FIRST SUCCESSFUL CAPTURE AND SATELLITE TRACKING OF AN ANTILLEAN MANATEE (*Trichechus manatus manatus*) IN PANAMA: PRELIMINARY FINDINGS AND IMPLICATIONS FOR CONSERVATION

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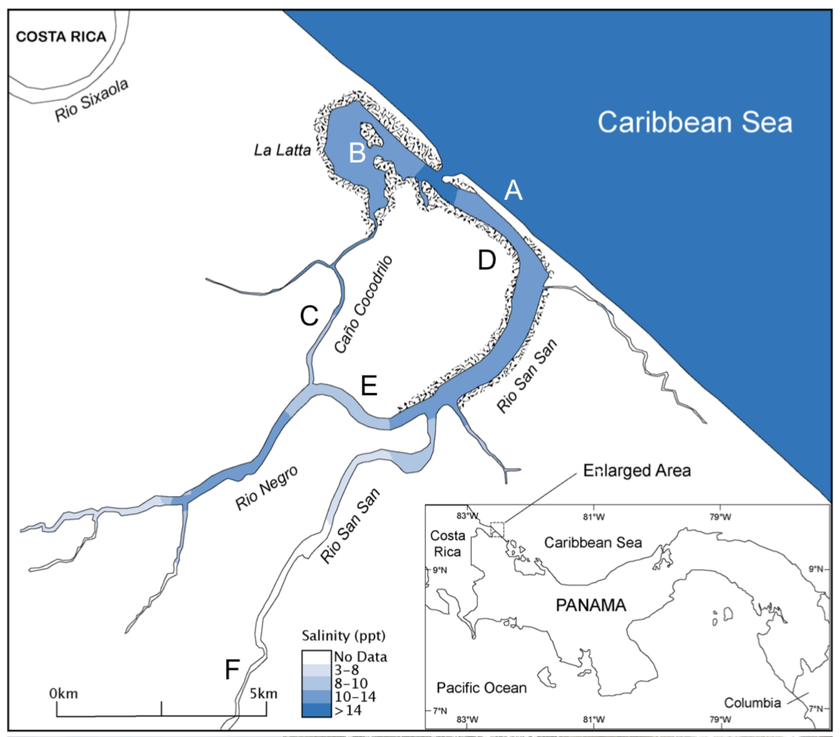
Abstract

Antillean manatees (*Trichechus manatus manatus*) are non-continuously distributed from the southern Gulf of Mexico to northern Brazil. Despite their large geographic range, much remains unknown about their movement patterns, especially in riverine habitats, as most studies have focused on the use of coastal marine areas. One of the reasons for this is that manatees can be cryptic and very difficult to observe and capture in tannin-stained riverine habitats. However, information on movements within and between riverine habitats is needed to better understand and conserve this subspecies because much of their suitable habitat in Central America is composed of non-marine areas. The objectives of this study were 1) to determine if the wetlands of San San Pond Sak (SSPS) in western Panama are an adequate site for manatee capture and tracking studies and 2) to assess movement patterns of manatees within SSPS and adjacent marine areas. We employed capture strategies that took advantage of the ability to bait manatees in the area. On January 31st, 2008, a young female manatee was captured and fitted with a floating Argos/VHF tag via a tether and belt attachment system. A total of 224 locations were obtained over 46 days of tag deployment. All locations were within SSPS, where salinity readings ranged from 3.39-11.93 ppt. Available forage consisted of *Eichornia crassipes*, *Rhizophora mangle*, and shore grasses. We conclude that SSPS is an adequate field site for manatee telemetry studies and that the mangrove environment does not impede the use of the traditional belt, tether and floating tag methodology for tracking manatees in estuarine habitats. Ample forage and freshwater in this river system, combined with protection from hunting since 1994, may allow for high site fidelity within this riverine system and little interchange with adjacent populations.

Introduction – Capture Methods

Fig. 1. Capture methods used in **A)** San San Pond Sak, Panama. **B)** Both capture methodologies take advantage of the ability to attract manatees with banana leaves and bunches. **C)** A baited trap (4x2m) made from red mangrove, *Rhizophora mangle* L., dug into the bottom substrate, similar to the ones used in West Africa described by Powell (1996). The manatee pulling on the banana bunch triggers the trap door, which is shown in the closed position. **D)** A baited natural cove with a human lookout equipped with a radio to alert a nearby boat when to sealed off the entrance with a long small-mesh net to enclose the manatees feeding inside. Images A-C by Gonzalez-Socoloske; Image D by AAMVECONA.

Study Site – Habitat Description



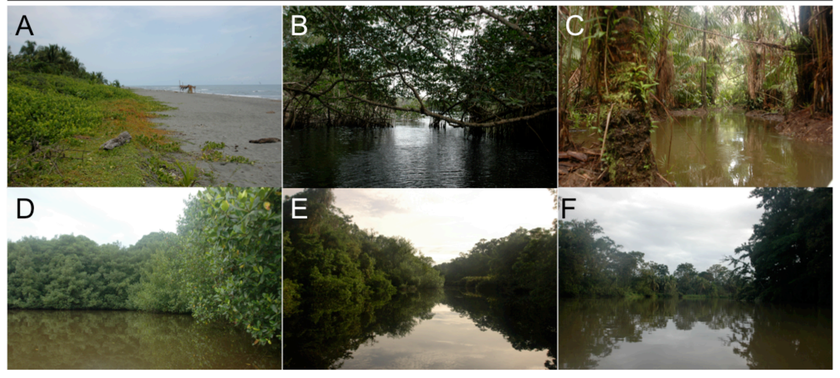


Fig. 2. Location of study site within SSPS, Panama, showing surface salinity and shore areas dominated by mangrove (thatch texture). Habitat images correspond to approximate locations indicated on map. **A)** Salt tolerant vegetation facing marine waters. **B)** Red mangrove, *Rhizophora mangle* L. **C)** Raffia palm swamp, *Raphia taedigera* (Mart.). **D)** Red and white, *Laguncularia racemosa* (L.) C.F. Gaertn., mangrove forests **E)** Mixed hardwoods and Leather fern, *Acrostichum aureum* L. **F)** Mixed hardwood trees and bank grasses (*Panicum* sp., *Bachiaria* sp., and *Axonopus sp.*). All images by Gonzalez-Socoloske.

Results – Manatee Capture

Table 1. Summary of manatee capture attempts in SSPS

	Baited Trap	Baited Cove
# days attempted	3	7
# manatees captured	0	1
Sex, max length	N/A	Female, 210 cm

Fig. 3. Successful manatee capture in SSPS. **A)** A smaller net was used to coral the manatee into the boat. **B)** The manatee was transported to a preset processing site (see Fig. 4. release location) where it was measured and biological samples were collected. **C)** The young manatee was fitted with an Argos/VHF tag. Images by capture team.

Results – Habitat Use

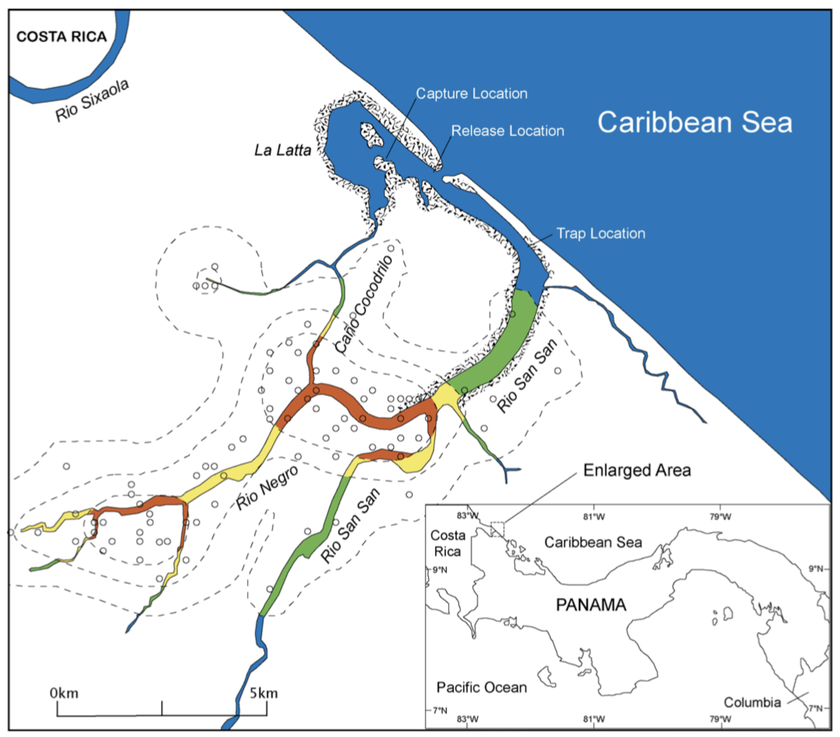


Fig. 4. Habitat use in SSPS by young female manatee "Manyu". Kernel densities of Argos locations class 2-3 (n =92, indicated by open circles) shown with dashed lines, 50% (inner rings-red), 75% (middle ring-red & yellow), and 90% (outer ring-red, yellow, and green).

Results – Summary of Argos Locations

Table 2. Summary of PTT locations obtained from Manyu between February 1-March 17, 2008

	Argos Classes				
	All	1	2	3	1-3
Locations	224 (100%)	55 (25%)	56 (25%)	36 (16%)	147 (66%)
Daily Ave ± SD	4.9 ± 1.8	1.2 ± 1.0	1.2 ± 0.9	1.2 ± 0.9	3.2 ± 1.8
Range	1-11	0-4	0-3	0-3	0-7

Conclusions & Implications for Conservation

- We conclude that SSPS is an adequate site for manatee telemetry studies and that using banana leaves to bait manatees was very effective.
- It appears that this manatee utilized two core areas – at the junctions of the Rio Negro and Caño Cocodrilo, and the Rio San San and the Rio Negro
- Although we are cautious to generalize about habitat suitability from the monitoring of one individual, SSPS appears to provide ample forage, protection, and freshwater, thus allowing for high site fidelity.
- More research needs to be conducted in SSPS. Future tagging studies may reveal the importance of nearby sea grass beds and possibly interchange with the manatee population in Costa Rica.
- Our study demonstrates the positive results that can be achieved when local NGOs and international academic groups collaborate for a common goal.

Literature Cited

Powell, J. A. (1996). The distribution and biology of the West African manatee *(Trichechus senegalensis*, Link 1795*)*. Regional Seas Programme, Ocean and Coastal Areas. United Nations Environmental Program. Nairobi, Kenya.

Acknowledgements

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