



# Increasing Observations of Fatal Fluke Entanglements of Indo-Pacific Dolphins (*Tursiops Aduncus*) with Discarded Fishing Gear in The Northern Red Sea, Egypt

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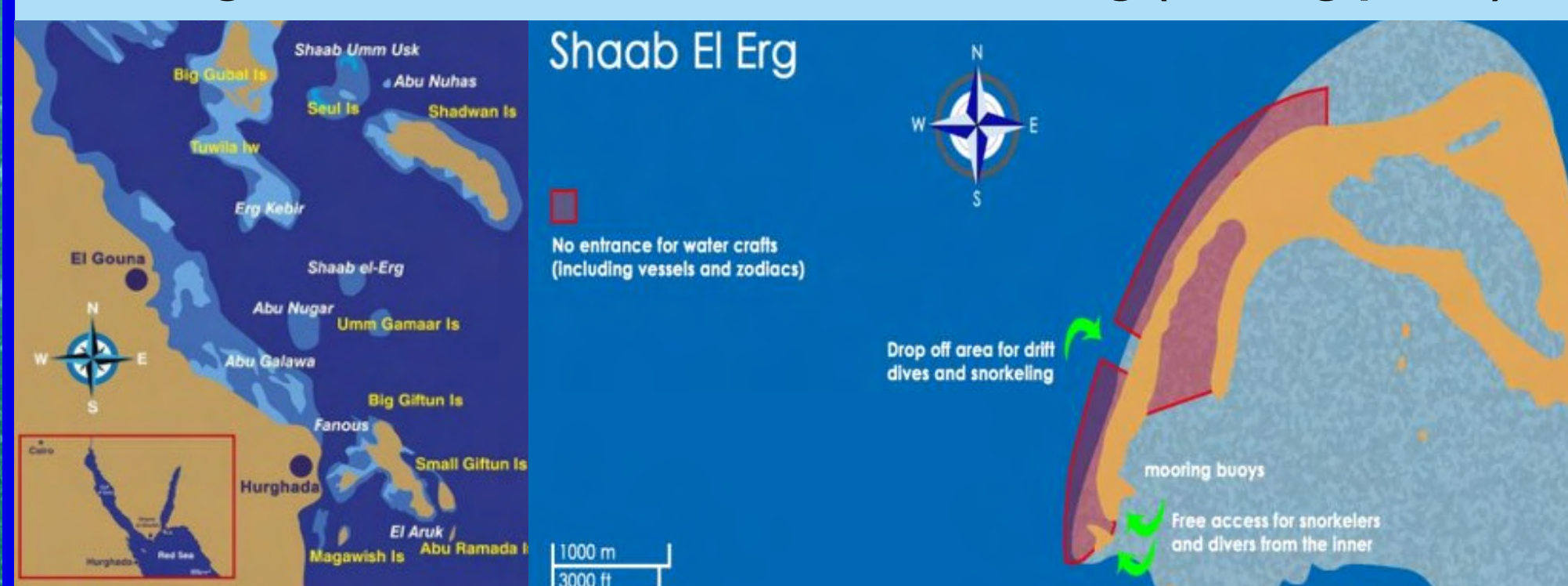
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## Introduction

Entanglement with discarded fishing gear and bycatch pose significant threats to cetaceans globally. In the coral reefs near Hurghada in the Northern Egyptian Red Sea, Indo-Pacific bottlenose dolphins (*Tursiops Aduncus*) (IPBD) are often found with ropes and fishing lines tightly wrapped around their tail flukes. Between 2011 and 2024, 11 entangled IPBDs had been observed, with 3 new cases recorded during a 3-week survey in Nov 2023. Notably, all entangled individuals have been juvenile males and calves, highlighting their enhanced vulnerability. The origin of these entanglements is uncertain, raising concerns about population-level impacts on this population.

## Survey Area

**Our study area ranges from 600 km<sup>2</sup> along the coastline of Hughada and El Gouna, Egypt, and all entangled dolphins were sighted within the reef of Shaab El' Erg (resting place).**



## Methodology










**Boat-based photo identification of IPBDs using the mark-recapture technique and underwater focal follows using videography were used as part of a long-term and ongoing life history and behavioural study to obtain whole-body identification of individuals.**

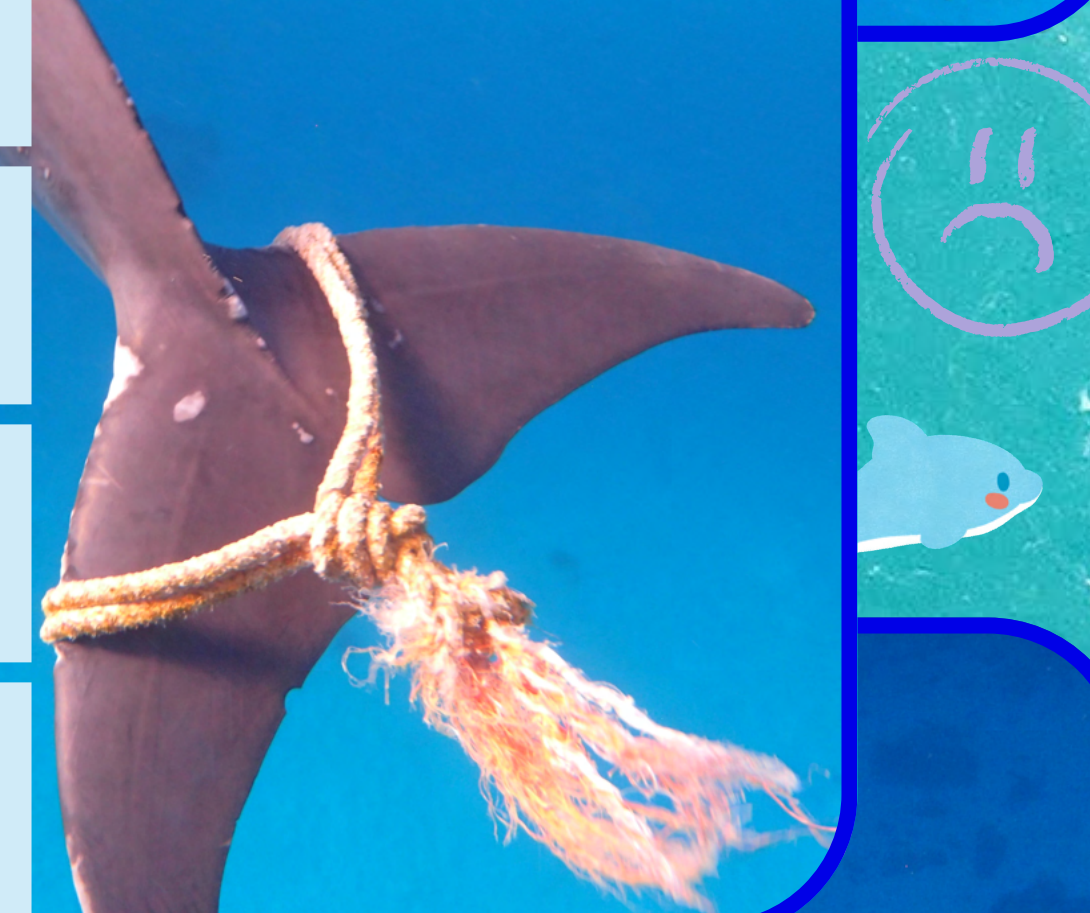
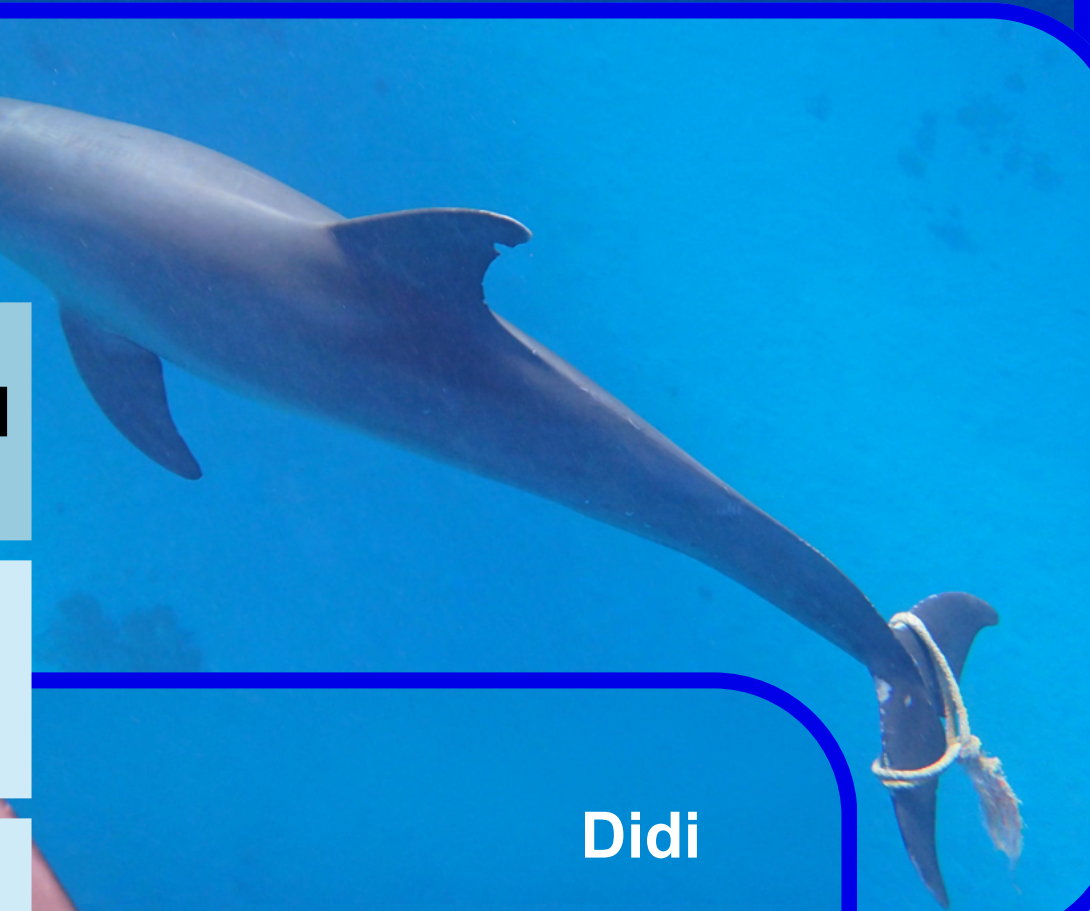


## Observation

**Among the 11 observed cases, four individuals were confirmed deceased, with only two re-sighted without an entanglement.**



ID	1st enc. Entangled	Last Sighted	Rescue Attempts	Stress Related Behaviours and Symptoms	 Living	 Deceased
Monty	November 2023	February 2024	1	Infection on the entanglement, laboured swimming, emaciation and morbidity		
Didi	November 2023	February 2024	2	Fluke slaps, avoidance and rubbing on mooring lines to remove rope (lost rope)		
Ruben	November 2023	February 2024	1	Fluke slaps, avoidance, and rubbing on the sand to remove rope		
Hassan	April 2022	June 2022	4	Fluke slaps, avoidance and rubbing on mooring lines to remove fishing line		
Latif	September 2020	November 2021	3	Infection on the fishing line entanglement area and avoidance		



## Entanglement related Health Issues

### Amputation of distal body parts (dorsal, pectoral fins or fluke)

## Ingestion of fishing hooks

laceration of blood vessels

- ▶ **Emaciation and/or starvation**

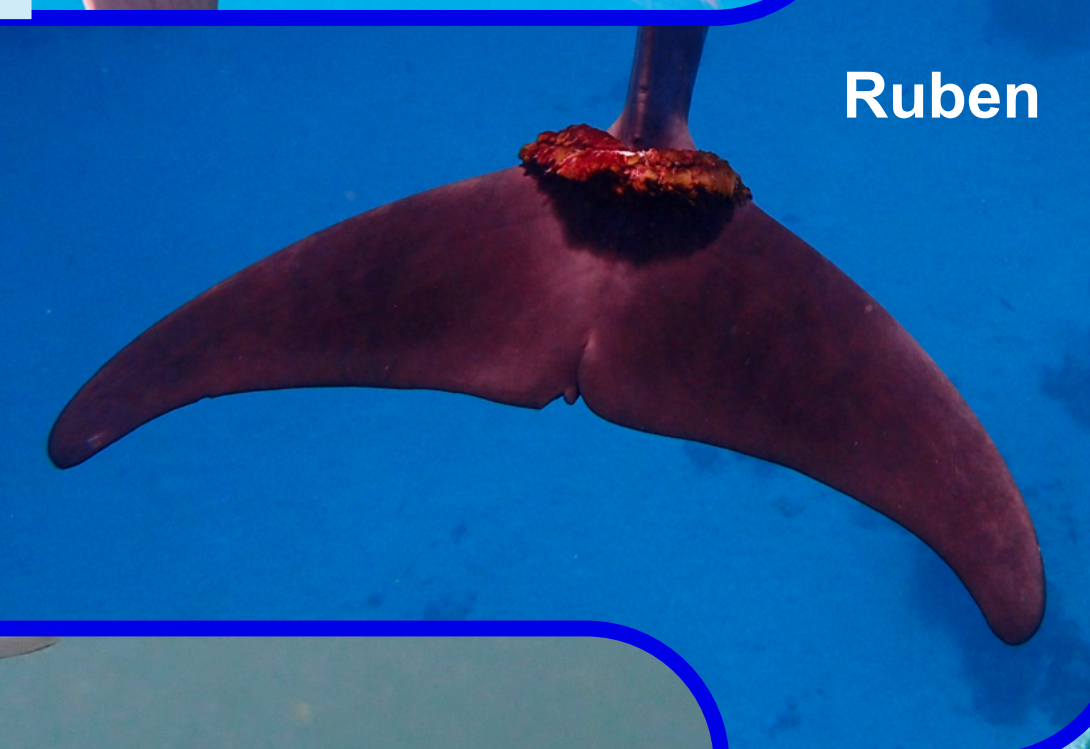
Sub-lethal injuries or death

## Systematic infections from open wounds

**Felix et al (2015)**

## Functionality of Rope Rubbing

- Sensual pleasure
- Facilitate moulting
- Hygiene
- Individual and group play activity



## Discussion

Delphinids rub against living and inanimate objects such as rope debris and mooring lines. One theory is that entanglement is attributable to play behaviours. Wild dolphins in The Red Sea, and, Posorja, Ecuador, have been observed whirling their bodies both ventrally and dorsally onto ropes to repeatedly rub all body parts, potentially causing entanglement [2]. Dolphins are also accidental victims of non-targeted bycatch and encounters with ghost nets, thus causing entanglements with different rope types [3]

## Solutions

We propose a practical Marine Mammal Medic and entanglement course with the British Divers Marine Life Rescue (BDLMR) to train key personnel on the ground for future entanglement rescues, in conjunction with eliciting wider discussions on potential methodologies on how to rescue affected individuals. In summary, entanglements have implications for individual welfare and survival, and for a relatively small population, it's unclear whether entanglement incurs deleterious population-level effects, thus assessments are urgently needed to inform conservation management actions.

## Acknowledgement

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[1] Morlock, G.E., Ziltener, A., Geyer, S., Tersteegen, J., Mehl, A., Schreiner, T., Kamel, T. and Brümmer, F., 2022. Evidence that Indo-Pacific bottlenose dolphins self-medicate with invertebrates in coral reefs. *Iscience*, 25(6).

[2] Félix, F., 2015. Rope rubbing social play behaviour recorded from wild bottlenose dolphins (*Tursiops truncatus*) in Ecuador. *Aquatic Mammals*, 41(2), p.222.

[3] Nicholson, K., 2023. Entanglement in recreational fishing gear poses a threat to estuarine and coastal dolphins: Animal welfare and population-level impacts should guide intervention decision-making. *Marine pollution bulletin*, 192, p.115094.