
**Multi species shark habitat use and migration
patterns in the Ponta do Ouro Partial Marine
Reserve**

Annual research report

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Executive Summary

We fitted 67 sharks with acoustic tags in the PPMR to investigate their habitat use, site fidelity and migration patterns. Tagged shark species included bull sharks (n = 34), tiger sharks (n = 18), grey reef sharks (n = 8), blacktip sharks (n = 6) and scalloped hammerhead sharks (n = 3). In addition, we deployed satellite tags on tiger sharks (n = 18) and bull sharks (n = 25) to investigate their habitat use outside of the acoustic receiver array. Many of these sharks showed high fidelity seasonal habitat use in the PPMR with the majority of sharks present in the PPMR during the summer months. Between periods of residency in the PPMR tagged sharks undertook largescale migrations as far as Madagascar, northern Mozambique and the western Cape in South Africa. Additionally, almost all sharks tagged in the PPMR crossed the border into South Africa multiple times highlighting the importance of the neighboring iSimangaliso Wetland Park and the need for cooperative transboundary management of the marine environment. In summary, the PPMR is clearly an important habitat for multiple species of top predatory sharks which reflect a healthy marine ecosystem. This supports the designation of the PPMR as a key marine protected area for Mozambique and neighbouring South Africa and emphasizes the need for continued protection and effective management of the PPMR.

Shark tagging

Table 1. A summary of the species and number of sharks tagged with acoustic tags (VEMCO V16) and satellite tags (Wildlife Computer SPOT or miniPAT tags) in the PPMR.

Common name	Scientific name	Number tagged	Tag type
Bull shark	<i>Carcharhinus leucas</i>	34	Acoustic and satellite
Tiger shark	<i>Galeocerdo cuvier</i>	18	Acoustic and satellite
Grey Reef shark	<i>Carcharhinus amblyrhynchos</i>	8	Acoustic
Blacktip shark	<i>Carcharhinus limbatus</i>	6	Acoustic
Scalloped hammerhead shark	<i>Sphyrna lewini</i>	3	Acoustic

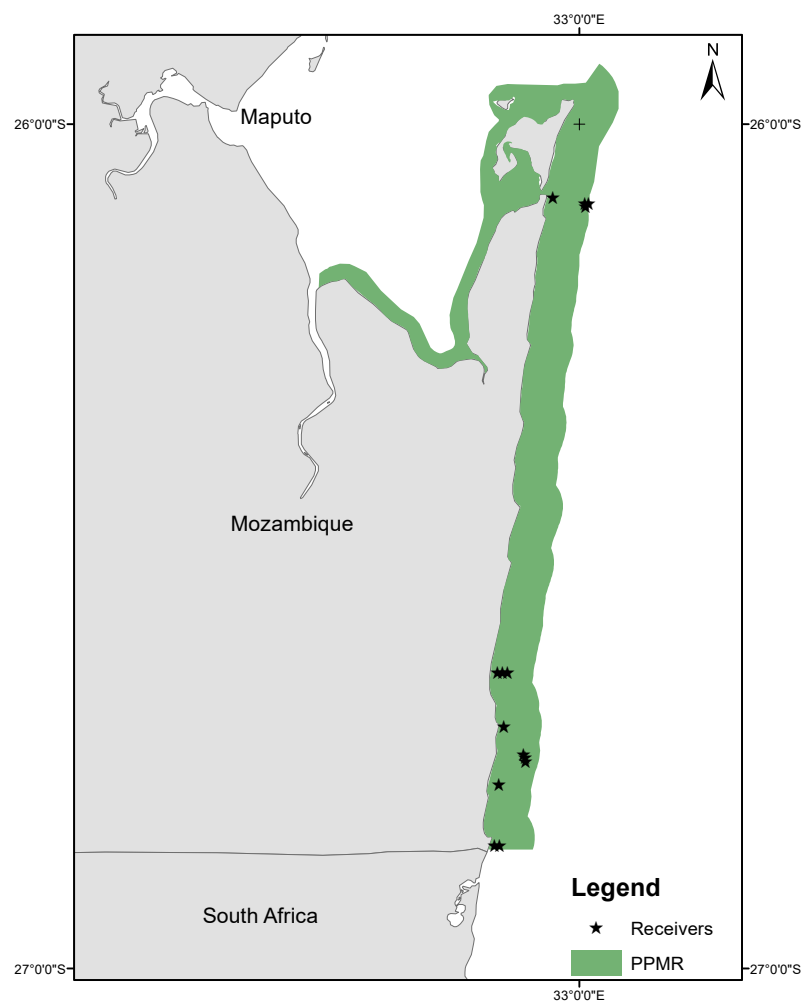


Figure 1. Receiver locations in the PPMR. The receivers (VEMCO VR2W) detect the tagged sharks as well as any other tagged species that swim past the receivers.

Seasonal shark presence in the PPMR

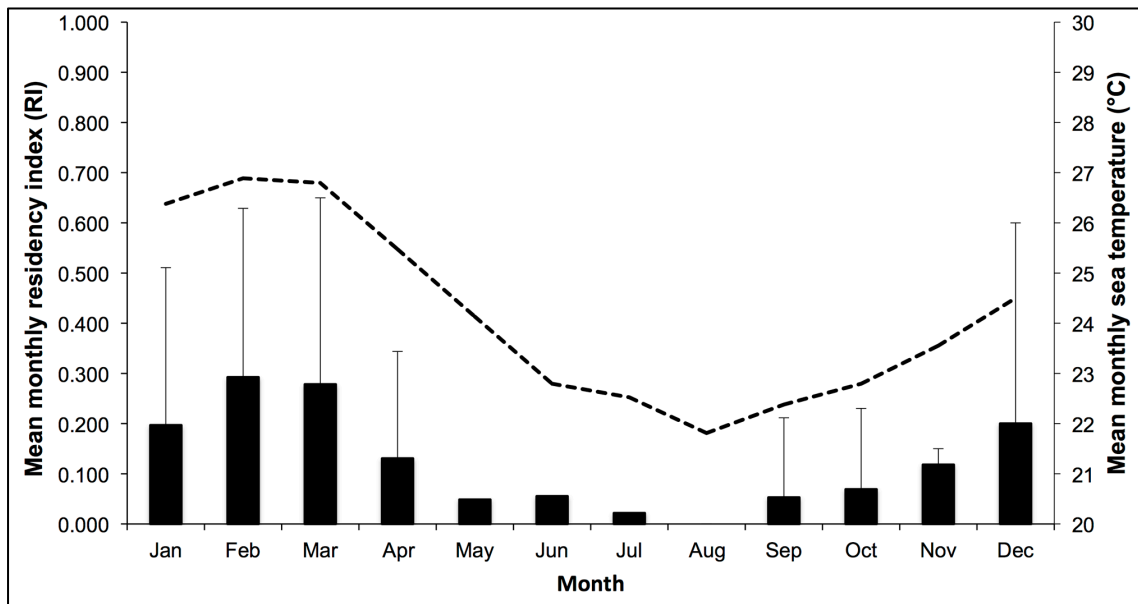


Figure 2. Seasonal residency for tagged bull sharks in the PPMR. Bull shark residency is highest in the PPMR between November and May each year.

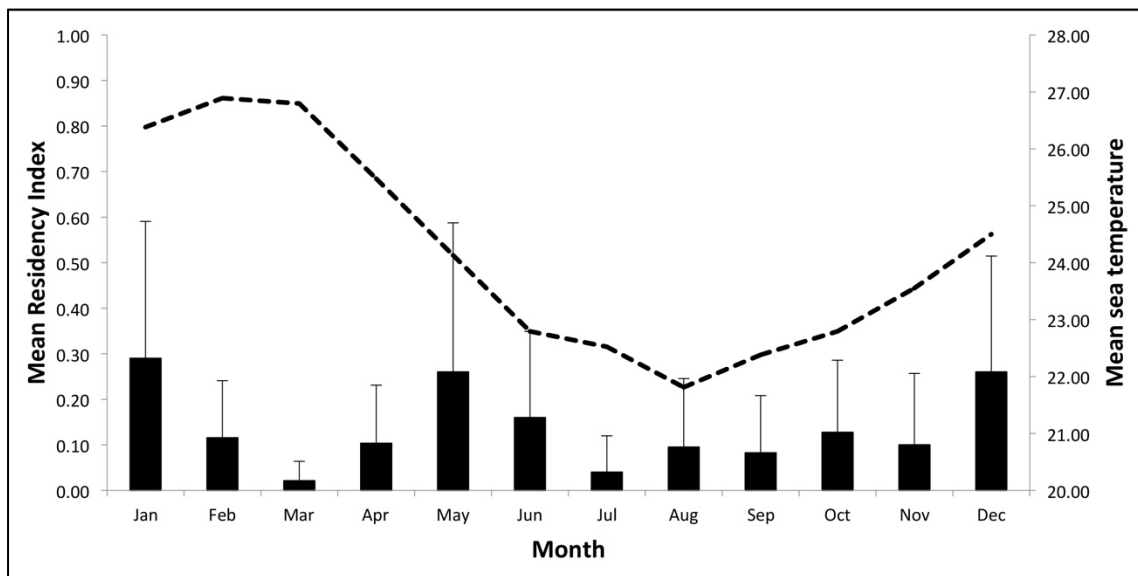


Figure 3. Seasonal residency for tagged tiger sharks in the PPMR. Residency is lowest during March when many tagged sharks migrate southwards into South Africa at the peak of summer. Mean monthly residency peaks in December and January and again in May and June.

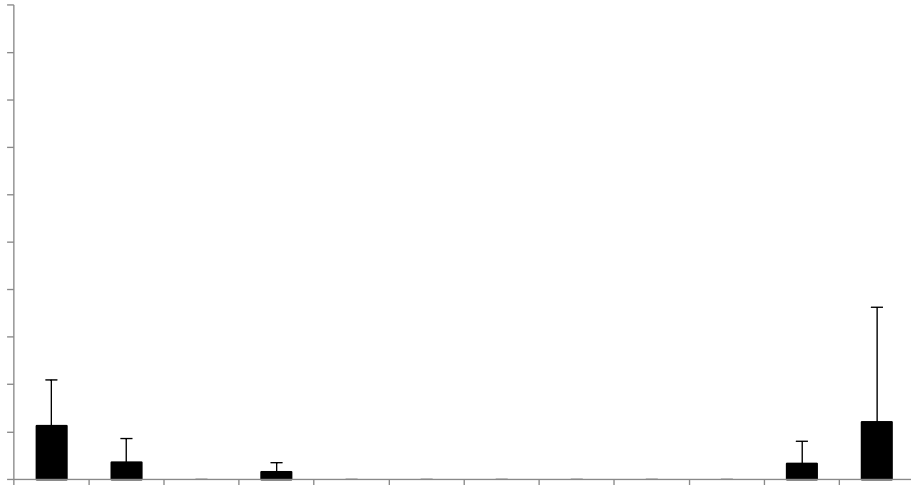


Figure 4. Seasonal residency for tagged blacktip sharks in the PPMR. The presence of blacktip sharks appears to occur only in summer each year between November and April. However, further investigation is needed to confirm this.

Data for the remaining tagged species (grey reef and scalloped hammerhead shark) are yet to be downloaded from the receiver array in the PPMR. However it appears that the northern section of the PPMR is particularly important for grey reef sharks and increased monitoring effort in the north should provide more data.

Sharks and fisheries

On March 11th we tagged a 1.8m mature female grey reef shark in the PPMR offshore of Santa Maria. This shark was subsequently caught in September by a small scale semi-commercial fishermen from Maputo who captured it off the lighthouse north of Inhaca. Although it was not possible to know if the shark was caught in the boundaries of the PPMR, it certainly highlights the risks that sharks in the PPMR face from nearby fishing pressure. The PPMR remains an important sanctuary for sharks in the region and the continued enforcement of regulations that protect sharks from being caught are necessary.

Importance of PPMR for sharks

The PPMR is an exceptionally key habitat for many species of sharks that utilize the area over different periods of the year. Two species of sharks in particular (bull sharks and tiger sharks) appear to spend a lot of time in the PPMR. The presence of such top predatory sharks are signs of a healthy marine ecosystem and highlights the importance of the habitat within the PPMR. In particular, the PPMR appears to be an especially important area for tiger sharks in the region (Fig X). Tiger shark hotspots such as the PPMR may indicate areas of especially high diversity and productivity and as such may be used to prioritize areas for conservation. Indeed, in dynamic marine environments with spatially and temporally fluctuating resources, it can be useful to use mobile top predators to identify key habitats and ecosystems. In summary, this highlights the importance of the marine environment within the boundaries of the PPMR and its continued conservation management should remain a priority. Future conservation management plans should also aim to expand the boundaries of the PPMR offshore to encompass additional habitat adjacent to the PPMR.

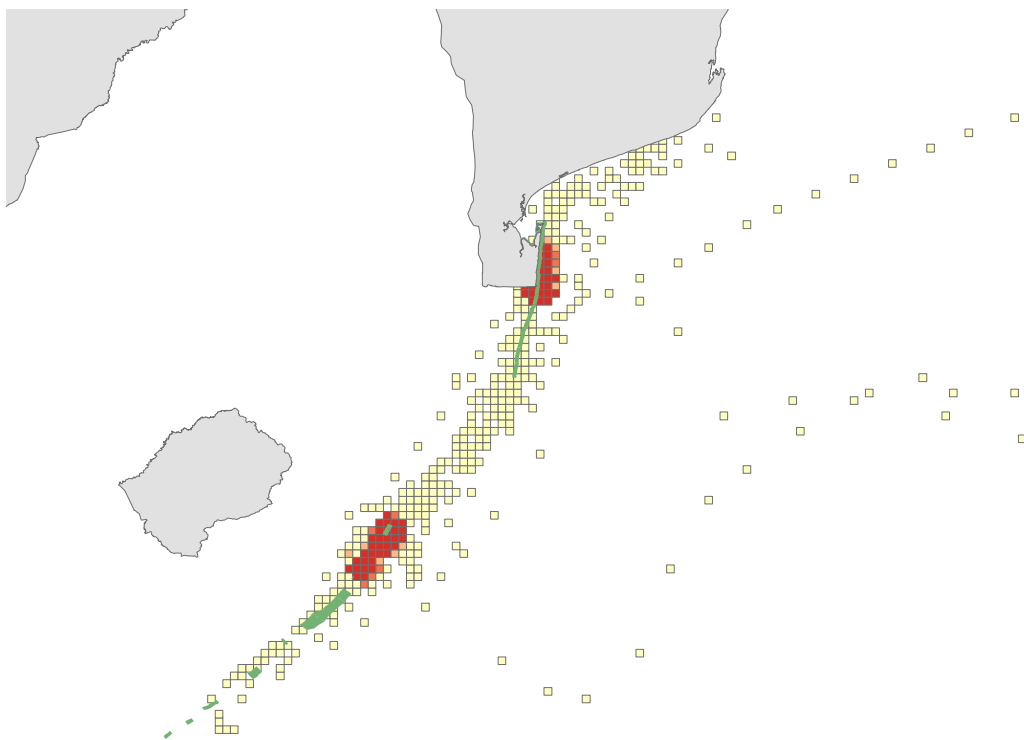


Figure 5. A map of tiger shark habitat use from sharks fitted with satellite tags in the PPMR. It is clear that the PPMR is an area of key habitat use for tiger sharks as can be seen by the hotspot (red squares) located in the PPMR and neighbouring iSimangaliso Wetland Park. Conservation of the marine environment within the PPMR boundaries should continue to be

prioritized and future conservation management plans should consider expanding the boundaries of the PPMR.