Crocodile Specialist Group, Species Survival Commission

CROCODILES

Proceedings of the 21st Working Meeting of the Crocodile Specialist Group Manila, Philippines, 22-25 May 2012

(Unreviewed)

2012

IUCN

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convened at Manila, Philippines, 22-25 May 2012

Dedicated to the late Charles "Andy" Ross (1953-2011)

(Unreviewed)

International Union for Conservation of Nature (IUCN)
Rue Mauverney 28, CH-1196, Gland, Switzerland

2012

Front cover: Philippine Crocodile, *Crocodylus mindorensis*. © Crocodylus Porosus Philippines Inc.

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Literature citations should read as follows:

For individual articles:

[Authors]. (2012). [Article title]. Pp. [page numbers] *in* Crocodiles. Proceedings of the 21st Working Meeting of the IUCN-SSC Crocodile Specialist Group. IUCN: Gland, Switzerland.

For the volume:

Crocodile Specialist Group (2012). Crocodiles. Proceedings of the 21st Working Meeting of the IUCN-SSC Crocodile Specialist Group. IUCN: Gland, Switzerland.

New Data on the Conservation Status of the Orinoco Crocodile (*Crocodylus intermedius*) in Colombia

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Abstract

The critically endangered and endemic Orinoco Crocodile (*Crocodylus intermedius* Graves, 1819) was historically found in the majority of the main rivers of the Orinoco basin. At present, only four relict populations exist in Colombia. From 2010 to 2012, three of these populations were surveyed to update information on conservation status. Other areas where information indicated the potential presence of the species were also prospected. At the same time, areas within the species' historic distribution range were evaluated as potential places for reintroduction. More than 3500 km were traveled by boat, covering stretches of 1258 km in several rivers of the Arauca, Casanare and Vichada Departments in Colombia. Flights were carried out in 2010 in the Meta River basin. This study provides new information about localities, population structure, behavior and threats that inhibit the recovery of the species in the wild.

Introduction

The Orinoco Crocodile (*Crocodylus intermedius*) is the only crocodilian 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 the Environmental Ministry of Colombia (Resolution No 383 on February 23rd 2010). From the beginning of 2010 to the present, the Asociación Chelonia and the Corporación Autónoma Regional de la Orinoquia (Corporinoquia) have been carrying out a project in the Departments of Arauca, Casanare and Vichada to support the conservation of the species in Colombia (Merchán *et al*. 2012), as a complement of other conservation initiatives, framed within the National Program for the Conservation of the Orinoco Crocodile, formulated by the Ministry of Environment of Colombia in 1998.

The intense hunting carried out between 1930 and 1960 in the Llanos of Colombia and Venezuela driven by the commercial trade for its skin nearly led to the species' extinction. In Colombia, at least 252,300-254,000 skins were traded during the hunting period (Medem 1981). At the beginning of the hunting period, 850,000 skins were exported from Venezuela in four years (Medem 1983). Subsequently, Thorbjarnarson (1987) and Antelo (2008) estimated that the Orinoco Crocodile population reached, respectively, at least 2 and 3 million specimens in the Llanos region before 1930.

At present, the Colombian populations of the species are restricted to four specific areas (Fig. 1): 1. the central-southern region of Arauca Department (Cravo Norte, Ele, Lipa and Cuiloto Rivers); 2. the medium course of the Meta River; 3. the Vichada River; and, 4. the southwestern region of Meta Department (Guayabero and Duda Rivers) (Ministerio del Medio Ambiente 2002). Some solitary individuals have been reported in other watercourses outside the mentioned areas.

Methods

From the beginning of 2010 until the present, diurnal and nocturnal surveys were carried out in numerous watercourses of the Arauca, Casanare and Vichada Departments (Table 1), mainly during the low water level season (from November to April). These surveys were carried out to update information on the conservation status of the species and to evaluate the conditions of potential reintroduction habitat areas. Several transport means were used for the sampling activities, meanly metallic and fiber glass hull boats with outboard engines and, less frequently, horses, kayaks and wooden canoe-style boats, 4x4 vehicles, and foot travel. Furthermore, several aerial itineraries were carried out in the medium course of the Meta River and tributaries with two types of aircraft ("trike" and "air cam"), which allows flights at low altitude and slow speed. Global positioning devices were used to obtain the geographical references for the individuals and tracks registered.

Sandy beaches, riverbanks and water surface were prospected during the diurnal surveys to look for individuals and trails, which were always led by one or more local inhabitants who were familiar with the area. Stops were made to interview riverine inhabitants or fishermen to obtain present or past information about the species. The estimated total length of the individuals was compared to the track measures when possible.

Nocturnal surveys were carried out using 1,000,000 and 2,000,000 cd spotlights and long range flashlights. Because the presence of insurgent groups complicated the security situation in some of the survey areas, it was not possible to carry out spotlight surveys in some watercourses.

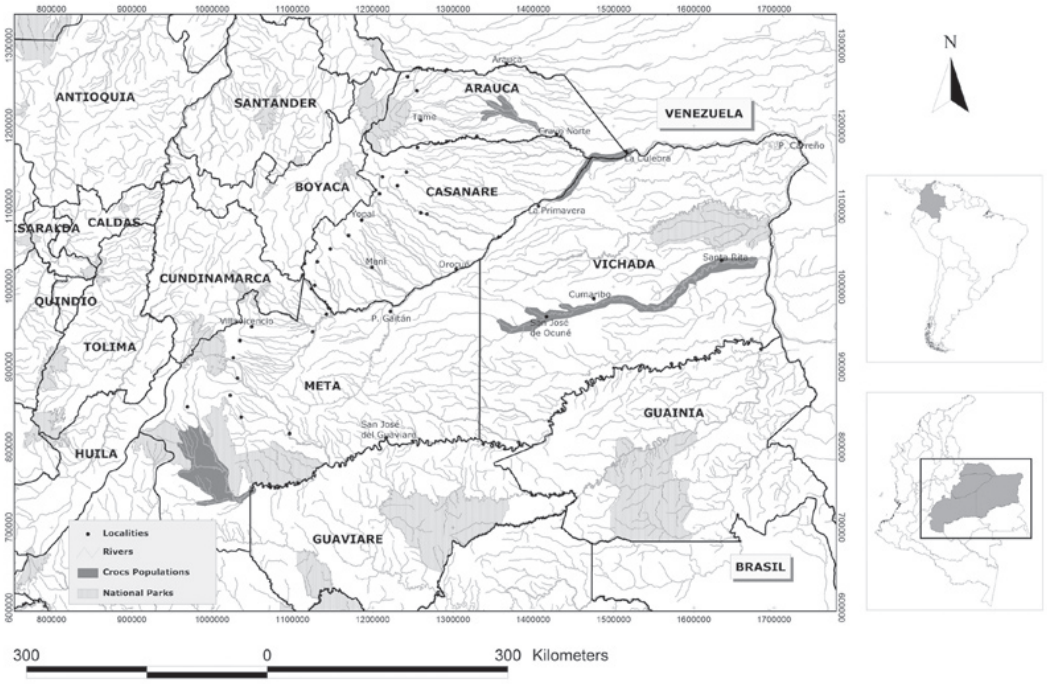

Figure 1. Location of the four relict populations of *C. intermedius* in Colombia (dark grey).

Table 1. Watercourses surveyed in the Arauca, Casanare and Vichada Departments (Colombia).

Sub-Basin	River/Creek	Total Dist. (km)	Stretch Dist. (km)	Spotlight Survey (km)	Visits	Months
Meta	Cravo Sur	116.4	31.4	7.3	3	Aug/Sep/Nov 10
	Güira	7.5	7.5	-	2	Sep/Nov 10
	Caimán	4.8	2.4	-	1	Sep 10
	Güirripa	Spot	Spot	-	1	Sep 10
	Canacabare	24.0	12.0	12.0	1	Nov 10
	Meta	1353.0	322.0	135.0	5	Aug/Nov/Dec 10/Mar 11/Feb 12
	Duya	8.7	8.7	-	1	Aug 10
	Guanapalo	89.6	44.8	44.8	1	Nov 10
	Gandul	14.3	7.2	7.2	1	Nov 10
	Yatea	Spot	Spot	-	1	Nov 10
	Guachiría	36.0	18.0	-	1	Nov 10
	La Hermosa	80.4	40.2	40.2	1	Nov 10
	Picapico	37.0	18.2	18.2	1	Feb 12
	Aguasclaras	28.4	14.2	14.2	1	Feb 12
	Ariporo	31.6	26.8	-	2	Oct 10/Feb 11
	Chire Nuevo	Spot	Spot	-	2	Oct 10/Feb 11
	El Toro	7.0	3.5	-	1	Oct 10
	El Indio	4.0	2.0	-	1	Oct 10
Cravo Norte-Ele-Lipa	Cravo Norte	254.0	127.0		1	Apr 12
	Ele	88.0	44.0	14.2	1	Apr 12
	Lipa	28.0	14.0	19.5	1	Apr 12
Casanare	Casanare	164.0	82.0	76.0	1	Feb 12
Vichada	Vichada	1234.0	402.0	52.0	2	Dec 10/Feb 11
Orinoco	Orinoco	57.7	30.5	-	1	Mar 11
Dagua-Mesetas	Dagua	Spot	Spot	-	1	Mar 11
	Mesetas	Spot	Spot	-	1	Mar 11
Total		3668.4	1258.4	440.6		

Results

Arauca Population

Between 9 and 12 April 2012, 185 km of river in the central-southern region of the Arauca Department (14 km of the Lipa River, 44 km of Ele River and 127 km of Cravo Norte River) were surveyed by boat during the day and at night to detect the presence of Orinoco Crocodiles and their tracks on beaches and riverbanks. Thirty specimens were observed and 5 nests were visually identified (Tables 2 and 3). Also, 4 nests were noted from information provided by local inhabitants (two were flooded and two were destroyed by humans). Because of the rapid increase in water levels this year, 3 nests were totally flooded (two were referenced and one was verified) and another one was partially flooded. In the latter case the nest was found 2.5 m away from the shore of the river, although the water had penetrated the nest from the bottom. From this nest 12 hatchlings were produced, 12 eggs had not yet hatched and 16 eggs and hatchlings were lost. This nest was watched by two local inhabitants who told us that it was laid on 10 January; the eggs hatched 91 days later on 12 April. The other 4 nests identified seemed to hatch successfully according to the information received, although we could not locate the hatchlings near the nest area. The same information source noted that 42 hatchlings hatched from one of these nests.

Table 2. Location of nests and hatching success.

Nest	River	Coordinates		Hatching Success
1	Cravo Norte	N 06º 31'42.1"	W 70º 48'39.2"	Successful
2	Cravo Norte	N 06º 27'59.3"	W 70º 37'22.1"	Successful
3	Cravo Norte	N 06º 23'33.0"	W 70º 25'43.4"	Partially successful
4	Cravo Norte	N 06º 23'24.2"	W 70º 25'57.3"	Successful
5	Cravo Norte	N 06º 23'24.2"	W 70º 25'57.3"	Flooded (same beach as Nest 4)

Ardila *et al*. (2002) detected 11 nests in 2001 (two of them just "potential"): 6 in the Ele River and 5 in the Cravo Norte River. The 5 nests detected by Asociación Chelonia were located in the Cravo Norte River. Nest 4 and 5 (Table 2) were found on the same beach, 2.5 m from each other. The nests detected by Asociación Chelonia do not geographically coincide with any of the nests detected in 2001 (although the 2001 locations were not detailed precisely in the publication, only plotted in a detailed map) (Fig. 2).

The specimens registered in 2012 were: 3 adult (estimated TL >2.5 m) and one sub-adult crocodiles in the Lipa River (0.28 ind./km); 7 adults and 2 sub-adults in the Ele River (0.2 ind./km); 8 adults and 9 sub-adults in the Cravo Norte River (0.13 ind./km) (Table 3; Fig. 3). The majority of the specimens were located during the day. Because of the highly problematic security situation in the area, only 19.5 km were surveyed at night in the Ele River and 14.2 in the Lipa River.

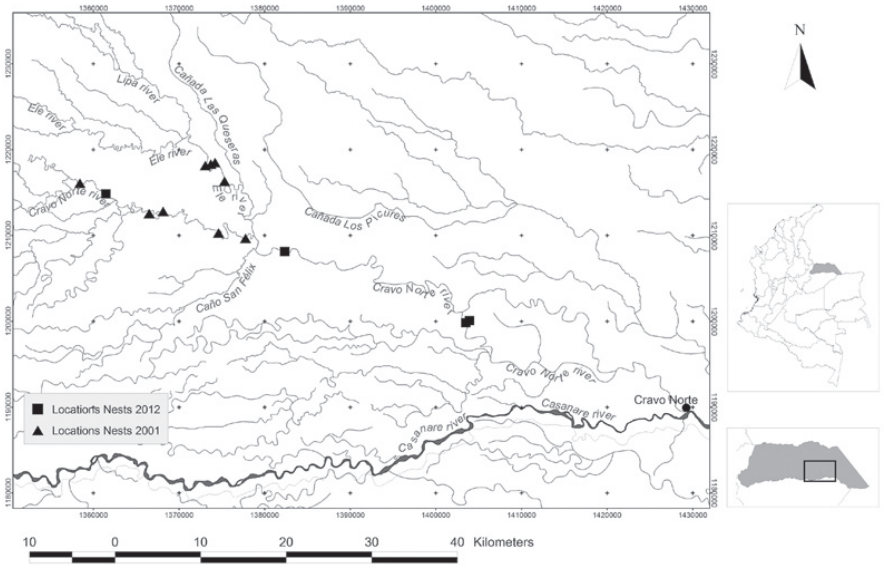

Figure 2. Locations of Orinoco Crocodile nests detected in 2001 and 2012 in the Cravo Norte-Ele-Lipa River system (Arauca Department).

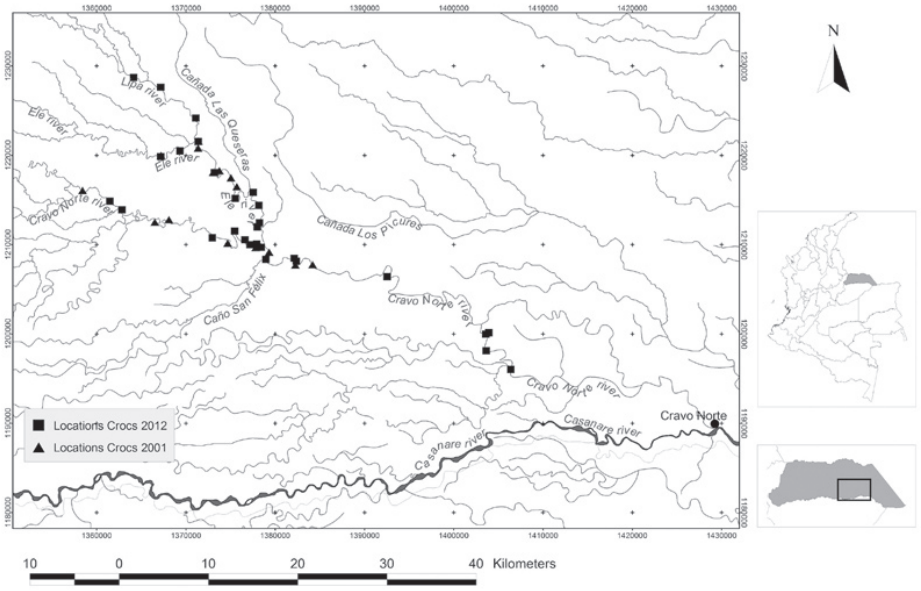

Figure 3. Locations where Orinoco Crocodiles were observed in 2001 and 2012 in the Cravo Norte-Ele-Lipa River system (Arauca Department).

Table 3. Details of Orinoco Crocodiles detected in the Cravo Norte-Ele-Lipa River system (Arauca Department). TL= total length.

Nest	Date	River	Detection	Est. TL (m)	Coordinates
L1	Apr 12	Lipa	Visual	4.5	N 06°35'17.30", W 70°43'16.20"
L2	Apr 12	Lipa	Visual	2	N 06°36'42.90", W 70°43'24.70"
L3	Apr 12	Lipa	Visual	2.6	N 06°38'35.70", W 70°45'31.30"
L4	Apr 12	Lipa	Visual	4	N 06°39'12.01", W 70°47'10.40"
E1	Apr 12	Ele	Visual	3	N 06°34'43.50", W70°44'22.80"
E2	Apr 12	Ele	Visual	3	N 06°34'23.10", W 70°45'33.30"
E3	Apr 12	Ele	Visual	3	N 06°31'49.20", W 70°41'02.90"
E4	Apr 12	Ele	Visual	4	N 06°32'10.80", W 70°39'57.80"
E5	Apr 12	Ele	Visual	1	N 06°33'23.50", W 70°42'17.80"
E6	Apr 12	Ele	Visual	2.8	N 06°31'23.40", W 70°39'37.10"
E7	Apr 12	Ele	Visual	1	N 06°31'23.40", W 70°39'37.10"
E8	Apr 12	Ele	Visual	3.3	N 06°30'19.90", W 70°39'35.20"
E9	Apr 12	Ele	Visual	3.5	N 06°30'05.30", W 70°39'43.50"
C1	Apr 12	Cravo Norte	Visual	0.5	N 06°28'50.50", W 70°39'30.10"
C2	Apr 12	Cravo Norte	Visual	4	N 06°29'18.40", W 70°40'28.70"
C3	Apr 12	Cravo Norte	Visual	1.5	N 06°29'50.40", W 70°41'05.80"
C4	Apr 12	Cravo Norte	Visual	4.5	N 06°29'26.70", W 70°42'27.80"
C5	Apr 12	Cravo Norte	Visual	4	N 06°31'10.70", W 70°47'55.50"
C6	Apr 12	Cravo Norte	Visual	4.5	N 06°31'42.10", W 70°48'39.20"
C7	Apr 12	Cravo Norte	Visual	2.7	N 06°29'00.60", W 70°40'10.80"
C8	Apr 12	Cravo Norte	Visual	2	N 06°29'02.00", W 70°39'46.00"
C9	Apr 12	Cravo Norte	Visual	1	N 06°28'06.20", W 70°39'12.90"
C10	Apr 12	Cravo Norte	Visual	2	N 06°28'09.60", W 70°37'30.10"
C11	Apr 12	Cravo Norte	Visual	3	N 06°27'59.28", W 70°37'22.08"
C12	Apr 12	Cravo Norte	Visual	1.5	N 06°27'00.60", W70°31'52.00"
C13	Apr 12	Cravo Norte	Visual	3.6	N 06°27'00.04", W70°31'51.38"
C14	Apr 12	Cravo Norte	Visual	3	N 06°23'34.34", W70°25'44.00"
C15	Apr 12	Cravo Norte	Visual	1	N 06°23'29.03", W 70°25'54.60"
C16	Apr 12	Cravo Norte	Visual	2	N 06°22'28.70", W 70°25'53.60"
C17	Apr 12	Cravo Norte	Visual	1	N 06°21'19.60", W 70°24'24.60"

Lugo and Ardila (1998) estimated an Orinoco Crocodile population of 50 adults for this region, having also surveyed a short stretch of the Cuiloto River. Ardila *et al*. (2002) estimated a population of 54 individuals for the same area. A comparison of the specimens, eggs and/or nests detected in the last 3 surveys, with available data, is shown in Table 4 and Figure 4.

The higher relative density registered in 2001 seems to be due to the concentration of the survey in the stretches of the Cravo Norte and Ele Rivers where the major part of the individuals seem to inhabit (the zone located between the confluence of the Ele and Lipa Rivers and the confluence of the Cravo Norte and Ele Rivers). Out of this core area, upstream and downstream, the relative density seems to be lower.

Table 4. Numbers of Orinoco Crocodiles, eggs and nests detected in the Arauca population in 1995 (Lugo and Ardila 1998), 2001 (Ardila *et al*. 2002) and 2012 (Chelonia). Hatchlings: numbers in brackets correspond to number of nests where hatchlings came from. Eggs: numbers in brackets corresponds to number of nests where eggs came from. Nests: negative numbers correspond to number of nests predated by humans; p: potential beach for nesting; f: flooded nest; r: nest referenced by local inhabitants.

River	Year	km	Adults	Sub-adults	ind/km	Hatchlings	Eggs	Nests
Cravo Norte River	1995	100	10	2	0.12	2	-	-
Ele River	1995	73	12	-	0.16	-	-	-
Lipa River	1995	10	1	-	0.10	-	-	-
Cuiloto River	1995	20	4	-	0.20	32	-	-
Total	1995	203	27	2	0.14	34	-	-
Cravo Norte River	2001	60	8	2	0.16	-	-	4 +1p
Ele River	2001	30	11	2	0.43	120 (4)	126 (3)	5 +1p
Lipa River	2001	10	1	0	0.10	-	-	-
Total	2001	100	20	4	0.24	120	126 (3)	11 (-7)
Cravo Norte River	2012	127	8	9	0.13	54 (2)	82 (2)	5 (-2f)
Ele River	2012	44	7	2	0.20	-	-	4 (-2r)
Lipa River	2012	14	3	1	0.28	-		
Total	2012	185	18	12	0.16	54	82	9 (-4)

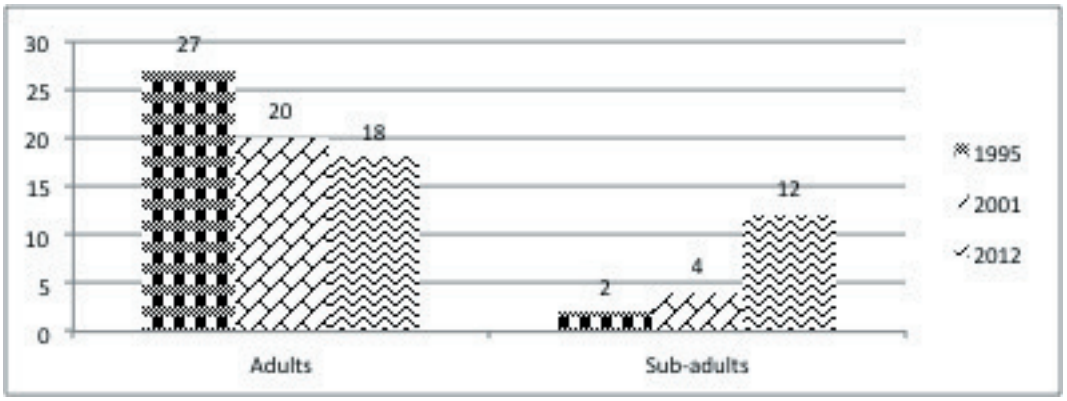

Figure 4. Numbers of adult and sub-adult Orinoco Crocodiles detected in the Arauca population in the dry season of 1995, 2001 and 2012.

One Orinoco Crocodile skull (62 cm long) was found on a property within the area. On the basis of head size we estimate that the individual was an adult of approximately 3.72 m length. The skull presented a hole on the right side of the snout, 30 cm from the anterior extreme, which seems to have been made by a bullet. According to the local inhabitants, this specimen was very emaciated when it was seen a few weeks before it was found dead, so we can assume that the shot prevented the animal from feeding, eventually causing its death. We also received information about the killing in January of other adult specimen. In March, another source informed us about the killing of 3 adults because they had fed on cattle, but we could not verify if they were the same individuals as the other two mentioned.

Vichada River Population

A stretch of 402 km of the Vichada River was surveyed in December 2010 and February 2011, from the place known as El Retorno (20 km upstream from the port of Cumaribo) to Santa Rita. Two specimens were visually detected (Fig. 5) in the same spot of the river (Pozo Caimán) - one in December and another in February (Table 5). Another specimen was detected by its tracks on the beach El Cejal located 10 km downstream from Pozo Caimán (Castro *et al*. 2011a,b) (Fig. 6).

Table 5. Details on Orinoco Crocodiles.

Crocodile	Date	River	Detection	Estimated Size (m)	Coordinates
V1	Dec 10	Vichada	Visual	3-3.5	N 04°31'43.5", W 68°53'19.1"
V2	Feb 11	Vichada	Visual	2.4	N 04°31'43.5", W 68°53'19.1"
V3	Dec 10	Vichada	Trail	>2.5	N 04°32'31.7", W 68°50'13.9"

The specimen observed in December seemed to respond to noises made from the boat. According to our guide's indications, we made a noise hitting the hull of the boat for about two minutes. The crocodile emerged on the inner side of the meander, showing only its nostrils, eyes and skull roof. After submerging and emerging three times, the specimen displayed a territoriality behavior with its snout pointing towards the center of the river and almost perpendicular to the shore. The behavior consisted in showing the entire dorsal surface of the head, body and tail, coming about two meters closer to the boat. Then, it simultaneously raised its head and tail in an arched position and made a violent lateral movement with the tail. The head tilt became more pronounced, with an open mouth that later closed violently two times, producing two audible snaps. Posteriorly it produced a grunt and slapped its jaw against the surface of the water, followed by the expulsion of air from the mouth and producing bubbles before it submerged back into the water. This behavior is almost the same, with some variations, as that described by Medem (1981), Thorbjarnarson and Hernández (1993), Colvée (1999) and Antelo (2008) for males in captivity in Colombia and Venezuela.

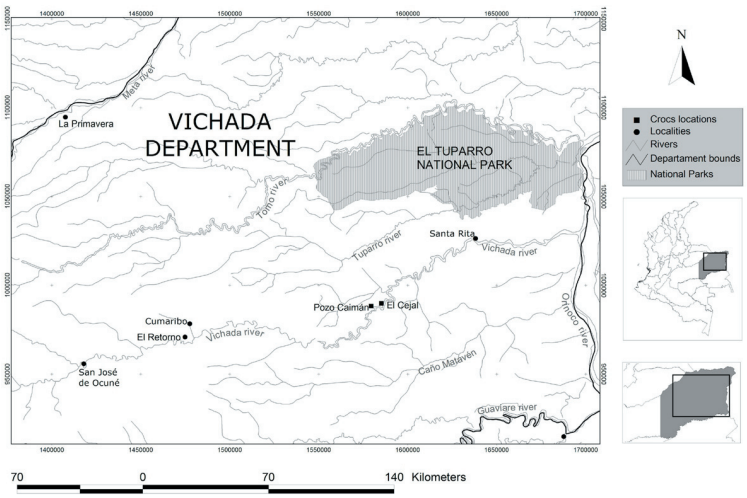

Figure 6. Locations (Pozo Caimán and El Cejal) in the Vichada River where specimens were detected .

Figure 5. Orinoco Crocodile observed in Pozo Caimán, Vichada River (Vichada Department) in February 2011.

We were informed by a local inhabitant that a female nested on 28 December 2010. The nest contained, according to the same source, 41 eggs, which did not hatch. This nest seems to be the only one identified in this stretch of the river. As local people know its location, the eggs are collected for consumption year after year. The information collected in the area indicates that, in at least the last three years, no hatchling or juvenile has been observed by local inhabitants in this stretch (Merchán *et al*. 2012).

The specimen detected in February was observed several times at different hours over two days; although a trail on the beach of the meander was detected, the specimen was not observed out of the water. No other specimen was detected in the area during this survey. Because of the exhibited behavior, size and proximity to the site nest, we suppose that it could be a female, but do not have enough information to be certain.

Lugo and Ardila (1998) estimated seven adult Orinoco Crocodiles in the stretch, from the locality of Cumaribo to the mouth of the river, based on information provided by local inhabitants in 1996, and registered the presence of four hatchlings in a 50-km stretch between Cumaribo and La Raya in 1995.

Middle Course of the Meta River Population

A total stretch of 322 km along the middle course of the Meta River was surveyed on five occasions (August, November and December 2010, March 2011 and February 2012) from the mouth of the Cravo Sur River to the locality of La Culebra (Vichada). Stretches of several tributaries (236.9 km) of the Meta River were also surveyed (Table 1). No Orinoco Crocodiles or tracks were detected in the stretches of the rivers and creeks traveled during these visits. The width of the Meta River and the presence of several branches with sand islands increase the area to be surveyed.

Most of the information collected from local populations, riverine inhabitants and fishermen indicates that the probability of the species' presence is higher from the area known as La Vorágine and downstream the river. Here, some riverine inhabitants indicate the occurrence of two or three specimens. Another specimen is mentioned in the place known as La Constancia, 42 km downstream from La Vorágine (Fig. 7).

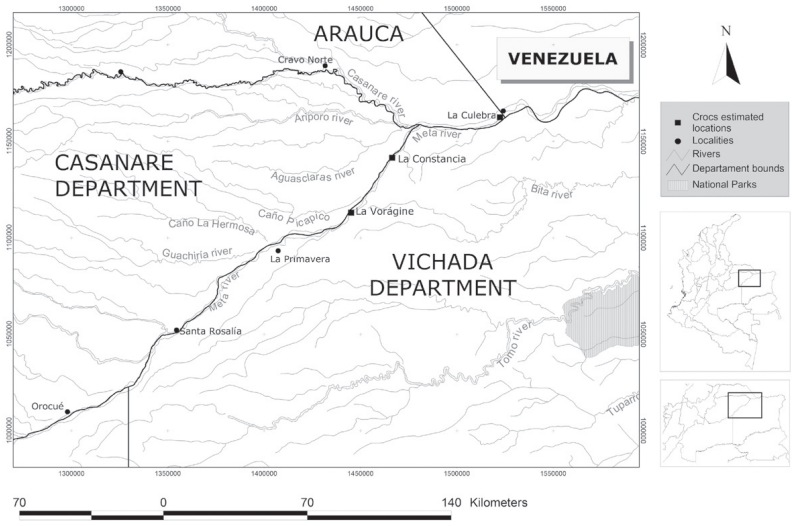

Figure 7. Locations where Orinoco Crocodiles are detected in the Meta River.

Nesting does not seem to have been detected by local inhabitants in the last two years. Although there is information about a nesting beach in the area of La Vorágine dating before 2010, the source indicated that the eggs were collected for consumption every year, so there has not been evidence of hatchlings or juveniles in the area in the last few years.

Lugo and Ardila (1998) estimated the presence of 15 adults in the stretch of the Meta River between La Primavera and La Culebra based on information from local populations. She also recorded one juvenile in La Vorágine in 1994. Additionally, from the information collected, the author indicated the presence of nests, hatchlings and juveniles for that year.

Discussion

Arauca Population

Thirty specimens (18 adults and 12 sub-adults) were observed in 185 km (0.16 ind./km) of the Cravo Norte-Ele-Lipa River system (Arauca Department). The relative density of individuals is similar to the density reported by Lugo and Ardila (1998), although the distance traveled in 1995-1996 was slightly higher, including part of the Cuiloto River.

The killing of adult specimens due to local inhabitants' and cattle ranchers' fear and the supposed predation on cattle could be reducing the number of adult crocodiles in the wild. This seems to be decreasing the number of adults in this population, while the number of sub-adults seems to be increasing.

The total number of nests (referenced and detected) in 2012 is close to the number cited by Ardila *et al*. (2002) from the 11 nests detected in 2001. Our data implies the presence of at least 9 reproductive females in the surveyed area. In 2012, at least two nests (referenced by local inhabitants) were preyed upon humans for consumption. Another two nests were

totally flooded, one was partially inundated because of this year's fast water level rise, and four are estimated to have hatched successfully. There was no information about the flooding of Orinoco Crocodile nests in this area before, so we likely need to take into account the possibility that aspects related to climate change and the alteration of the hydrological dynamics of the river system could play an important role on the recovery of the Orinoco Crocodile populations now and in the next few years.

Analyzing the data obtained, and comparing it with past surveys, this population seems to maintain its viability, despite the killing of adult specimens and the harvest of some nests. The number of individuals seems to have been maintained over the last fifteen years, with a possible variation in the population structure (age classes).

This population could be considered the most well conserved in Colombia. Also, several threatened species coexist with the Orinoco Crocodile in the area, so it would be highly recommendable to promote the creation of a protected area to effectively protect the crocodile population and the ecosystems necessary for their survival.

In the Arauca department other areas exist where the species has been reported by the local population. One of these areas is the eastern region of the department, adjacent to the Venezuelan border, where the species seems to be present, but specimens could not be recorded by investigators who visited the sector (Luis F. Anzola, pers. comm.). In this area the Capanaparo and Cinaruco Rivers are born before flowing into Venezuelan territory. These two watercourses are home to an important Orinoco Crocodile population in Venezuela, within the Santos Luzardo National Park, where reintroductions have been implemented during the last two decades. In the Capanaparo river 1264 Orinoco crocodiles were reintroduced since 1991, while in the Cinaruco River 396 have been released since 2001 (Omar Hernández, pers. comm.).The conservation status of the area, the low density of the human population and the region's isolation are features to consider regarding the possibility of establishing a bi-national protected area where reintroductions could be implemented in the future.

Vichada River Population

Lugo and Ardila (1998) estimated this population of no more than 15 adult specimens very dispersed along the course of the river (about 500 km), including the presence of reproductive events and hatchlings. The Asociación Chelonia team observed only two individuals (402-km stretch): one male and one individual (sex not determined). Another individual was noted through the detection of several trails on a beach. All of the specimens were concentrated in a stretch of 10 km. A nest was reported in this area by local inhabitants who are familiar with the location and the female's fidelity to the specific site. No hatchlings or juveniles had been seen at least during the last three years in the stretch of the river surveyed.

The Vichada River is located in an isolated area, with a very low density of human inhabitants. It is considered, in its eastern part, a limit between the high-plain savannas of the Llanos region and the transitional forest that forms an ecotone between the Orinoquia and the Amazonia, with the presence of some areas of the Guiana shield. A large part of its right margin is the northern limit of the widespread indigenous reserve of "Selva de Matavén", with little indigenous communities found along its course. Furthermore, the ecosystems of the area are well-conserved and anthropic influence is small. Boat traffic is low and the majority is from small boats and canoes among the riverine communities and to the capital of the department, Cumaribo. There is more intense fishing activity during the dry season, but generally low impact devices (hooks, bow and arrow) are used, so that the probability of accidental death by drowning in fishing nets seems to be very small.

The low number of reproductive events, the practice of egg harvest for human consumption and the low density of crocodiles seems to have prevented the natural recovery of this population, despite the low human pressure. We estimate that the natural recovery of this population at present is not possible, so that effective protection measures should be carried out, preferable with an active participation of the local communities.

The planning of large agriculture and forestry projects in the high plain of the Vichada Department during the next few years could increase the human pressure on the areas near the Orinoco Crocodile population's range.

Middle Course of the Meta River Population

We consider this population to be the most threatened of the four relict populations in Colombia. The easy access to the area, the transit of boats, fishing pressure and the effects of the transformation of the ecosystems in the higher course of the river constitute important threats for the crocodiles of the Meta River.

In the surveys implemented by the Asociación Chelonia team in the Meta (Table 1), no specimen or tracks were detected. Based on the information provided by fishermen and riverine inhabitants, the crocodile population is estimated as less than 15 dispersed individuals, located along a 110-km stretch between La Vorágine and La Culebra (or Nueva Antioquia). Information provided by riverine inhabitants indicates that before 2010 at least one nest site was known in the area of La Vorágine, but its eggs were collected annually. This reproductive event has not been recorded again since 2010.

Due to these factors, we estimate that the natural recovery of this population is very complicated, keeping in mind the potential increase in human pressure in the area related to the implementation of oil, agriculture and forestry activities.

Acknowledgements

We thank the Corporación Autónoma Regional de la Orinoquia (Corporinoquia, Colombia) for its cooperation and assistance to carry out our fieldwork and other labors in the Casanare, Arauca and Vichada Departments (Colombia). We also thank the Fundación Biodiversidad (Environment Ministry, Spain), Fonds de Dotation pour la Biodiversité - Save Your Logo (http://www.fdbiodiversite.org/fr, France) and the Lacoste Company (France) for supporting the Orinoco Crocodile Conservation Project. We wish to show our gratitude to Dra. Myriam Lugo for the information provided, Rebecca L. Greenberg for the revision of the manuscript, Rafael Antelo and Luis F. Anzola for their collaboration and support in some of the surveys and all the people who helped us in many different ways to the implementation of the project.

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