

## ARTICLES



## RECENT NESTING RECORD OF THE LEATHERBACK IN COASTAL MYANMAR

STEVEN G. PLATT<sup>1#</sup>, CHRISTOPHER KINGSLEY<sup>2</sup>, AUNG ZINN LATT<sup>3</sup>, KALYAR PLATT<sup>4</sup>, & DAVID W. OWENS<sup>5</sup>

<sup>1</sup>Wildlife Conservation Society-Myanmar Program, Yangon, Myanmar

<sup>2</sup>Lampi Foundation, San Francisco, California, USA

<sup>3</sup>Wa Ale Island, Myanmar

<sup>4</sup>Turtle Survival Alliance, Yangon, Myanmar

<sup>5</sup>Grice Marine Lab, University of Charleston, South Carolina at the College of Charleston, Charleston, South Carolina, USA

#sgplatt@gmail.com

The leatherback (*Dermochelys coriacea*) ranges widely throughout the Indian Ocean, although nesting appears restricted to a few scattered areas (Nel *et al.*, 2015). In the northeast Indian Ocean and Southeast Asia, leatherbacks nest on the Indian mainland (small numbers), Andaman and Nicobar Islands, Sri Lanka, western coast of Thailand (small numbers), Sumatra, and Java (Nel *et al.*, 2015). The current situation in Myanmar with regards to leatherback reproduction is unclear. Historically, Maxwell (1911) reported leatherbacks nesting along the coast of Arakan (now “Rakhine”) State and Tenasserim Division (now “Tanintharyi Region”). However, the current status of these nesting populations is unknown and leatherbacks together with hawksbills (*Eretmochelys imbricata*) are considered the rarest of the five species of marine turtles occurring in the coastal waters of Myanmar (Holmes *et al.*, 2014; Thorbjarnarson *et al.*, 2000). We here report a recent confirmed record of *D. coriacea* nesting in Lampi Marine National Park (LMNP), Myanmar.

LMNP (10°50'N; 98°12'E; Figure 1) encompasses parts of the Myeik (formerly “Mergui”) Archipelago in Tanintharyi Region of southernmost Myanmar (Beffasti & Galanti, 2011). LMNP is administered by the Nature and Wildlife Conservation Division (NWCD) of the Myanmar Forest Department, and consists of Lampi Island and several smaller satellite islands, surrounded by an unmarked and ill-defined marine protected zone (Platt *et al.*, 2015). Although permanent settlements are prohibited on Lampi Island, four large villages (Ma Kyone Galet, Warr Kyun, Ko Phawt, and Salet Galet) containing in total > 3,000 residents are established on satellite islands within the

boundaries of LMNP (Beffasti & Galanti, 2011: 51; Platt *et al.*, 2015). Harvesting marine resources (primarily fish, squid, and sea cucumbers) provides the principal source of income for island communities (Beffasti & Galanti, 2011; Platt *et al.*, 2015). A biodiversity survey conducted in 2014 documented the occurrence of three species of marine turtles, including *D. coriacea*, *E. imbricata*, and *Chelonia mydas* in LMNP (Platt *et al.*, 2015). Known locally as *Leik Zaung Lyar* (= star fruit turtle), *D. coriacea* is regarded by fishers as extremely rare in LMNP and adjacent waters. A small turtle (carapace length ca. 400 mm) found dead on a baited hook in 2012 was the only recently verified occurrence of *D. coriacea* documented by Platt *et al.* (2015) in LMNP. Six beaches in LMNP (Bi Thauang, Kyauk Phyu Aw, Wah Ale Kyun, Honey Moon Beach, Hline Gyi Aw, and La Pyat Aw) are used for nesting by marine turtles (primarily *C. mydas*) (Figure 1). Although all sea turtles and their eggs are nominally protected, enforcement of existing laws was weak to non-existent at the time of the survey and most turtle eggs were being illegally harvested for domestic consumption or sale in local markets. Monitor lizards, semi-feral dogs, and macaques destroyed other turtle nests that escaped anthropogenic predation (Platt *et al.*, 2015).

Given the ubiquity of these threats and the absence of effective law enforcement, Platt *et al.* (2015) recommended that community-based marine turtle conservation efforts be implemented in collaboration with eco-tour operators granted concessions within LMNP. In accordance with this recommendation, a turtle nest protection and monitoring program was initiated

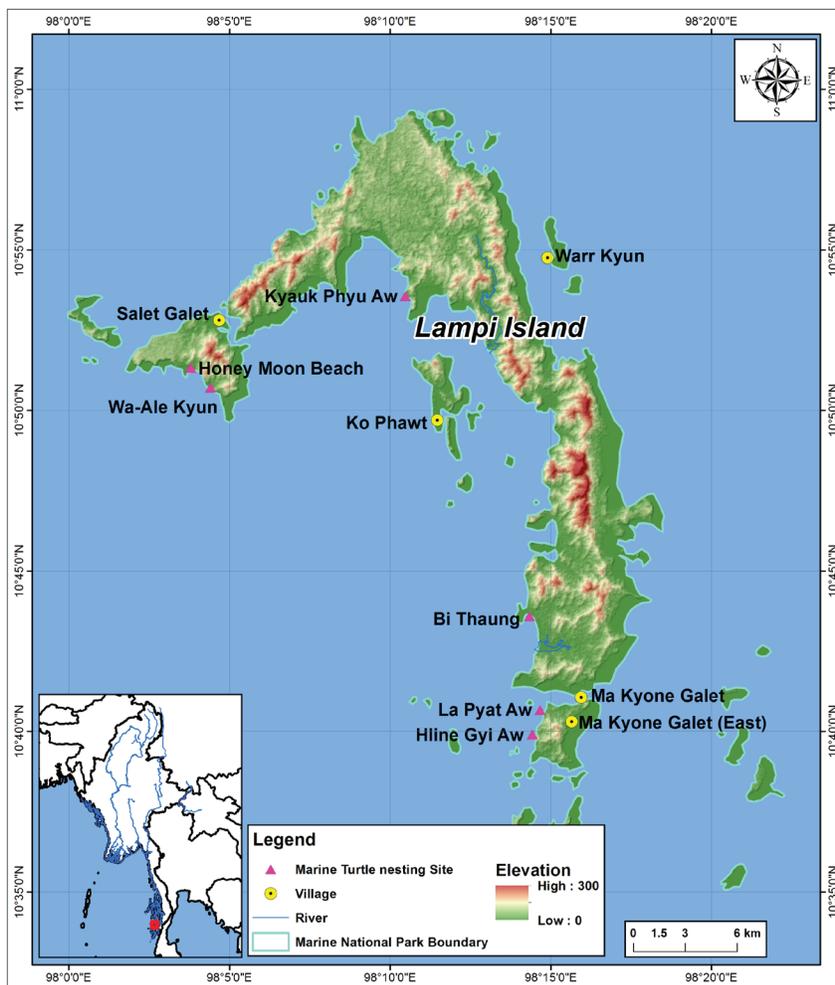


Figure 1: Lampi Marine National Park, Myanmar, showing locations of villages and marine turtle nesting areas. Map modified from Platt *et al.* (2015).

by Wa Ale Resort (Lampi Foundation) working together with NWCD during late 2015. As part of this effort, locally hired “Beach Wardens” conduct daily patrols of Wah Ale Kyun and Honey Moon beaches to search for signs of turtle nesting activity. During the 2016-17 nesting season, when freshly laid nests were encountered during patrols, they were marked and allowed to incubate in situ. Warning signs were posted at each nest and Beach Wardens provided 24-hour security to deter potential egg collectors. At the end of incubation, hatchlings exited the nests unassisted and made their way into the surf. On the morning after primary hatchling emergence, each nest was excavated to search for dead hatchlings or those that had been unable to successfully exit the nest chamber; the latter were collected, held until nightfall, and then released. Basic data were recorded for each nest, including dates of egg-laying and hatchling emergence, number of hatchlings (dead and alive) and unhatched eggs found when the nest was excavated, and species identification.

During the 2016-17 nesting season, 22 *C. mydas* nests and one *D. coriacea* nest were found on Wah Ale and Honey Moon beaches. Nesting occurred from 16<sup>th</sup> November 2016 through 7<sup>th</sup> May 2017, a period coinciding with the annual dry season in southern Myanmar. The single leatherback nest was found on Honey Moon Beach on 27<sup>th</sup> December 2016 the morning after the clutch was laid. Hatchlings emerged from the nest on the night of 22<sup>nd</sup>-23<sup>rd</sup> February 2017 following an incubation period of 59 days, within the range of eight to nine weeks given by Hirth (1980). Egg-laying occurred two nights before the New Moon (29<sup>th</sup> December 2016) and hatchlings emerged three nights before the New Moon (26<sup>th</sup> February 2017). Maxwell (1911) reported nesting by a single leatherback on 1<sup>st</sup> February; otherwise data on the reproductive phenology of this species are unavailable for Myanmar. Elsewhere in the region, leatherbacks nest from October through March with a peak in December (Limpus *et al.*, 1984; Eckert *et al.*, 2012; Swaminathan

*et al.*, 2017). Five live hatchlings and 11 unhatched eggs were found when the nest was excavated on the morning of 23<sup>rd</sup> February 2017. Yolkless eggs (Eckert *et al.*, 2012) may have been among those that failed to hatch, although this was not determined when the nest was excavated. The hatchlings were held during the day and released shortly after nightfall. Although the number of eggs in the nest was not determined, clutch size reported for other leatherback populations in the eastern Indian Ocean ranges from 29 to 140 eggs (Eckert *et al.*, 2012).

To our knowledge this is the first confirmed nesting of *D. coriacea* in Myanmar in recent years, one of the few nesting records ever reported for the country (Maxwell, 1911), and further highlights the importance of LMNP to marine turtle conservation in the region (see also Platt *et al.*, 2015). According to the IUCN (2017), recovery of the biologically relevant subpopulations of *D. coriacea* is dependent on successful conservation actions that mitigate current and future threats, especially those in breeding and foraging habitats. To this end, we recommend that nest protection and monitoring be continued at Wah Ale Kyun and Honey Moon beaches and extended to include Bi Thaung, La Pyat Aw, and Hline Gyi Aw beaches in the southern part of LMNP. These beaches host a number of turtle nests each year, yet remain unprotected and subject to illegal egg harvesting, especially the latter two sites which are easily accessible from Ma Kyone Galet Village (Platt *et al.*, 2015). Additionally, we strongly reiterate our earlier recommendation (Platt *et al.*, 2015) that existing fishing regulations within the protected area must be rigorously enforced, particularly the prohibition of commercial trawlers from within the legal exclusion zone. Outside of the protected area, marine turtle conservation hinges on the rigorous enforcement of regulations requiring the use of Turtle Excluder Devices on commercial fishing trawls (Aung Hlaing Win & Maung Maung Win, 2012; Holmes *et al.*, 2014). Without dramatic improvements in the effectiveness of conservation measures, all species of marine turtles will likely be approaching extinction in Myanmar by 2030 (Limpus, 2012).

#### ACKNOWLEDGEMENTS

We are grateful to Director General Dr. Nyi Nyi Kyaw and NWCD Director U Win Naing Thaw for granting us permission to conduct this project and for their long-term commitment to conservation in Myanmar. We thank Colin Poole, U Than Myint, U Saw Htun, and Daw Annie Chit for assisting with various aspects of this project. We also thank U Ba Tin for able assistance in the field, Deb Levinson and Thomas Rainwater for providing relevant literature, and Lewis Medlock for reviewing an early draft of this manuscript. A special

debt of gratitude is owed by CK to Bald Head Island Conservancy (North Carolina, USA) for spurring a long-standing interest in marine turtles, which ultimately led to the conservation program at LMNP.

#### Literature cited:

Win, A.H. & M.M. Win. 2012. Interaction between fishing activities and marine turtles in Myanmar. In: *Proceedings 11<sup>th</sup> SEASTAR2000 Workshop*, pp. 5-7. SEASTAR2000, Bangkok.

Beffasti, L. & V. Galanti. 2011. *Myanmar Protected Areas: Context, Current Status, and Challenges*. Milan: Instituto Oikos, BANCA, and Ancora Libri, Milan.

Eckert, K.L., B.P. Wallace, G.J. Frazier, S.A. Eckert, & P.C.H. Pritchard. 2012. Synopsis of biological data on the leatherback sea turtle (*Dermochelys coriacea*). U.S. Fish and Wildlife Service, Biological Technical Publication BTP-R4015-2012, Washington, D.C.

Hirth, H.F. 1980. Some aspects of the nesting behaviour and reproductive biology of sea turtles. *American Zoologist* 20: 507-523.

Holmes, K.E., T. Tun, K.T. Latt, M. Subedee, S.V. Khadke & A.E. Hostetler. 2014. *Marine Conservation in Myanmar-The Current Knowledge of Marine Systems and Recommendations for Research and Conservation*. Wildlife Conservation Society and Myanmar Marine Science Association, Yangon.

IUCN. 2017. The IUCN Red List of Threatened Species. <http://www.iucn.redlist.org>. Accessed on 27<sup>th</sup> July 2017.

Limpus, C.J. 2012. *Assessment of Turtle Conservation Actions at Thameehla Island, Myanmar*. Report to Department of Fisheries, Yangon, Myanmar.

Limpus, C.J., N.C. McLachlan & J.D. Miller. 1984. Further observations on the breeding of *Dermochelys coriacea* in Queensland. *Australian Wildlife Research* 11: 567-571.

Maxwell, F.D. 1911. Report on the turtle-banks of the Irrawaddy Division. In: *Reports on Inland and Sea Fisheries in the Thongwa, Myaungmya, and Bassein Districts, and Turtle-banks of the Irrawaddy Division*. Government Printing Office, Rangoon. Pp. 1-57.

Nel, R., K. Shanker & G. Hughes. 2015. Leatherback populations in the Indian Ocean. In: *The Leatherback Turtle: Biology and Conservation* (eds. J.R. Spotila & P.S. Tomillo), pp. 121-131. Johns Hopkins University Press, Baltimore, USA.

Platt, S.G., K. Platt, M.M. Soe, K.M. Myo, K.E. Holmes & T.R. Rainwater. 2015. Marine turtles and estuarine crocodiles in Lampi Marine National Park, Myanmar: A conservation and threat assessment with recommendations. *Herpetological Review* 46: 319-327.

Swaminathan, S., S. Thesorrow, S. Watha, M. Manoharakrishnan, N. Namboothri & M. Chandi. 2017. Current status and distribution of threatened leatherback turtles and their nesting beaches in the Nicobar Group of islands. *Indian Ocean Turtle Newsletter* 25: 12-18.

Thorbjarnarson, J.B., S.G. Platt & S.T. Khaing. 2000. Sea turtles in Myanmar: Past and present. *Marine Turtle Newsletter* 88: 10-11.

## ENTANGLEMENT OF A JUVENILE OLIVE RIDLEY TURTLE IN A GHOST NET IN THE ANDAMAN ISLANDS

ZOYA TYABJI<sup>1#</sup> & VARDHAN PATANKAR<sup>2,3</sup>

<sup>1</sup>Andaman and Nicobar Islands' Environmental Team (ANET) - Centre for Island Ecology, Port Blair, Andaman Islands, India

<sup>2</sup>Centre for Wildlife Studies, Bengaluru, Karnataka, India

<sup>3</sup>National Centre for Biological Sciences, Tata Institute of Fundamental Research, Bengaluru, Karnataka, India

#zoya.tyabji@gmail.com

Accidental entanglement of turtles in abandoned fishing nets has been, and will likely continue to be, a major threat to sea turtles (Wilcox *et al.*, 2015). The impact of abandoned or lost nets, also known as ghost nets, can occur far from their point of origin as nets may drift far distances with ocean currents (Stelfox *et al.*, 2015). Turtles that swim through ghost nets may get their body or flippers snagged in the net, potentially leading to lost circulation and injury to flippers, drowning, or prevention from feeding to the point of starvation (Arthur *et al.*, 2014). Entangled turtles may also end up towing large amounts of fishing gear, resulting in exhaustion and, eventually, death. The animals that escape with severe injuries are highly prone to bacterial infections (NOAA, 2014).

During a coral reef survey on 9<sup>th</sup> May 2016, between 11°54'47.35" N and 93°00'58.94" E at Havelock Island, South Andaman (Figure 1), we encountered what appeared to be a discarded net floating in the water, 1 km from the coastline. On approaching it closer, we identified a juvenile olive ridley turtle (~45cm curved carapace length) and a dead snapper (*Lutjanus boahr*) entangled in the net. Schools of juvenile golden trevally (*Gnathanodon speciosus*), scissortail sergeant (*Abudefduf sexfasciatus*), fusiliers (*Caesio varilineata*) and rudder fish (*Kyphosus* sp.) were swimming close to the dead snapper, some feeding off it. The turtle was thrashing in the water, struggling to surface. The net was made of nylon fibre and was drifting with the current. We released the turtle from the net by cutting the latter with a knife, and lifted the turtle onto the boat to examine it for injuries. The turtle was observed to be harshly gulping in air but had no obvious external injuries

and was released back into the sea within 5 minutes.

The olive ridley turtle is an abundant circumglobal species, known to nest sparsely on several beaches on the east coast of the Andaman Islands, and east and west coasts of the Nicobar Islands (Frazier, 1987; Andrews *et al.*, 2006), with an important mass nesting site in Cuthbert Bay Wildlife Sanctuary, Middle Andamans (Namboothri *et al.*, 2015). Information on the natural history of juvenile olive ridley turtles is limited, but the life stage is believed to spend their years drifting with oceanic currents (Shenoy *et al.*, 2011; Stelfox *et al.*, 2015). Our observation of a juvenile olive ridley turtle in the open sea is in concurrence with what is known.

The observed incident highlights the threat of ghost nets to sea turtles and other marine wildlife. Awareness programs for local youth, beach clean-up activities, regional workshop for artisanal fishermen on how to ethically dispose of fishing gear, and cooperation between government organization, NGO's and community members could help in reducing the at-sea disposal of abandoned and discarded fishing gear and thus avoid accidental entanglement of turtles (Stelfox *et al.*, 2014).

### ACKNOWLEDGEMENTS

We would like to thank the Andaman and Nicobar Administration and the Department of Environment and Forests, Port Blair, for granting us permits to conduct coral reef surveys in the area and Department of Science and Technology, Government of India, under the DST-INSPIRE Faculty Programme for funding support. We especially thank the Divisional Forest Officer, Mr Shazi