The IUCN Red List of Threatened Species

Terrapene coahuila – Endangered

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Taxonomy

Kingdom:	ANIMALIA
Phylum:	CHORDATA
Class:	REPTILIA
Order:	TESTUDINES
Family:	EMYDIDAE
Common Name/s:	AQUATIC BOX TERRAPIN (Eng) AQUATIC BOX TURTLE (Eng) COAHUILA BOX TERRAPIN (Eng) COAHUILA BOX TURTLE (Eng) COAHUILA TURTLE (Eng) WATER BOX TURTLE (Eng) TORTUE-BOÎTE DE COAHUILA (Fre) TORTUE-BOÎTE DU MEXIQUE (Fre) GALÁPAGO CAJA MEXICANO (Spa) TORTUGA COAHUILA (Spa)
Species Authority:	Schmidt & Owens, 1944
Taxonomic Notes:	No subspecies and no synonymised taxa attributed.

Assessment Information

Red List Category & Criteria:	EN A2c+4c; B1ab(i,ii,iii,iv,v)+2b(i,ii,iii,iv,v) ver 3.1 (2001)
Year Assessed:	2007
Assessor/s:	van Dijk, P.P., Flores-Villela, O. & Howeth, J.
Evaluator/s:	Buskirk, J.R., Iverson, J.B. & Rhodin, A.G.J. (Tortoise & Freshwater Turtle Red List Authority)
Justification:	Listed as Endangered A4c, B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v) because it is known from only a single location, where it is restricted to a small number of sites with appropriate habitat; its area of occupancy has shrunk from approximately 600 sq. km in the late 1960s to an estimated 360 sq. km in 2002; within this area, the species only occurs in specific marsh areas, several of which have been lost through desiccation and vegetation changes during that period. These impacts are ongoing and unlikely to be stopped and reversed in the foreseeable future. The genetic structure of the species indicates that the populations at various sites are largely isolated and the species thus qualifies as fragmented. Population surveys indicate a steep decline in the total number of animals, from 148 animals per hectare of suitable habitat in the 1960s (when suitable habitat comprised hundreds of hectares, thus likely well over 10,000 mature animals) to about 2,500 mature animals in total in 2002-2003; at an estimated generation time of 15 years (by analogy with other *Terrapene* species and observed growth rates in captivity), this is a reduction of over 70% of mature animals in three generations. The species may also qualify under criterion C1, but more robust population studies are needed to confirm this.
History:	1982 - Vulnerable (Groombridge 1982) 1986 - Vulnerable (IUCN Conservation Monitoring Centre 1986) 1988 - Vulnerable (IUCN Conservation Monitoring Centre 1988) 1990 - Vulnerable (IUCN 1990) 1994 - Vulnerable (Groombridge 1994) 1996 - Endangered (Baillie and Groombridge 1996)

Classifications

Major Habitat/s:	5.1 Wetlands (inland) - Permanent Rivers/Streams/Creeks (includes waterfalls) 5.4 Wetlands (inland) - Bogs, Marshes, Swamps, Fens, Peatlands 5.7 Wetlands (inland) - Permanent Freshwater Marshes/Pools (under 8ha) 5.9 Wetlands (inland) - Freshwater Springs and Oases
Major Threat/s:	1.1.1.2 Habitat Loss/Degradation - Agriculture - Crops - Small-holder farming (ongoing) 1.3.6 Habitat Loss/Degradation - Extraction - Groundwater extraction (present, future) 1.4.1 Habitat Loss/Degradation - Infrastructure development - Industry (ongoing) 1.4.4 Habitat Loss/Degradation - Infrastructure development Transport (land/air) (ongoing) 1.4.6 Habitat Loss/Degradation - Infrastructure development - Dams (ongoing) 4.2.2 Accidental mortality - Collision - Vehicle collision (present, future) 9.1 Intrinsic factors - Limited dispersal (ongoing) 9.2 Intrinsic factors - Poor recruitment/reproduction/regeneration (ongoing) 9.3 Intrinsic factors - High juvenile mortality (ongoing) 9.7 Intrinsic factors - Slow growth rates (ongoing) 9.9 Intrinsic factors - Restricted range (ongoing) 10.5 Human disturbance - Fire (present, future)
Conservation Action/s:	1.2.1.1 Policy-based actions - Legislation - Development - International level (in place) 1.2.1.2 Policy-based actions - Legislation - Development - National level (in place) 1.2.2.1 Policy-based actions - Legislation - Implementation - International level (in place) 1.2.2.2 Policy-based actions - Legislation - Implementation - National level (in place) 2.2 Communication and Education - Awareness (needed) 3.1 Research actions - Taxonomy (in place) 3.2 Research actions - Population numbers and range (in place, needed) 3.3 Research actions - Biology and Ecology (in place, needed) 3.4 Research actions - Habitat status (in place, needed) 3.5 Research actions - Threats (in place, needed) 4.1 Habitat and site-based actions - Maintenance/Conservation (in place, needed) 4.2 Habitat and site-based actions - Restoration (needed) 4.4.2 Habitat and site-based actions - Protected areas - Establishment (in place, needed) 4.4.3 Habitat and site-based actions - Protected areas - Management (in place, needed) 5.7.1 Species-based actions - Ex situ conservation actions - Captive breeding/Artificial propagation (in place, needed)

Distribution

Country Names:	Native: Mexico (Coahuila)

Summary Documentation

System:	Terrestrial; Freshwater
Population Trend:	

Detailed Documentation

Range:	Restricted to the Cuatro Ciénegas basin, Coahuila, Mexico (Iverson 1992, Dodd 2001).
Population:	The only available population estimate is that of Brown (1974), who calculated a density of 148 *Terrapene* per hectare of marsh during 1964-66. By the beginning of the 1990s it was believed to be uncommon, and a mark-recapture study in 2002-2003 of about two thirds of suitable *T. coahuila* habitat marked about 750 turtles with 50 to 80% recapture rates, extrapolating to a total population size at the order of about 2,500 adult animals (Howeth in litt. 26 Feb 2007).
Habitat and Ecology:	The Cuatro Cienegas basin is an hourglass-shaped intermontane basin of about 50 km long and 8 to 24 km wide (about 600 sq. km), its floor being at 720 m altitude. Much of the central part of the basin is marshy (maximum 60 cm water depth), with dry sandy slopes leading up the rocky valley slopes. Many of the marshes and ponds are spring-fed. A number of deep (up to several metres) ponds occur within the marshy area, and retain crystal-clear water throughout the year. About half the bottom is covered by dense submerged aquatic vegetation (mainly *Chara*), the other half is bare sediment. Waterlilies grow in the shallow parts, and thick stands of cattails (*Typha*) and *Eleocharis* fringe the ponds. Water temp is about 27 to 29°C. Ponds may be separated from dry nesting areas on the slopes by substantial distances (several 100 m) of flat marshy grassland. (Webb and Legler 1960). In contrast to other *Terrapene* species, *T. coahuila* is fully aquatic. Within the Cuatro Cienegas basin, *T. coahuila* occurs mainly in the shallow marshy areas, but has also been encountered in the river and clear deep pools (Dodd 2001). *T. coahuila* is largely a resident species that does not disperse widely, as indicated by both natural history studies of this aquatic species in a desert environment, and the significant differences in genotypic composition of the populations at different sites in pairwise comparisons, indicating limited gene flow between sites (Howeth in litt. 24 Jan 2007). *T. coahuila* feeds on almost equal proportions of aquatic and wind-blown insects and their larvae (54%) and plant matter (46%) (review by Dodd 2001).

	Male Coahuila box turtles can reach up to 16.8 cm CL, females remain a little smaller (Dodd 2001). The size and age at maturity have apparently not been reported. Average clutch size in captive animals varies between 3.8 and 5.0, and several clutches are produced per year (Tonge 1987, Cerda and Waugh 1992). The maximum reproductive output per female is about 11 eggs per year, but for about one-third of examined females it is as low as 6.8 eggs/year (Brown 1974 in Dodd 2001).
Threats:	The Cuatro Cienegas basin has been extensively altered in its hydrology by digging canals and groundwater pumping for local and regional agricultural irrigation, and for drinking water (Howeth in litt 24 Jan 2007, Flores-Villela in litt. 25 Jan 2007, Hendrickson in litt. 27 Feb 2007). The western side of the basin is experiencing particularly rapid aquatic habitat loss; Laguna Grande was completely dry in 2006. According to current residents of Cuatro Ciénegas, and Dr. Dean Hendrickson, this was the first time anyone had seen it dry (this encompasses at least 50 years, conservatively) (Howeth in litt 24 Jan 2007). In 2002, surveys of box turtle sites by a team including Brown (who studied the species 34 years previously) located the marshes where Brown worked in the 1960s. The survey indicates that the species has disappeared from about 40% of its former extent of occurrence, while remaining wetland areas within the area of occurrence have become less suitable (or unsuitable) as habitat for *T. coahuila* as a result of desiccation and altered vegetation structure (Howeth in litt 24 Jan 2007). Roads, railroads, pipelines and other infrastructure for industrial, logistic, tourism and recreational purposes have impacted the ecosystem, and some of these environmental impacts continue. In the last decade it is known there has been tourist development, and farming expansion continues (Reuters 2007). Roads and fires have created direct-mortality impacts (Howeth in litt. 24 Jan 2007). There is a potential threat from the global pet trade (at least partly met by captive breeding, see Conservation Actions). Hybridization is not an issue for *T. coahuila*, in contrast to its sympatric turtle species.
Conservation Measures:	Turtles in general are protected from exploitation under Mexican wildlife and natural resource legislation. T. *coahuila* is included in CITES Appendix I. The entire range of the species falls within the 843 sq. km Cuatro Cienegas Flora and Fauna Protection Area (IUCN Category VI), established in 1994. Provided no further major engineering works impact the ecological integrity of the Cuatro Cienegas basin, and the protected area regulations are adhered to, the species and its habitat should be relatively secure; however, recent and ongoing developments as well as plans for further development involve broad-scale ecological processes (water extraction, agriculture, infrastructure development) that will continue to impact the habitat in the foreseeable future. Such development must be managed and their impacts minimized as much as possible. Conservation efforts should be focused on halting habitat loss, especially in the western portion of the basin where the remaining population shows high levels of genetic distinctness (Howeth in litt., 24 Jan 2007). *Ex situ* conservation breeding has been sufficiently successful that several zoo assurance colonies now exist, and small numbers of surplus animals have transferred to dedicated hobbyists, eliminating any need for collection and smuggling of wild animals to meet very limited hobbyist demand. An updated population status report and further biological research and status monitoring are priority actions.

Data Sources

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