

O. Alejandra Vargas Fonseca (DVM)
PhD candidate
Department of Zoology
Nelson Mandela Metropolitan University
T: +27 (0)72 444 7090

Summary Report

The role of marine protected areas in the population dynamics and conservation of Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) along the southeast coast of South Africa

The Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) mostly utilise inshore waters and are susceptible to anthropogenic pressures. *T. aduncus* was recognized as a separate species in 1999 and considered by the IUCN Red List of threatened species as “data deficient”. Limited information on *T. aduncus* is matched by a poor understanding of the effectiveness of current protection measures including protected area networks for the conservation of these marine top predators. This study aims to further our understanding of *T. aduncus* population abundance, spatial and temporal distribution, habitat use and genetic structure along the south east coast of South Africa. Emphasis is placed on assessing the dolphins’ utilization of the marine protected areas (MPAs) network, identifying hotspots of activity outside of the MPAs and explain spatial and temporal variability in dolphin presence and activity patterns. Preliminary results from 50 field surveys (2013-14) indicates that habitat use and preferred areas have remained constant, relative to a previous assessment in 2002-03, but there has been a decrease in the presence of the species in this area concomitant with a decrease in average group size. Low re-sighting rates of known individuals based on fin characteristics seem to confirm that *T. aduncus* in the study area are migratory, however further validation is

required.

The SMM grant awarded was used to help cover field expenses for this PhD project. The preliminary results were included as a poster presentation for Southern African Marine Science Symposium in July 2014. The final results are intended to be published in pre-reviewed publications.

A group of dolphins is swimming in clear turquoise water. The dolphins are dark grey or black, and their dorsal fins are visible above the water's surface. The water has a vibrant greenish-blue hue with some white foam from the dolphins' movements. The dolphins are scattered across the frame, with some appearing closer to the viewer than others.

GARDEN ROUTE

DOLPHIN RESEARCH &
ACOUSTIC MONITORING



THE GARDEN ROUTE is located along part of the southern coast of South Africa. Its coastal zone is characterised by highly diverse marine fauna, including a variety of marine mammals, seabirds, fishes and invertebrates. To conserve the precious coastal ecosystems found in this region, three Marine Protected Areas (MPA) have been proclaimed: Goukamma (14km, Est. 1990), Robberg (9.5km, Est. 2000) and Tsitsikamma (57km, Est. 1964 and South Africa's oldest MPA).

MPAs serve as vital refuges for both fish and marine top predators (e.g. whales and dolphins), but their coverage may be inadequate to meet the conservation needs of some of these species.



//STUDY AREA

The project is taking place from the eastern boundary of the Tsitsikamma MPA through to the western boundary of the Goukamma MPA; including the Robberg Peninsula MPA. All three MPAs are adjacent to a terrestrial Nature Reserve or National Park. The total research area covers approximately 170km of coastline (See Map).

//WHY THIS PROJECT?

The Garden Route Dolphin Research Project aims to better understand how these marine top predators use their habitat along South Africa's coast. It looks at the role of existing MPAs in terms of whether particular cetaceans are of conservation concern and require some form of management intervention.

The International Union for Conservation of Nature (IUCN) Red List of Threatened Species currently lists the Indo-Pacific humpback dolphin (*Sousa chinensis*) as a near-threatened species and the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) as a "data deficient" species, meaning that too little is currently known about the status of this marine mammal.

The study of dolphins and whales along the Garden Route is therefore necessary for:

- Assessing the role and effectiveness of MPAs for cetacean conservation
- Improving knowledge and understanding of the ecology and conservation status of various marine mammal species
- Providing scientific information of practical relevance to regional conservation management



//OBJECTIVES

- Improving understanding of the population abundance; movement; habitat use and the genetic structure of the Indo-Pacific bottlenose dolphin (*T. aduncus*) and the Indo-Pacific humpback dolphin (*S. chinensis*) in the area
- Assessing the connectivity between MPAs in terms of cetacean movements in the study area and identifying cetacean feeding hotspots and associated areas of high ecosystem productivity
- Studying the vocalizations of different cetaceans present in the area throughout the year

This study uses several methods for achieving its objectives:



Bi-monthly boat surveys for two years to locate dolphins and conduct detailed observations. Animals are photographed and GPS coordinates, environmental variables, group size / composition and behaviour from each encounter is recorded.



Every second month aerial surveys are conducted (inshore and up to 3 nautical miles offshore) to search for the presence of animals.



An identification catalogue of bottlenose and humpback dolphins is being created based on both archived and new photos. Dorsal fin photo-identification allows individual dolphins to be identified by unique patterns and markings (e.g. fin deformities, unusual fin shapes, nicks, scratches, etc.)



DNA laboratory analysis of skin and blubber samples will improve understanding of the different groups of bottlenose dolphins present in the area throughout the year.

//MARINE MAMMAL ACOUSTIC MONITORING

The Department of Environmental Affairs (Branch Oceans & Coasts) has deployed three hydrophone elements in the area. Hydrophones are similar to microphones in air, but instead detect underwater sound. These instruments are constantly recording sounds from whales and dolphins that visit the area throughout the year.

This is part of a long term Passive Acoustic Monitoring Program (PAM) in the area. PAM is a cost-effective and non-intrusive method for obtaining important information about cetaceans.



You can listen to the sounds made by whales and dolphins as collected by the hydrophone at www.conserbio.org



We are looking for future sponsors to lend further support to this project. Please contact us for further information.

Lead Institutions:

Department of Environmental Affairs
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Project Coordinator:

Dr. Alejandra Vargas-Fonseca (DVM, MSc)

PhD Candidate, Department of Zoology,

Nelson Mandela Metropolitan University

ale@earthcollective.net