Morelet's Crocodile *Crocodylus moreletii*

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Common Names: Morelet's crocodile, Alligator (Belize), Cocodrilo del Petén (Guatemala), Lagarto negro, Cocodrilo de pantano (México)

Range: Mexico, Belize, Guatemala

Figure 1. Distribution of *Crocodylus moreletii*.

Conservation Overview

CITES: Appendix I (Guatemala), Appendix II (Mexico, Belize)

CSG Action Plan:
Availability of survey data: Moderate
Need for wild population recovery: Moderate
Potential for sustainable management: High

2009 IUCN Red List: LR/cd (Lower Risk, conservation-dependent; IUCN 2009) (last assessed in 2000).

Principal threats: Illegal hunting, habitat destruction

Ecology and Natural History

Morelet's crocodile is a medium-sized species (males to 4.5 m; Platt *et al*., in press) occurring in the Atlantic lowlands of the Gulf of Mexico (Mexico) and the Yucatan Peninsula (Mexico, Belize and Guatemala). Knowledge of this species has increased rapidly over the past two decades (Sigler and Gallegos 2002), and recently a great deal of research has been conducted on its distribution and status in Mexico (Sigler *et al*. 2002; Dominguez *et al*. 2004; Cedeño *et al*. 2006) and Belize (Meerman 1994; Platt *et al*. 1999; Platt and Thorbjarnarson 2000; Stafford *et al*. 2003), nesting ecology ((Platt 1996; Platt *et al*. 2008), diet and foraging ecology (Platt *et al*. 2002, 2006, 2007; Platt and Rainwater 2007); morphometrics (Platt *et al*. 2003, in press; Platt and Rainwater 2005), population ecology (Merediz 1999; Rainwater *et al*. 1998, 2000; Platt *et al*. in press) and ecotoxicology (Wu *et al*. 2000a,b; Rainwater *et al*. 2002, 2007, 2008; Rainwater 2003; Wu *et al*. 2006).

Morelet's crocodile is characterized by a broad snout, weakly keeled osteoderms on the dorsum, and irregular scale groups on the ventral and latero-ventral surface of the tail (Platt and Rainwater 2005). The species inhabits mainly freshwater areas such as marshes, swamps, ponds, rivers, lagoons and man-made waterbodies, but occasionally is found in brackish or saline habitats (Alvarez del Toro and Sigler 2001; Escobedo-Galvan *et al*. 2008; Platt *et al*. 2008).

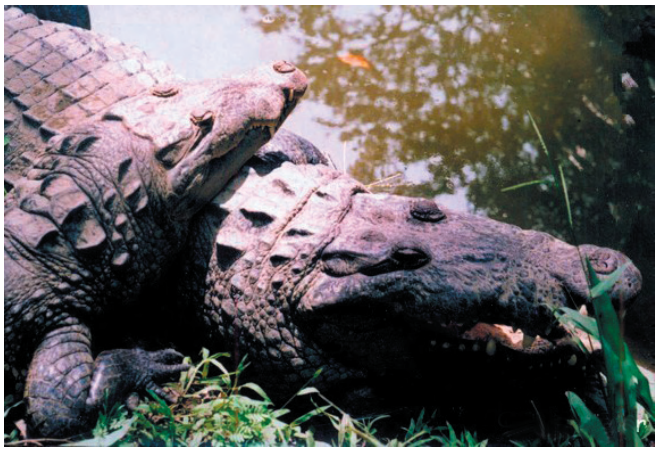

Figure 2. Adult *C. moreletii*. Photograph: Luis Sigler.

Throughout much of the southern portion of its range, *C. moreletii* occurs symmpatrically with *C. acutus*, and habitat relationships between these two species are starting to be understood (Merediz 1999; Platt and Thorbjarnarson 2000; Platt and Rainwater 2005; Cedeño *et al*. 2006). Hybridization between *C. moreletii* and *C. acutus* in the wild has been

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reported from the coastal regions of Belize (Hekkala 2004; Ray *et al*. 2004) and Mexico (Cedeño 2008; Rodriguez *et al*. 2008).

An excellent general account of many aspects of the behavior and ecology of *C. moreletii* is presented by Alvarez del Toro (1974). In the wild, females reach sexual maturity at around 7-8 years of age (1.5 m), but in captivity maturity may be reached by 4-5 years (1.3 m) (Manuel Muñiz, pers. comm.).

Females construct a mound nest of fresh and decomposing vegetation and soil, into which 20-50 eggs are laid at the end of the dry season (usually mid-May to late June or early July). Hatching occurs in August and September, when the wet season is at its peak, after approximately 75 to 85 days of incubation (Alvarez del Toro 1974; Perez-Higareda 1980; Platt *et al*. 2008).

Figure 3. Female *C. moreletii* guarding her nest. Photograph: Miguel Alvarez del Toro.

The female opens the nest with her feet and mouth, uncovers the egg chamber, and transports the hatchlings in her jaws to the waters' edge. She also breaks some eggs by rolling them between her tongue and palate, helping the hatchlings to emerge (Alvarez del Toro 1974; Hunt 1973, 1980). The female is very protective of the nest, and even more so of the hatchlings and responds readily totheir distress calls. This characteristic was once used by "lagarteros" (crocodile hunters) who imitated the distress call of hatchlings to lure adult females into gunshot range (Alvarez del Toro and Sigler 2001; Platt *et al*. 2008). Male *C. moreletii* are also known to respond to hatchling distress calls (Rainwater *et al*. 2000).

Conservation and Status

Populations of Morelet's crocodile were greatly reduced in many areas due to unregulated skin hunting, which occurred principally in the 1940s and 1950s (Alvarez del Toro 1974; Platt and Thorbjarnarson 2000). A prohibition was decreed for the region in the 1970s, but illegal hunting persisted into the 1980s and 1990s. Due to severe sanctions, illegal hunting is now thought to be minimal, but still considered to be the principal threat to population recovery in some areas. Traditional use of the species persists, especially in rural communities (Merediz 1999; Zamudio 2004).

Morelet's crocodile is legally protected in the three Range States. Legal trade in the species from Mexico is restricted to animals from CITES-registered captive breeding operations. Total annual production from the two CITES-registered farms (in 2009) was around 8000 skins, with half going to local markets and the remainder being exported (CONABIO

Figure 4. Adult male *C. moreletii*. Photograph: Scott Snider.

2006). None of the three Range States have established legal use of wild populations (CONABIO 2006).

Figure 5. Captive *C. moreletii*. Photograph: Juan Carlos Cremiux.

From 2002 to 2004, Mexico developed the "COPAN" project to assess the presence of the species across its historical range and in outlying areas; 63 localities were surveyed in 10 States (Sigler and Dominguez 2008). In Mexico, *C. moreletii* occupies an estimated area of 396,455 km^2 (estimated by GARP algorithm and based on historical and actual localities). Total historical distribution across all three Range States has been estimated as 450,000 km^2, of which 88% lies in Mexico (CONABIO 2006).

Available survey data for the three Range States: Guatemala (Castañeda 2000), Mexico (CONABIO 2006) and Belize (Meerman, pers. comm. in CONABIO 2006), suggest the relative abundance of *C. moreletii* is similar to other crocodilians that are not endangered. Morelet's crocodile populations in Belize recovered rapidly following cessation of skin hunting, and the species is now regarded as common, even occurring within urban areas such as Belize City (Platt *et al*. 2008).

Mexico successfully downlisted *C. moreletii* populations in Mexico and Belize to CITES Appendix II, with a zero quota for commercial trade in wild specimens, at the 15th CITES meeting (March 2010). Although no use of the wild population is proposed at this time, it is a possibile option in the future.

Priority Projects

High priority

1. **Status and distribution in Guatemala**: Status surveys and ecological studies should be completed. Because expansion of the agricultural frontier and cattle ranching are encroaching on crocodile habitat and recent data are lacking, the status of *C. moreletii* must be quantified as a first step towards development and implementation of a management plan.
2. **Tri-national strategy for conservation and sustainable use**: The three Range States have agreed to develop a strategy to: 1. control illegal trade along their frontiers; 2. unify and standardize methodology and technology; and, 3. promote a solid front for exportation of *C. moreletii* products.

Moderate priority

3. **Development of a management plan for Belize**: There is baseline information on the distribution and status of *C. moreletii*, but monitoring long-term population trends is a prerequisite for developing an effective management plan.

4. **Development of a sustainable use program in Mexico:** With the information derived by the "COPAN" Project, there are some localities where a ranching program could be based on Management Units for the Conservation of Wildlife (UMA), established by Environment and Natural Resources Ministry (SEMARNAT).

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Figure 6. *Crocodylus moreletii*. Photograph: Scott McMurry

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