



The soft light of evening is ideal for the forays of a band of coatis. After a long day combing the ground and trees of the low deciduous woodland, foraging for fruits and small prey animals, the boisterous group is looking for supper before retiring to their favorite tree for the night. Here in this patch of forest surrounded by flooded savanna, typical of the Petén region, the sounds of the wild slowly change as diurnal animals cede terrain to the creatures of the night. Some of the coatis are already climbing up into

the branches to reach their sleeping spots, while others are still on the ground hoping for one last snack of insect or scorpion. So occupied are they with these last-minute activities before bedtime, that they do

### Description

Morelet's crocodile, *Crocodylus moreletii* Bibron and Duméril, 1851, is a medium-sized species. Today adults rarely reach lengths of more than 3 meters, although it is possible that in the past they grew larger. ÁLVAREZ DEL TORO and SIGLER (2001) report having seen, in the late 1960s, exceptionally large skulls (left by skin hunters) decomposing in the rainforest — from their descriptions, I estimate that these crocodiles would have measured no less than 3.5 meters. The largest known *Crocodylus moreletii* is recorded as measuring 4.16 meters (PÉREZ et al. 1991), while MEREDIZ (1999)



Hypomelanistic specimens of *Crocodylus moreletii* in captivity.  
Photo: C. J. Navarro

postulates a maximum theoretical size of 4.98 meters, based on mathematical models.

*Crocodylus moreletii* has four anterior nuchal (postoccipital) scales and six posterior nuchal (cervical) scales in a more regular pattern than the nuchal scales of the American crocodile, *Crocodylus acutus*, which is also present in the region. The rest of the dorsal scales of *Crocodylus moreletii* are relatively flat, without the strong keels present in the American crocodile. One distinguishing characteristic of *Crocodylus moreletii* is that the vertical rows of scales on the sides of the tail are separated in places by isolated scales or rows of smaller scales, which do not contact the dorsal rows of large scales on the top of the tail.

## The Return of Morelet's Crocodile

# Crocodylus moreletii

Carlos J. Navarro Serment

not notice the alert eyes that follow their movements. Hidden beneath vegetation at the water's edge, a crocodile patiently awaits its opportunity....

Close-up of *C. moreletii*.  
Photo: P. Martínez Carrión





Adult *C. moreletii*. Quintana Roo (Mexico). Photo: C. J. Navarro



Male *C. moreletii* at the entrance of its cave (Guatemala). Photo: C. J. Navarro

Another morphological feature that distinguishes this species from the American crocodile is the relationship between the length and width of the head. Morelet's crocodile has a shorter and broader head. Also, the suture joining the maxilla and premaxilla bones of the upper jaw is straight and transverse in *Crocodylus moreletii*, but is V- or W-shaped in *Crocodylus acutus* (LEE, 2000; NAVARRO, 2002).

The coloration of *Crocodylus moreletii* is variable, with some individuals being darker than others. It normally has a mottled pattern of yellowish ochre and black, and larger black markings on the tail and sides. Adult males are usually darker than females, which remain more yellowish.

#### Distribution and habitat

*Crocodylus moreletii* is distributed from the Mexican state of Tamaulipas southward through the Gulf of Mexico drainage basin, and across the Yucatán Peninsula through Belize and the department of Petén, Guatemala. It prefers slow-moving fresh and brackish waters with abundant vegetation. Through most of its range it can be found in numerous lakes, rivers,

water holes, wells, and the brackish waters of coastal lagoons (ROSS, 1998; LEE, 2000; ÁLVAREZ DEL TORO and SIGLER, 2001). On the Yucatán Peninsula this crocodile abounds on the extensive grassy savanna with numerous freshwater

Morelet's crocodile digs an underground burrow in which it can take refuge during the hottest hours of the day. The burrow can be several meters long, and usually has an underwater entrance. The end of the burrow has a larger chamber with an air hole where the crocodile can spend much of its time.

Because of the commercial value of the species, many captive-breeding projects have been established. This activity has led to accidental introduction of the species outside its natural range, such as in the Chacahua lagoons, Oaxaca, on the Pacific side of Mexico (MUÑIZ et al., 1997). Currently, the greatest concentration of captive specimens is found on a private farm in the state of Sinaloa, also on the Pacific, and outside the natural range of the species (ROSS, 1998; ROMO, 2000).

#### Diet and predators

*Crocodylus moreletii* is a hunter. Hatchlings seem to relish slugs and snails, but catch and eat whatever they can, including aquatic, terrestrial, or flying insects (ÁLVAREZ DEL TORO and SIGLER, 2001). Older specimens begin to catch small crustaceans and fish, frogs and other amphibians, birds, and small



The jaws of *C. moreletii*. Photo: P. Martínez Carrión

canals, and small elevated areas of rainforest.

During the rainy season, large areas of savanna are flooded, which facilitates the spread of the crocodiles. Later, when the rains stop and the floodwaters recede, the crocodiles concentrate again in the remaining lakes and canals. This species is able to cross considerable distances over land, and isolated individuals can be found in small bodies of water deep in the rainforest.

mammals. Eventually, the crocodile may capture and devour almost any animal that comes near the water, including snakes, turtles, and larger mammals. Large Morelet's crocodiles have even been known to attack humans.

Hatchling crocodiles are prey to numerous wading birds such as the wood ibis (*Mycteria americana*), the jabiru (*Jabiru mycteria*), and the great blue heron (*Ardea herodias*). Birds of prey such as the roadside hawk (*Buteo magnirostris*) and the laughing falcon (*Herpetotheres cachinnans*) also capture small crocodiles when they get the chance. Several species of reptiles also hunt young *Crocodylus moreletii*, including the snapping turtle (*Chelydra serpentina*) and the indigo snake (*Drymarchon corais*) (ÁLVAREZ DEL TORO and SIGLER, 2001). Mammals such as the coati (*Nasua narica*), the raccoon (*Procyon lotor*) destroy the crocodile nests and eat the eggs, and the semiaquatic grison (*Galictis vittata*) captures and eats crocodile hatchlings. The tayra (*Eira barbara*), and especially the jaguar (*Panthera onca*) are able to kill and eat larger crocodiles. In areas where the two species of crocodiles are sympatric, larger specimens of *Crocodylus acutus* are able



Flooded savanna on the Caribbean coast, habitat of *C. moreletii*. Quintana Roo (Mexico). Photo: C. J. Navarro



Bodies of water within the rainforest are important habitat for *C. moreletii*. Photo: C. J. Navarro

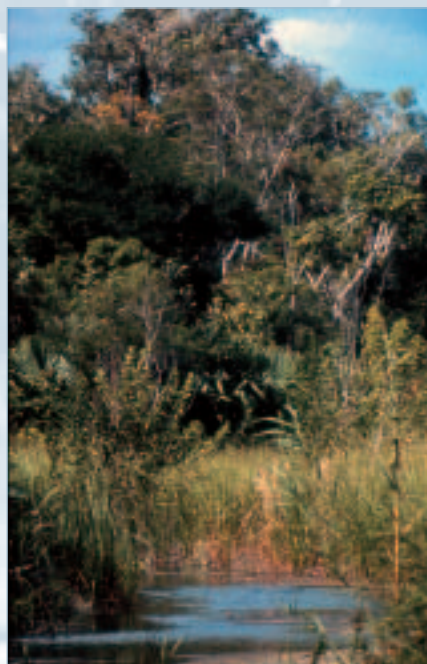


Male and female adults. Note the relatively short and broad snout typical of this species. Photo: C. J. Navarro





Adult male *C. moreletii*. Quintana Roo (Mexico). Photo: C. J. Navarro



Ideal habitat for *C. moreletii*. Photo: C. J. Navarro

on her size, the female can lay 20–40 eggs in a nest made of gathered vegetation. The nest is usually about 1.5 meters in diameter and about 90 centimeters deep, and located among the trees and shrubs within 20 meters of the water, sometimes directly on the shore. The eggs incubate in the nest for 75–80 days. At the time of hatching, offspring measure an average of 23 centimeters in total length (ÁLVAREZ DEL TORO and SIGLER, 2001).

Although practically the entire range of this species is at sea level or very low coastal elevations, specimens have been bred in captivity at 2,600 meters above sea level in Mexico City (SIGLER, 1994).

### Conservation

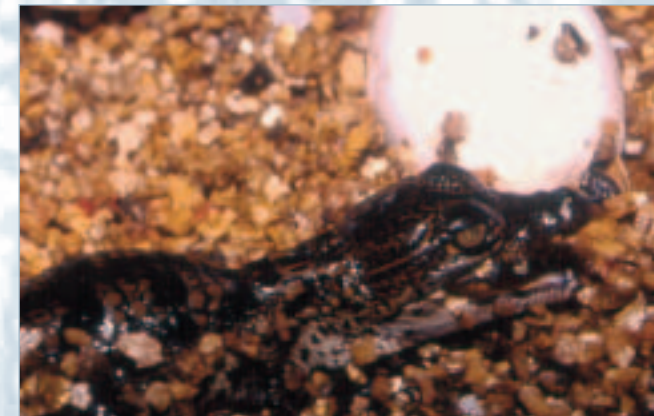
*Crocodylus moreletii* is listed in CITES Appendix I as threatened with extinction. This is largely due to extensive hunting of the species over much of its distribution area during the 1940s and 1950s. In some places, such as the Mexican states of Tabasco, Veracruz, and northern Chiapas, the populations of this crocodile declined drastically during those years. In the market of the city of Villahermosa (Tabasco) alone, an average of a one thousand crocodile skins were sold per day (ÁLVAREZ DEL TORO and SIGLER, 2001). Nonetheless, the species survived under better conditions in other areas, such as extensive flooded savanna and in small bodies of water in coastal Quintana Roo. In 1970, the Mexican Secretary of Industry and Commerce passed a permanent ban on the hunting of crocodiles and caimans, which is still in effect today (NAVARRO, 2002).

Currently, *Crocodylus moreletii* has recovered considerably, and healthy populations thrive in much of its range. This includes populations in protected areas such as the Biosphere Reserves of Maya (Guatemala), Centla Swamps (Tabasco) and Sian Ka'an (Quintana Roo), as well as in the Lacandona rainforest (Chiapas).

Although more information is needed, recent research seems to



*C. moreletii* juveniles on a farm. Sinaloa (Mexico). Photo: C. J. Navarro



*C. moreletii* hatchling on a farm. Sinaloa (Mexico). Photo: C. J. Navarro

confirm the reestablishment of Morelet's crocodile, and most specialists are in favor of changing the CITES status to Appendix II. This, along with its possible removal from the U.S. Endangered Species Act, would permit the development of new strategies for commercial use, which has been shown to be an effective tool for protecting crocodilian species in various parts of the world (MEREDIZ, 1999; NAVARRO, 2002; REUTER, 2003).

Sustainable use of *Crocodylus moreletii* could provide economic incentives to encourage local communities to participate in efforts to protect the crocodiles and their habitat (ROSS, 1998; NAVARRO, 2002). One possibility would be to establish a system of farming that would involve the collection of 50–75 percent of eggs or hatchlings from the wild (similar to the rate of natural mortality), raising them in captivity to commercial size, and

returning a percentage to the wild, where the survival rate of these larger animals is improved. For the Sian Ka'an Biosphere Reserve in particular, MEREDIZ (1999) proposes that 50 percent of eggs and 75 percent of hatchlings could be collected from the area, and raised in captivity for 3 years, after which 30 percent of the animals would be released. In this way, the reproducing population would not be affected, and the total population number



Close-up of *C. moreletii*. Photo: P. Martínez Carrión





Lateral scales on the tail of *C. moreletii*. Note the vertical rows of scales that do not reach the large dorsal scales, a characteristic that distinguishes this species from *C. acutus*. Photo: C. J. Navarro



Juvenile specimen of Morelet's crocodile about to be released after having been captured as part of a population study at the Siam Ka'an Biosphere Reserve. Quintana Roo (Mexico). Photo: P. Martínez Carrión

would tend to rise. In any case, the particular circumstances of each region must be carefully studied to determine the feasibility of this kind of project, and other complementary projects. Morelet's crocodile is currently being successfully raised by numerous farmers and breeders.

...A young coati has discovered the scent of a frog, and follows its trail to the water, without noticing that the loud chorus of calling frogs has stopped. The reddish glow of sunset paints the water, and lights the reptilian eyes that watch the approaching mammal. High above, a flock of white ibises fly over the flooded savanna in search of a dry mangrove tree to settle into for the night. Suddenly, propelled by its

powerful tail, the Morelet's crocodile lunges up onto the shore with toothy jaws wide open. Moments later, when the ripples have calmed again, the frogs resume their calling. ■

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