

# Conservation of the Magdalena River Turtle in the Sinú River, Colombia

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## Background and introduction

The Magdalena River turtle, *Podocnemis lewyana* (Podocnemididae) is endemic to the drainages of the Sinú and Magdalena Rivers in Colombia and the only member of the family Podocnemididae that occurs north-west of the Andes (Páez *et al.* 2009) (Fig. 1). According to the IUCN red list of threatened species, *P. lewyana*'s status is Critically Endangered and is included in the world's 25 most endangered turtles species list (Rhodin *et al.* 2011). Despite its status as Critically Endangered, the known range does not overlap with any protected areas in the country.



Fig. 1. The Magdalena River turtle *Podocnemis lewyana*.

Because it is the largest freshwater turtle of northern Colombia, it is an important source of protein for the inhabitants of both drainages (Castaño-M 1986). Besides being hunted for its meat, it is also pursued for its eggs, which are considered to be delicacies. This turtle's distribution in poor rural areas makes it a good source of income and food for local fishermen (Castaño-M 1986; Gallego-García & Castaño-Mora 2008; Restrepo *et al.* 2008). In addition, along the Sinú River, the third most important river of Colombia, the consumption of turtles during Easter seems to be an obligation rather than a tradition, and this issue increases hunting and illegal trade enormously. Overexploitation is not the only threat to this species: habitat loss is rapidly increasing throughout its range. Ranchers are destroying riparian vegetation and drying wetlands for the establishment of pastures for cattle ranching, disturbing the turtle's habitat, food resources and basking sites (Castaño-M 1986; Gallego-García & Castaño-Mora 2008; Restrepo *et al.* 2008; Correa *et al.* 2010).



Fig. 2. Map showing the course of the Sinú River in Colombia and the location of the study areas on either side.

The current status and future survival of this species in the Sinú River is even more complicated. The river originates in the southern portion of the state of Córdoba and flows north 415km into the Caribbean Sea (Fig. 2). No major tributaries flow into it and it has no connection with the Magdalena River whatsoever. The Sinú River population is completely isolated from all others, and migration of individuals is almost non-existent. Furthermore, in 1990 a hydroelectric dam was built in the upper basin of the river and since then its natural flow has been regulated. Before the dam, the river's flow was low during the dry season, from December to March, and sand beaches appeared marking the onset of the reproductive season. This pattern has changed, and currently beach emergence and the river level are determined by the amount of water released by the dam. During the dry season, flows can be equal to those of the rainy period, flooding all available beaches. The duration and frequency of the floods are very variable and depend on the amount of hydroelectric energy needed, but generally they are frequent enough to inhibit either egg laying, incubation or hatchling emergence.

With no migration and negligible amounts of births, virtually no new individuals have been added to this population. This extremely low recruitment rate, together with high levels of adult exploitation, may drive this population to a dramatic decline in the near future and could even lead to its extinction. To diminish the threats to this species in the Sinú River, a community-based conservation programme was set up in 2006, which includes six different lines of action: (1) *in situ* management, (2) *ex situ* management, (3) monitoring, (4) awareness raising and education, (5) community development and (6) participatory research. All management activities (lines of action 1 and 2) have been focussed on augmenting population recruitment, either by rescuing clutches laid in flood-prone beaches and incubating them *ex situ*, or by increasing nesting site availability by building artificial sandbanks on the riversides where rising flows have no effect.

Maintaining and expanding the work of the community requires a lot of commitment and regular funding. During the year of 2014, activities for the conservation of the species were possible thanks to the contributions of the British Chelonia Group, Turtle Survival Alliance, the Wildlife Conservation Society and Fundación Mario Santodomingo. We present below the results from this year's work.

### **Conservation actions in the Sinú River**

This year, although funding from some supporting parties was reduced compared with previous years, WCS and TSA stepped up to keep the programme afloat. We continued with the artificial beaches at elevated areas protected from floods. For this, riverbanks were first cleaned from vegetation, the slope was reduced to allow turtles to climb and a layer of sand of 30cm

was added, creating a beach with a substrate consisting of a mixture of sand and soil (Fig. 3). Three artificial sand beaches were built in Caño Viejo: La Isla, Caño Viejo and La Ganga and two in the community of Cotocá Arriba: Guamal and Edmundo. All of the beaches were built by people from the community who work in the conservation programme. Forty nests were recorded in the artificial beaches of Caño Viejo and eight in Cotocá Arriba (Table 1). Nests from Caño Viejo were taken to the incubator (Fig. 4) because mortality caused by ants is still high in this community.

Table 1. Nests and eggs in artificial beaches built by the team.

Community	Artificial Beach	No. nests	No. eggs	No.nests incubated in situ
Caño Viejo	La Isla	17	318	0
	Caño Viejo	15	303	0
	La Ganga	8	140	0
Cotocá Arriba	Guamal	6	96	6
	Edmundo	2	39	2
<b>Total</b>		<b>48</b>	<b>896</b>	<b>8</b>

Another big threat to the nests of *P. lewyana* is trampling by cows that go to the river to drink water. To mitigate this impact we closed the access to the beaches Ganga and La Isla using barbed wire. Thanks to this simple management action agreed with the landowners, nine nests were incubated in natural beaches. These nests produced 189 eggs, from which 181 hatchlings were born, for a hatching success of 98.36%.

*Ex situ* management also continued this year thanks to the boat presented by TSA (Fig. 5). During the entire nesting season the beaches occurring between the localities of Lorica and San Nicolas de Bari were searched and those nests that were located in non-protected beaches or in flood-prone areas of protected beaches were transferred to incubators in Caño Viejo. Nests not under any threat were left at the beach and monitored permanently. By the end of the nesting season, we collected 95 nests, resulting in 1825 eggs, from five natural and three artificial beaches. 9.4% of the eggs were infertile and 1585 hatchlings emerged from the fertile eggs for a hatching success of 95.9% (Table 2). If we add to this the nine nests that were left to incubate in situ, there were 1766 hatchlings released this year in Caño Viejo.



Fig. 3a. Artificial beach built to increase nesting site availability for *P. lewyana* at the Sinú River.



Fig. 3b. The finished beach. Photos by Luis C. Negrete.



Fig. 4. Artificial incubation of the eggs of *Podocnemis lewyana*. The incubator is located in a room in Alberto Viga's own house, leader of the community project. Photo by Natalia Gallego.



Fig. 5. Armando and Alberto Viga and relatives with the hatchlings in the boat presented by TSA last year. This boat has allowed them to protect and monitor more beaches and therefore rescue more nests. Photo by Natalia Gallego.

Table 2. Number of nests, eggs and hatchlings incubated *ex situ* in Caño Viejo in 2014.

Beach	No. nests	No. eggs	No. infertile eggs	No. hatchlings	Hatching success
Natural La Ganga	10	197	16	170	93.9%
Natural La Isla	2	45	7	38	100%
Natural Caño Viejo	0	0	0	0	0
Natural El Chorro	10	197	16	170	93.9%
Natural La Peña	33	625	62	552	98.0%
Artificial La Isla	17	318	28	282	97.3%
Artificial Caño Viejo	15	303	20	272	96.1%
Artificial La Ganga	8	140	23	101	86.3%
<b>Total</b>	<b>95</b>	<b>1825</b>	<b>172</b>	<b>1585</b>	<b>95.9%</b>

In the locality of Cotocá Arriba, we monitored three natural beaches, Benito Osorio, Cotocá Arriba and Guamal and transferred all nests found. In this locality, all beaches are flooded so rescuing the nests is mandatory here. We found 26 nests that had 444 eggs from which 12.6% were infertile. Hatching success for this locality in 2014 was 87.5% (Table 3).

Table 3. Number of nests and eggs incubated *ex situ* in Cotocá Arriba in 2014.

Beach	No. nests	No. eggs	No. infertile eggs	No. hatchlings	Hatching success
Natural Guamal	5	74	2	68	94.4%
Artificial Guamal	6	96	18	74	94.9%
Natural Benito	13	235	29	183	88.8%
Artificial Edmundo	2	39	7	14	17.9%
<b>Total</b>	<b>26</b>	<b>444</b>	<b>56</b>	<b>339</b>	<b>87.37</b>



Fig. 6. Release event at the community of Caño Viejo with the participation of local schools, members of other communities, environmental authorities and other NGOs. Photo by German Forero.

On 30 April and 2 May the communities released more than 2000 hatchlings of *P. lewyana*. Each community held an event for this purpose, inviting members of the community and neighbouring communities, school teachers and environmental authorities such as CVS, Conservation International, URRRA S.A. E.S.P, and others (Fig. 6).

Although the budget was constrained this year, the communities with the support of the TSA/WCS team were able to continue with the management activities for this species. Results were outstanding, improving nesting site availability, protecting females and incubating and releasing more than 2000 hatchlings that would have been unviable otherwise due to flooding of natural beaches.

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