (Testudines: *Emydidae*), from Texas. J. Parasitology 77:205-212.
- Porter, D.A. 1992. Distribution survey of Cagle's map turtle. Final report to U.S. Fish and Wildlife Service, Austin, TX. 6 pp.
- Rudolph, D.C. and J.G. Dickson. 1990. Streamside zone width and amphibian and reptile abundance. Southwestern Nat. 35:472-476.
- Sinclair, R.M. 1971. Annotated bibliography on the exotic bivalve *Corbicula* in North America, 1900-1971. Sterkiana 43:11-18.
- U.S. Environmental Protection Agency. 1990.
- Warwick, C., C. Steedman, and T. Holford. 1990. Ecological implications of the red-eared turtle trade. Texas J. Sci. 42(4):419-422.
- Wibbels, T., F.C. Killebrew, and D. Crews. 1991. Sex determination in Cagle's map turtle: implications for evolution, development, and conservation. Can. J. Zool. 69: 2693-2696.

LISTING PRIORITY

THREAT

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

Rationale for listing priority number:

Magnitude: The loss of riverine habitat from the construction of reservoirs throughout the Guadalupe-San Antonio River System would have a major impact on this species= essential habitat. In addition, this species has already been subjected to over-collecting for the pet trade.

Imminence: Although the water plan in development by the State of Texas is considering reservoirs that have the potential to alter or destroy habitat for this species, firm plans for new reservoir construction have not been made. The state has also recently implemented new regulations for the collection and sale of animals; however, the effectiveness of these regulations in addressing the impact on Cagle=s map turtle has not been assessed.

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, annual retentions of candidates, removal of candidates, and listing priority changes.

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

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: February 2003

Conducted by: Paige Najvar

Comments: _____

