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OLIVE RIDLEY PROJECT: ACTIVELY FIGHTING GHOST NETS IN THE INDIAN OCEAN

MARTIN STELFOX, DAVID BALSON & JILLIAN HUDGINS

Co-founders of the Olive Ridley Project, Indian Ocean

oliveridleyproject@yahoo.com

Introduction

The Olive Ridley Project was initiated in response to large numbers of olive ridleys turtles (*Lepidochelys olivacea*) found entangled in fishing nets in the Maldives. This species of sea turtle is rarely observed in the Maldives; however, since 2011 marine biologists, dive masters and boat captains have recorded 47 olive ridleys entangled in fishing nets. The recorded entanglements have occurred through chance encounters suggesting the data only reflects a small proportion of the actual number of ghost net entrapments of olive ridleys in this region. Since the inception of the Olive Ridley Project in July 2013 a further 20 olive ridleys have been found. Often turtles spend extended periods of time entangled in nets and their condition quickly deteriorates. Dehydration, amputations and deep lacerations are some of the injuries sustained. The risk of predation by opportunistic predators increases when entangled and defenceless and this brings with it further trauma to the turtles. Once found, their condition can be so severe that often they do not survive. Dedicated teams in the Maldives, Sri Lanka and India are working towards rehabilitating injured turtles, but the problem continues.

Net fishing techniques

Unfortunately artisanal and commercial fisheries

surrounding the Indian Ocean rely heavily on fishing nets. Net fishing bycatch is difficult to accurately estimate as records are absent or poorly kept (Amandè *et al.*, 2010) but is thought to be responsible for ecological effects on key species such as turtles, sharks, rays, mammals and other marine organisms that are relevant to ecosystem structure and function (Garcia *et al.*, 2003).

Population growth leads to increased competition for natural resources throughout the world. Artisanal fisheries have to compete with large commercial fisheries and each other for healthy catches, which often leads to travelling greater distances and illegal fishing activity. Trawling, seine and gill netting methods make up the different techniques practiced in the Indian Ocean.

Fishing nets made of nylon are easily broken. Some communities in Sri Lanka use nets for only 6 days before they become too damaged and need to be replaced (M. Stelfox 2013, pers.comm., 10 November). In addition nets often become entangled on the sea floor during use and removal becomes almost impossible. Net fishing is not only unsustainable but when discarded at sea the nets remain very effective long after use. They are also very expensive for the fishermen and communities waste a significant amount of money replacing lost or damaged nets (M. Stelfox 2013, pers.obs.).



Figure 1. Olive ridley trapped in ghost net.

Photo credit: Chiara Fumagalli

What are ghost nets?

Ghost nets are any fishing nets that have been lost abandoned or discarded in the Ocean. Unfortunately these nets continue to trap marine species long after they become ghost nets. The true extent of the problem in the Indian Ocean is unknown; however, fish stocks are under ever increasing pressures and ghost nets contribute significantly to the balance of this delicate ecosystem.

Where the nets come from?

Line and pole is the primary fishing technique used in the Maldives, which ensures catches are extremely selective and bycatch rate is around 4% (Ardill *et al.*, 2013). However, bait fish are caught by fishing nets and a small proportion could become ghost nets.

The two main monsoon seasons in the Indian Ocean bring with them changing current patterns and these play a significant role in ghost net distribution. Fishing methods in Sri Lanka and India rely heavily on nets and practices still remain largely unsustainable. It is likely that ghost nets that remain in the ocean are subject to strong currents surrounding the coastal regions meaning they can travel great distances in a relatively short space of

time. Encounters between nets and olive ridleys and other marine life are extremely likely and currents eventually bring entangled wildlife to the Maldives. The West Indian Coastal Current may be responsible for bringing nets and turtles to the Maldives in the South-West Monsoon, while the East Indian Coastal Current and the North Monsoon Current may be carrying nets eastwards towards the Maldives during the North-East Monsoon.

Analysis of current maps reveal other areas in the Indian Ocean where ghost nets may originate and we are looking at reaching out to Oman, Mauritius, Seychelles and Madagascar to target other ghost net hot spots.

What are we doing?

Currently, 94 net samples have been analysed and removed from the Indian Ocean, collected from India, Sri Lanka and the Maldives. We continue to collect net data and add to our database. We hope to eventually identify what types of fisheries significantly contribute to ghost net numbers. We are also in the process of analysing current models to identify potential origins and final destinations of ghost nets.

We actively work with artisanal fisheries to understand the



Figure 2. Undhoodoo Island, in Baa atoll, Maldives, an uninhabited island with a ghost net on its beach.

Photo credit: Olive Ridley Project

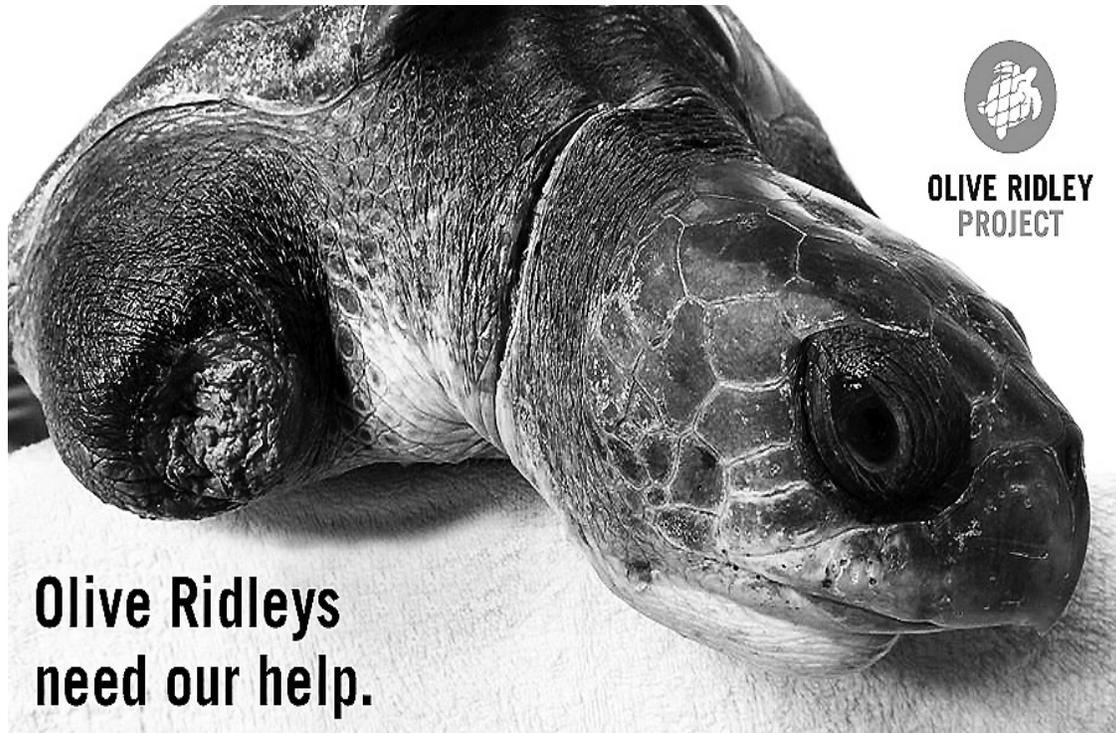


Figure 3. Injuries sustained by an olive turtle after rescue from a ghost net. Double amputation of front flippers and deep lacerations around neck occurred during entanglement.

Photo credit: Olive Ridley Project

problems fishermen face on a daily basis. We consolidate information from individuals working with fishing communities in the Indian Ocean. We are working towards effective alternatives that communities could adopt to improve their catch rates, reduce bycatch, and prevent their fishing nets from ending up in the ocean. We are also expanding our network in the Indian Ocean to create a platform for others to share ideas and target this problem.

How can we become involved?

Awareness is a large part of what we do and by reaching out to a large audience we are able to raise our profile, and connect with similar people/organisations working out in the field. Awareness can be increased through blogs, social media posts or website features specifically focusing on how people can get involved and contribute to the Olive Ridley Project. We also try to attend symposiums and workshops to spread our message; please email us if you are interested in contributing. We welcome anybody with an interest.

Scientific data can help us understand the true threat ghost nets pose in the Indian Ocean; currently data on ghost nets in this region is insufficient and, in response, we have created a database collecting information on any ghost net found either on beaches or at sea. We take basic parameters such as webbing size, twine dimensions, twist direction, material and knot construction. A detailed explanation of this method of data collection can be found on our website or Facebook group. We are happy to collect information from anybody that

may come across ghost nets whilst walking beaches or out diving in the Indian Ocean. This information adds to our database to understand how many nets are out there, and where they may be coming from.

We also welcome contributions from NGOs, organisations or individuals working closely with artisanal and commercial fisheries. Information on incidental catches, target species and number of lost nets play an important part in understanding ghost nets in the Indian Ocean. The amount of money that is wasted by communities to replace broken nets can also contribute towards effective alternatives and sustainable fishing practices.

If you would like to get involved or have any further questions please email oliveridleyproject@yahoo.com.

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HOW MANY HATCHERIES?

ANDREA D PHILLOTT[#], JIBY MOL MATHEW & NIMISHA K.

Asian University for Women, Chittagong, Bangladesh

[#]andrea.phillott@auw.edu.bd

Thanks to the IOTN readers in India who have contributed information to help us determine the contribution of hatcheries in the Indian Ocean and south-east Asia to sea turtle conservation. A larger dataset would be more valuable, and those involved with hatchery management can obtain a copy of the survey from Dr. Andrea Phillott at andrea.phillott@auw.edu.bd. A summary of results will be published in a later issue of IOTN. ■
