

Home Ranges and Foraging Ecology of White Sharks derived from Acoustic Telemetry

MSc (University of Pretoria) Project Overview, Oliver Jewell

Project Overview

Tracking movements and home ranges of white sharks in coastal areas is important not just for their conservation but also to understand how they may potentially interact with humans. An animals day to day movements reach an extent or boundary which can be referred to as its 'home range.' Within this 'home range' there may be core areas of habitat use, vital for the animals' life history. By establishing the white sharks home range in Gansbaai we will be able to see not just the extent of their movements but also which areas of the bay are important for them. In previous tracking studies, white sharks were also found to have distinct

swimming patterns which related to behaviours such as; hunting, patrolling, resting and travelling from one area to another. After completing a similar project in Mossel Bay, the aim of my masters and potential PhD project is to define and then compare home range and swimming patterns of white sharks in Gansbaai to white sharks in Mossel Bay. Once completed we will have a better understanding whether home range and swimming patterns are unique to one area (site specific) or whether distinct patterns of behaviour can be witnessed by many or perhaps all white sharks in the Western Cape.

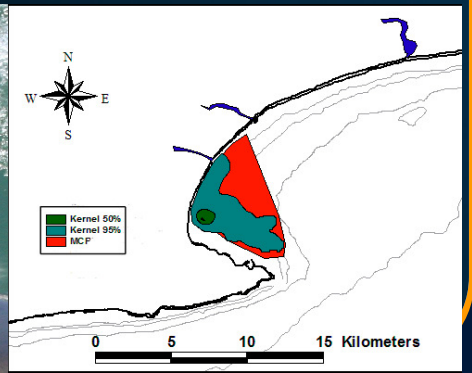
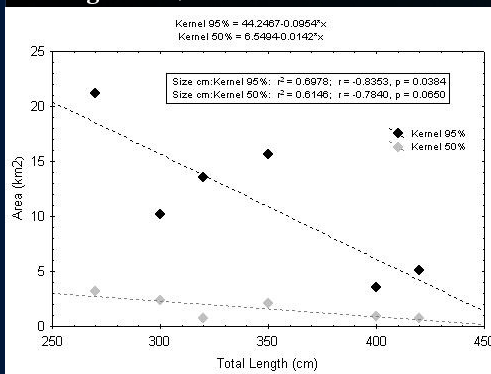


Figure 1 (left) Comparison between Total Length of white sharks and Home Range in Mossel Bay. Figure 2 (above) V16 Tag in place. Figure 3 (Right) Kernel and MCP methods establishing Home Range of a white shark in Mossel Bay. Figure 4 (right below) preparing to tag a white shark.

Aims & Hypothesis

What is the home range of white sharks in Gansbaai?

Do larger white sharks have more refined home range than smaller individuals? (Fig.1)

Can we observe similar swimming patterns to those observed in Mossel Bay (hunting at dawn and dusk, patrolling, resting and travelling)?

Methods

Our aims are to tag and manually track sharks in Gansbaai as part of an ongoing monitoring programme. Tagging will involve attracting sharks with bait and chum to our research vessel Lwazi where a Vemco V-16tp tag will be externally attached via tagging pole (Fig.2 & 4). Once the tag is in place the acoustic ping can be traced by our hydrophone and VR100 tracking box. Tracking involves following the shark for periods up to and exceeding 24hrs and will continue as long as conditions allow. The VR100 records the positioning, depth and surrounding water temperature of the shark. For the purpose of home range analysis we will use combined positions from each tracked shark and analyse with home range analysis on ArcView. Minimum Convex Polygon (MCP) and Kernel 95 & 50% methods will be used to define the overall home range and more focused areas within it (Fig.3). For foraging ecology and swimming patterns we will use extensive tracks of 3-5 white sharks tracked during winter months (April-August). These sharks will be tagged at Dyer Island and their interactions with the resident Cape fur seals documented. Are the white sharks of Dyer Island adopting different methods of attack on the Cape fur seals than those at Mossel Bay? We shall see...



Required	Cost
5xVemco V-16 tags	27,500
Tag attachments	750
Fuel	30,000
University Fees	20,000
Total	78,000

Oliver Jewell has been tagging and tracking white sharks extensively since 2008. He joined the Dyer Island Conservation Trust (DICT) in September 2009 and is currently conducting his MSc at University of Pretoria's Mammal Research Institute under the supervision of Prof. Marthán Bester and the collaboration of Ryan Johnson, Enrico Gennari (Oceans Research) and Alison Towner (DICT)

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Figures tacked from 'Home Range of White Sharks in Mossel Bay' Jewell, O. Johnson, R. Gennari, F. Bester, M & Oh, R.

