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**MEMORANDUM OF UNDERSTANDING  
ON THE CONSERVATION AND  
MANAGEMENT OF MARINE TURTLES  
AND THEIR HABITATS OF THE INDIAN  
OCEAN AND SOUTH-EAST ASIA**

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9<sup>TH</sup> MEETING OF THE ADVISORY COMMITTEE  
*online*, 15-19 March 2021  
Agenda Item 16

**CONCEPT NOTE**

**ESTIMATION OF THE IMPACT OF EGG RELOCATION AND HATCHERY PRACTICES ON  
CRITICALLY LOW POPULATIONS IN THE IOSEA REGION, AND PRACTICAL SOLUTIONS**

## Concept note

### Estimation of the impact of egg relocation and hatchery practices on critically low populations in the IOSEA region, and practical solutions

#### Background

In 2012, the Indian Ocean – South East Asia Marine Turtle Memorandum of Understanding (IOSEA MoU) updated its assessment of the status of Leatherback turtles (initially compiled in 2006) in the IOSEA region. The assessment was discussed by IOSEA Signatory States in **September 2014 at their Seventh Meeting**. Among a list of priority projects recommended by the IOSEA Advisory Committee on the basis of this assessment, and endorsed by Signatories, one focused on **estimating the impact of egg relocation and hatchery practices on critically low populations of leatherback turtles** in the IOSEA region.

The IOSEA Leatherback Assessment had been prepared upon the request of IOSEA Signatory States, in recognition of the importance of compiling up-to-date information on the status of species covered by the MoU. Indeed, it was agreed that knowing the distribution, abundance and threats to marine turtles in the IOSEA region could allow for better identifying necessary conservation actions by policy-makers and organisations operating on the ground. These should focus on ‘**priority populations**’ (most at risk) and address threats by taking into account existing human-turtle interactions on the ground.

Five species of marine turtles around the IOSEA region are listed on the IUCN Red List of Threatened Species. (The determination of the status of flatback turtles is impossible due to data deficiencies.) The threats they face are multifold and include entanglement in fisheries gear, egg collection, poaching of adults, destruction of nesting and foraging grounds through coastal development, and inappropriate management of turtle hatcheries. Conservationists are therefore continuously trying to increase turtle populations by different means, including artificial hatcheries. The Steering Committee of the **Bellagio Sea Turtle Conservation Initiative** identified in 2008 the relocation of “eggs/nests at risk” as a potential solution to enhance hatching success at **some key rookeries where erosion, elevated sand temperature, human poaching and natural predation put the population at risk**. Yet, little is known about the impact on leatherback turtle populations, as well as on all other turtle species also nesting in the IOSEA region, of the nest relocation and hatchery activities currently in use in some countries.

Some of the reports that exist **claim** that **in a number of countries** of the IOSEA region such as in southern Indonesia, Malaysia<sup>1</sup> and Sri Lanka<sup>2</sup>, **leatherback hatcheries are functioning with reduced hatching success**, and **produce incorrectly imprinted and physically compromised hatchlings** with **distorted sex ratios**. In other countries, such as in Thailand, the potential impacts of nest relocation and hatchery practices on critically low populations of marine turtles

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<sup>1</sup> In Malaysia, leatherback eggs are being moved to a government hatchery (Nick Pilcher, Marine Research Foundation, pers comm). In the past the hatching success had been acceptable (40 – 50%), but with a possible female bias (Steering Committee, Bellagio Sea Turtle Conservation Initiative, 2008) due to very warm incubation temperatures in polystyrene boxes. From 2006 to 2012, incubation temperatures have diminished, but hatching success also declined to almost zero. The reasons are unknown, and urgent research into the problem was deemed necessary by the leatherback assessment.

<sup>2</sup> Brodie et al (2008) refer to leatherback hatcheries in southern Sri Lanka (including 9 government-operated hatcheries that occasionally incubate leatherback eggs). At the IUCN Meeting held in March 2015 in Karachi, Mr. Thushan Kapurusinghe, Project Leader, TCP highlighted the management of Sea turtle hatcheries in Sri Lanka. Based on findings of an investigative study conducted in 2011, he mentioned that all existing marine turtle hatcheries management in the southern coastal belt of Sri Lanka were deficient and operating illegally. The study revealed scientific weakness in hatcheries management in terms of keeping too many hatchlings in tanks together, mixing different species of hatchlings in tanks, delays in reburying eggs, keeping critically endangered hawksbills, releasing hatchlings during the day time, taking turtles out of the tanks for photos and releasing hatchlings from the same place.

(of any species) remain unknown. A coordinated education and enforcement approach from governments, regulatory agencies and NGO groups, to ensure that relocation practices to hatcheries or rather stable sections of the beach are adequate in those countries, is needed for an improved conservation of all species of marine turtles around the IOSEA region.

## Objective

The aim of this project is to review nest relocation and hatchery practices in selected countries of the IOSEA region and, where appropriate, suggest and assist in the implementation of management interventions to enhance hatching success and produce balanced sex ratios. The main outcome will be to build local capacity of governments, regulatory agencies and NGOs to decrease mortality of marine turtle hatchlings in nests relocated to artificial hatcheries or to other stable sections of the beach in the IOSEA region, with a view to ensure increased hatching output.

## Activities

The following activities will be conducted, in chronological order:

#	Activity	Comment	Timeline
1	Review the extent of marine turtle nest relocation and hatchery practices in the IOSEA region (particularly Thailand, Indonesia, Malaysia, Sri Lanka, ...). This will include listing hatcheries currently running, as well as estimating the number of nests/eggs relocated and the number of hatchlings released.	Start with data from the IOSEA website, complemented by data of local NGOs and governmental agencies running these ventures.	4-5 months
2	Review the impact of egg relocation and hatchery practices.	Through field work, quantify: (a) The hatchery's performance: sex ratio, mean clutch size, hatching success, mortality rate, time of release, ... (b) The local stakeholders' perception of the impacts of nest relocation (positive/negative) on the marine turtle population dynamics. This kind of data can be obtained by using Participatory Rural Appraisal (PRA) techniques, including one-off encounters with neighbouring residents and face-to-face interviews with local stakeholders. (c) The impact of natural and anthropogenic factors on hatching success of nests left <i>in-situ</i> (d) The resources (personnel, financial, etc.) available and the	7-8 months

		logistics of nest relocation to maximize effort.	
3	Identify the best practice nest relocation strategy (whether to a hatchery or to other sections of the beach) within each local context.	Work with local partners (government representatives, NGOs, regulatory agencies) and projects within each country to develop realistic strategies and protocols for nest relocation suitable to the context of their beaches.	3-4 months
4	Outcomes: 5a. Draft a brochure / other training materials to highlight best practice principles in nest relocation and hatchery practices. 5b. Draft a set of recommendations for management interventions to be undertaken in key countries to enhance hatching success and produce balanced sex ratios	Start from existing manuals and guidelines and complete/update them with results of the current project. Use appropriate communication strategies and IOSEA network to disseminate new information produced.	2-3 months

### Partners

*IOSEA Secretariat (initial coordination)*

*IOSEA Advisory Committee:*

- Dr. Col. Limpus
- Dr. Jack Frazier
- Dr. Mark Hamann
- Dr. Manjula Tiwari

*One PhD student, with expert advice*

*Selected staff of all existing hatcheries identified in phase #1 of the project*

*Local NGOs; Local regulatory agencies*

For Indonesia:

- Bali Sea Turtle Society (BSTS)
- Conservation International – Indonesia
- Ministry of Forestry, Directorate General of Forest Protection and Nature Conservation, Directorate of Biodiversity Conservation
- Hasanuddin University, Laboratory of Biology Conservation
- Faculty of Veterinary Medicine, Udayana University, Denpasar Campus
- Indonesia Sea Turtle Research Center
- ProFauna Indonesia, Bali Office

The Nature Conservancy - TNC-Indonesia For Malaysia:

- Department of Fisheries Malaysia
- Help Our Penyu
- Juara Turtle Project
- Ma' Daerah Turtle Sanctuary Centre
- Marine Research Foundation

- Melina Beach Turtle Hatchery
- Sabah Parks
- Sea Turtle Research Unit (SEATRU)
- Turtle Conservation Society
- Universiti Malaysia Sarawak, Institute of Biodiversity and Environmental Conservation
- WWF Malaysia

For Sri Lanka:

- Department of Wildlife Conservation
- Turtle Conservation Project (TCP)
- IUCN Sri Lanka.
- Sri Lanka Tourism Development Authority
- National Zoological Gardens
- National Aquatic Resources & Development Agency (NARA)

For Thailand:

- Department of Marine and Coastal Resources, Ministry of Natural Resources and Environment
- Mai Khao Marine Turtle Foundation
- Marine Conservation Koh Tao
- Naucrates Onlus, Friends of Sea Turtles
- Office of Natural Resources and Environmental Policy and Planning
- Pure Blue Foundation

### Indicative Budget

Activity	Costs	Budget needed
Desk-based research work	None (PhD student project)	-
Field work at artificial hatcheries (cost depending on number of sites)	<ul style="list-style-type: none"> <li>- Travel to hatcheries</li> <li>- Printing of questionnaires and survey forms</li> </ul>	USD 1,000
<b>TOTAL</b>		<b>USD 1,000</b>