

**CROCODILE
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CHAIRMAN:

Professor Grahame Webb
PO Box 530, Karama, NT 0813, Australia

EDITORIAL AND EXECUTIVE OFFICE:

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COVER PHOTOGRAPH: Brown Caiman (*Caiman crocodilus fuscus*). Photograph: Jemeema Brien.

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Jose F. Gonzalez-Maya*, Mauricio Vela-Vargas, Jaime Murillo-Sánchez, Diego Zárrate-Charry* and Alexandra Pineda-Guerrero, *Proyecto de Conservación de Aguas y Tierras, ProCAT Colombia, Calle 15 #5-62, El Rodadero, Santa Marta, Colombia, <jfgonzalezmay@gmail.com>* (*Consultants, Instituto de Ciencias Naturales, Universidad Nacional de Colombia).

NEW LOCALITY RECORDS FOR ORINOCO CROCODILE (*CROCODYLUS INTERMEDIUS*) IN COLOMBIA. The Orinoco crocodile (*Crocodylus intermedius*) is the only crocodylian whose geographical distribution is limited to a single hydrologic basin - the Orinoco River basin in Colombia and Venezuela. The species is categorized as “Critically Endangered” by the IUCN and “Endangered” by the Environmental Ministry of Colombia (Resolution No 676 on 21 July 1997). The Colombian populations of the species are restricted at present to four specific areas within the Arauca, Casanare, Meta and Vichada Departments (Ministerio de Medio Ambiente 2002).

On the basis of fieldwork carried out between 1994 and 1998, Lugo (1998) estimated 153 individuals throughout 70% of the species’ distributional area in Colombia, within 4 populations (Fig. 1).

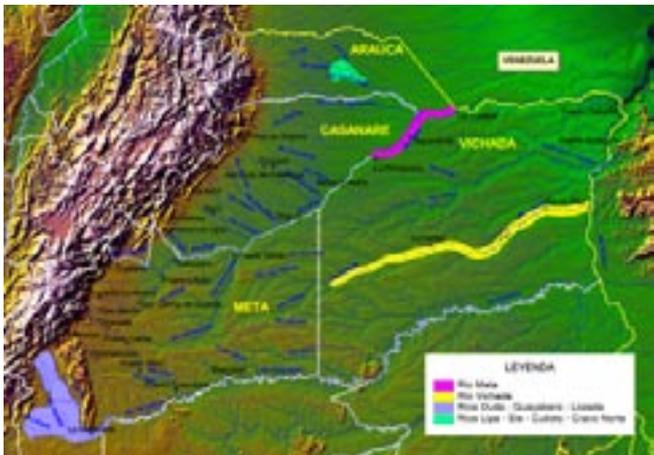


Figure 1. Location of the four relict *C. intermedius* populations in Colombia.

The largest population is found in the Cravo Norte, Cuiloto, Lipa and Ele River basins (central-southern region of Arauca Department), with an estimated population of 54 adults (Ardila *et al.* 2002) and successful reproduction occurring. The second site, La Macarena, in the Duda and Guayabero Rivers (southwestern region of Meta Department), has an estimated population of 25 adults with some successful reproduction (Ministerio de Medio Ambiente 2002). In 2002, Ardila *et al.*

(2005) estimated the presence of 46 crocodiles, 9 observed directly and 3 from footprints (8 adults, 4 subadults), and 34 from interviews with local inhabitants. At the third site, located in the middle of the Meta River between the towns of La Primavera and La Culebra, there were an estimated 15 adults. Finally, a further 15 adults were estimated along the Vichada River in the Vichada Department (Lugo 1998). Since 2002, no new localities for the species have been reported, and these populations’ threatened status seems to have intensified in the past few years. Here, we report on the results of surveys carried out in 2010 and 2011, indicating new locality records for *C. intermedius*.

On 9 December 2010 (1330 h), during a survey in the Vichada River, between Puerto Guipane (6 km from the town of Cumaribo) and Santa Rita (Vichada Department), we sighted a 3-3.5 m long Orinoco crocodile, assumed to be a male on the basis of size. Initially, the individual exhibited its cranial platform, snout and eyes at the water’ surface, and was observed from a distance of 70 m for about one minute, after which it dived under water. The crocodile appeared to respond to sounds being made against the hull of the boat (hitting with a fist and moving an empty barrel) by surfacing and diving twice. The last time it surfaced, it exposed its head and entire dorsal area out of the water, and then returned to its initial position where only the head was visible. Afterwards, with its snout pointing towards the middle of the river and its body perpendicular to the bank, it displayed its entire dorsal surface again, while also lifting its head and tail out of the water in an arched position, and then moving it from side to side violently. At that point the individual lifted its head even further out of the water with its mouth open, which it violently snapped shut twice, producing two clearly audible jawclaps. Immediately after, it produced a short roar, just before hitting its head against the surface of the water (headslap).

It continued, with its head at the water surface, expelling air through its mouth to create bubbles and finally returned to its original position with the dorsal part of its head out of the water before diving once again. This behavior is similar, with some differences, to that described by Medem (1981), Thorbjarnarson and Hernández (1993), Colvée (1999) and Antelo (2008) for captive *C. intermedius* in Colombia and Venezuela. This is the first territorial behavior pattern described for the species in the wild in Colombia.



Figure 1. Orinoco crocodile (2.4 m TL) sighted on 21 February 2011.

On 10 December 2010 (1640 h), during our return trip upstream, this crocodile was observed again at the same spot. It again responded to the sounds we made against the hull of the boat, displaying only its head above the water surface. We slammed a flat piece of wood against the water, trying to imitate the sound of another individual hitting its heads against the water surface. The individual responded by lifting its head slightly and gently opening its mouth three times.

On 9 December 2010 (1520 h), we found fresh tracks from a different crocodile 10 km downstream from where we had observed the first individual. The tracks were discovered on a sandbank at a bend in the river that connected to a small pool. The crocodile was estimated to be over 2.5 m long based on the size of the tracks. On 10 December 2010 we found tracks of a crocodile on another section of the same sandbank, indicating the animal had crossed from a lagoon to the river.

The 2010 expedition, which covered 660 km of the Vichada River, revealed the presence of two *C. intermedius* (one individual on two separate occasions and the tracks of another), both within a 20 km section of the river.

On 21 February 2011 (1740 h), an Orinoco crocodile of approximately 2.4 m length was observed at the same location where the 3.0-3.5 m specimen was sighted in December 2010. The crocodile was possibly a female, as she was near the location of a poached nest (see later). The crocodile traveled gently upstream along the left bank of the river, displaying the top of its head and at times the entire dorsal surface of its body and tail. We also found a crocodile track on the dry sandbank on the right bank of the river, which was revealed due to the low water levels. It is possible that this track was from the larger crocodile observed previously.

According to a local inhabitant's account, a nest was found on this beach on 28 December 2010. The 41 eggs in the nest were removed by locals. The nest was located at the front of the beach slope, about 200 m from the closest line of vegetation (right margin) and about 2.5 m above water level, very close to where we had found the tracks.

On 22 February 2011 (0005 h), we again observed the crocodile at the same location. It responded to our calls, which imitated a neonate's distress call. The individual surfaced and exposed its cranial platform, eyes and nostrils above the water surface. It was dazzled by the 500 lumen flashlight, which permitted us to get the boat to within 1.5 m. We were thus able to better estimate the size of its head before it sunk back into the water. At 0806 h that same morning, the crocodile was observed moving upstream along the left bank of the river, and at 0820 h swimming back down the same path. The movements of this individual could have been associated with nest care and surveillance behaviours (see above), even though it did not approach or demonstrate any aggressive or intimidating behaviours towards the researchers. Although the nest no longer contained any eggs, there are examples of females continuing to watch over nests after the eggs have been removed (Colvée 1999; Antelo 2008).

The individual observed in December 2010 was not sighted in the February 2011 survey, nor were any other *C. intermedius* observed along the 250-km stretch of the Vichada River surveyed at that time; more specifically from the area known as El Retorno, approximately 20 km upstream from Puerto Güipane (Cumaribo) to Cejal, about 230 km downstream from the same port. Over 525 km were traveled during 6 days of expedition.

We are not aware of any records of *C. intermedius* in this part of the Vichada River, although local inhabitants provided information that permitted us to estimate that there were perhaps 7 adults in the stretch between Cumaribo and the mouth of the river (Lugo 1998). Previously reported individuals (Rodríguez 2002) were located over 130 km upstream from the point where we observed our specimens, between the Muco River and the La Raya community.

These results, combined with the information obtained from local inhabitants, who seem not to have seen any hatchlings or juveniles in the last few years, indicate that the number of *C. intermedius* in this remaining population is not recovering and that crocodiles are very dispersed along the course of the river and possibly in associated lagoons and adjacent pools. Further research is needed to confirm the current conservation status of this crocodile population.

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Antonio Castro (*Asociación Chelonia-Colombia, calle 19A No 88-24, Apto. 401 Torre 2, Edif. Santa María de Hayuelos, Bogotá D.C., Colombia*); Manuel Merchan (*Asociación Chelonia-International, Aristóteles, 3, 28027 Madrid, Spain, chelonia@chelonia.es*); Fernando Gomez (*Asociación Chelonia-International*); Mario Garces; and, Miguel Cardenas (*Asociación Chelonia-Colombia*).

South Asia and Iran

India

FIRST RECORD OF GHARIAL NEST HATCHING IN YAMUNA RIVER, UTTAR PRADESH, INDIA. The National Chambal Sanctuary is known to be the only major breeding population for Gharial (*Gavialis gangeticus*) in India. Surveys undertaken in the 1970s revealed breeding populations in the Chambal, Katerniaghat and Chitwan, and the Ramganga and Son Rivers confirmed breeding populations post-restocking (Stevenson and Whitaker 2010). Restocking has generally failed to establish viable Gharial populations in any new locations. The Chambal River has by far the largest subpopulation of wild breeding Gharial, with around 48% of the total population (IUCN 2011).

In 2007, 77 nests were found within the Chambal Sanctuary while 24 were found in Katerniaghat Wildlife Sanctuary (Rao 2007). In 2006, 2007 and 2008 two nests were located in the Son River Sanctuary (Andrews 2006; R.K. Sharma, pers. comm.). Recent reports confirm that stray animals may persist in the upper Brahmaputra River.

On 2 June 2011, a Society for Conservation of Nature volunteer (Munendra) observed a female Gharial carrying hatchlings in her mouth and releasing them into the water. She repeated this several times, by which time around 46 hatchlings had been transported to the water. The female remained at the site, guarding the hatchlings (Fig. 1), as has been observed in other crocodylians.



Figure 1. Hatchling Gharials resting on adult female.

The area where these events were recorded was part of the National Chambal Sanctuary, and specifically 12 km away from the Yamuna and Chambal confluence in the upstream Yamuna River (26° 30.799 N, 79° 14.897 E). The open sand bar on which the nest was located is around 100 m long and 3 m in height, and the sand is finer than Chambal sand. The nest was situated as high as 1.5 m and 2 m away from the water surface/edge. Our literature search indicated that this is the first record of Gharial nesting in the Yamuna River.

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