

studies on Sri Lanka's turtles, but should not be the last. The results pose more questions than they answer. Researchers in Sri Lanka, India and elsewhere are encouraged to develop partnerships and share resources to develop more telemetry and genetics studies on the countries' turtle populations. These should aim to fully determine the ecology, range and behaviours of these populations with a view to better informing future conservation efforts.

ACKNOWLEDGEMENTS

These figures are from Richardson *et al.* (2013) and I encourage anyone interested in a better understanding of this paper to visit www.seaturtle.org/mtrg/pubs/. I thank my co-authors for their invaluable contributions to that paper, and for the numerous Turtle Conservation Project staff and volunteers for supporting the tracking project. I also thank Dr BC Choudhury for sending me a copy of the note by Sivakumar *et al.* (2010).

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TRACKING LEATHERBACK TURTLES FROM LITTLE ANDAMAN ISLAND

ADHITH SWAMINATHAN[#], NAVEEN NAMBOOTHRI & KARTIK SHANKER

Dakshin Foundation, Bangalore, Karnataka, India

[#]adhith.me@gmail.com

INTRODUCTION

Leatherback nesting in India is currently restricted to the Andaman and Nicobar Islands (Andrews *et al.*, 2006). A long-term monitoring programme was established in 2008 at Little Andaman Island, and two index beaches, South and West Bay (Figure 1) were chosen to study the recovery of leatherback turtles after the earthquake and tsunami of December 2004 (Swaminathan *et al.*, 2011, 2017). Over the years, the objectives evolved to include monitoring of leatherback nesting at the index

beaches through a capture-recapture programme. The data indicate that leatherback nesting on Little Andaman Island has recovered substantially after the 2004 tsunami and seems stable with some fluctuations (Swaminathan *et al.*, 2017). One of the components of the project was to identify the post-nesting migratory routes of leatherback turtles nesting in this region. For the first time in India, leatherback turtles were tagged with satellite transmitters to understand their migratory routes and foraging sites (Namboothri *et al.*, 2012).

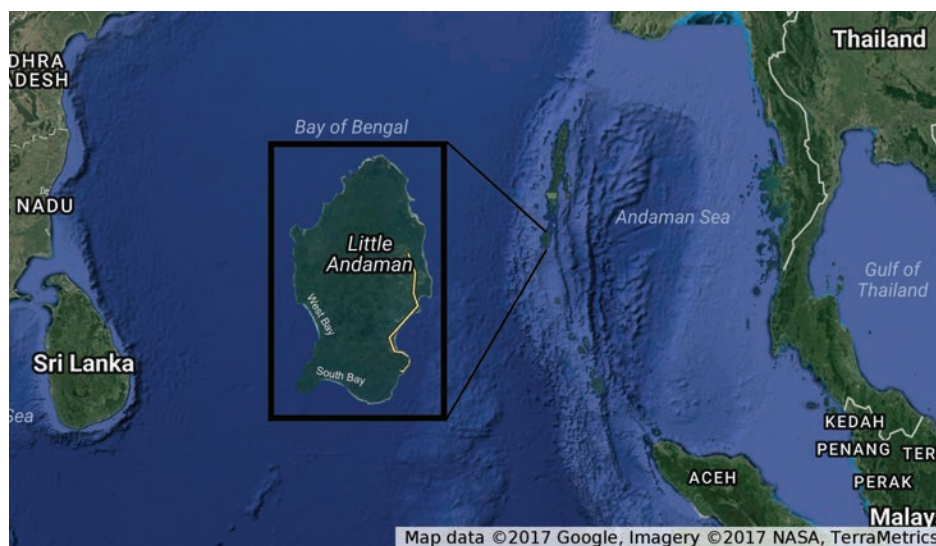


Figure 1. Map of Little Andaman.

METHODS

Between 2011 and 2014, ten nesting leatherback turtles were tagged with Platform Transmitter Terminals (PTT), model Kiwisat 202 (specially designed for leatherback turtles by Sirtrack Wildlife Tracking Solutions Ltd.), on West Bay beach. All satellite transmitters were equipped with a saltwater switch, programmed to transmit continuously for the first three months and every alternate day for the rest of the period. The PTTs were attached surgically onto the carapace of nesting females using the direct attachment method (Fossette *et al.*, 2008; Byrne *et al.*, 2009).

All tagged turtles were monitored regularly based on the data received through ARGOS and the data were analysed using the Satellite Tracking Analysis Tool (STAT; Coyne & Godley, 2005; www.seaturtle.org/STAT).

RESULTS

All the turtles tagged on West Bay, Little Andaman, initially travelled south and then predominantly in two directions: South East (five turtles) towards the western coast of Australia, and South West (four turtles) towards the eastern coast of Africa (Figure 2). Data about one turtle was not transmitted.

One of the tracked turtles (PTT ID No. 113335 tagged on 3rd February 2013) travelled southeast to the coast of Western Australia (6,713km) before transmission stopped (Figure 2). Another turtle (PTT ID No. 113336, tagged on 5th January 2014) travelled southwest to the Northeastern coast of Madagascar in 395 days, swimming 12,328km.

Similarly, PTT ID No. 113337 (tagged on 8th January 2014) travelled close to the western coast of Mozambique in 266 days, covering 13,237km; this turtle also travelled to the north-west coast of the Andaman and Nicobar Islands during the inter-nesting period and remained in the Andaman Sea for several weeks (post-nesting) before heading southwest. Turtle No. 113337 travelled an average distance of 49.8km per day (Figure 2; Table 1).

DISCUSSION

The patterns of movements demonstrated by adult female turtles tagged in 2013 and 2014 was consistent with those previously tagged in 2011 and 2012 (Namboothri *et al.*, 2012). They traverse much of the Indian Ocean during their foraging migrations, ranging as far east as Western Australia, and as far west as Mozambique and Madagascar. The migration strategy appears to be direct with open ocean crossing or indirect with movements along the coastal shelf. The average distance covered in a day by the nine turtles was 43.5 ± 13.8 km (StDev; Range 15.6-60.2km).

While we now have some insight into the migratory patterns of leatherbacks in the Indian Ocean, more satellite telemetry studies need to be carried out in subsequent years to assess if there are other migratory routes taken by the turtles nesting at Little Andaman. Additional data on dive behaviour and oceanography will help us better understand their migratory behavior and identify 'hot spots' where leatherbacks are vulnerable to fishing activities.

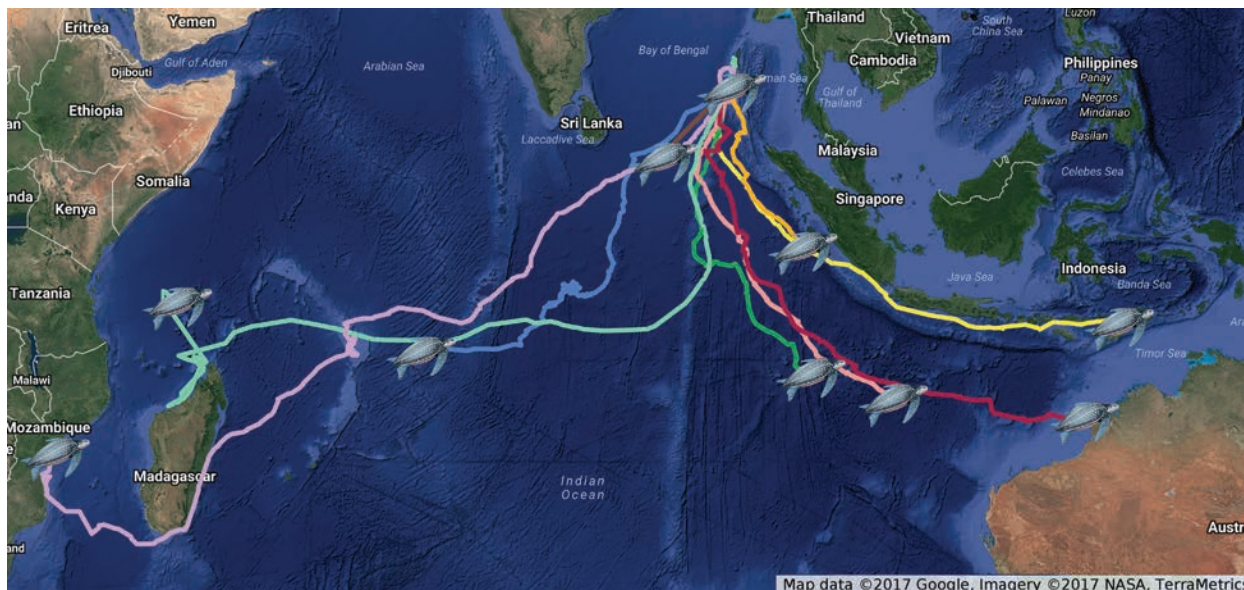


Figure 2. Post-nesting migratory routes of leatherback turtles nesting at Little Andaman. Turtle icons represent the tagging location and the last known locations for each individual turtle. For coloured tracks, see the pdf version, available on-line.

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Table 1. Satellite telemetry data of 10 female leatherback turtles tagged in West Bay, Little Andaman, from 2011-2014.

Turtle ID	Release Date yyyy-mm-dd	# Days Transmitted	Total Distance Travelled (km)	Average Distance Per Day (km)
103333	2011-01-04	179	7,312	40.85
103334	2011-01-04	69	1,077	15.60
103335	2011-01-05	92	4,600	50.00
103402	2012-02-13	77	4,634	60.20
113332	2012-01-23	183	6,998	38.24
113333	2012-01-23	51	2,690	52.75
113334	2012-01-23	-	-	-
113335	2013-02-03	125	6,713	53.70
113336	2014-01-05	395	12,328	31.20
113337	2014-01-08	266	13,237	49.80