

## Tracking The Sicklefin Lemon Sharks In Curieuse Marine National Park (CMNP)

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### **Submission: Background**

Curieuse Marine National Park (CMNP), designated in 1979, is 2.9km<sup>2</sup> and located north of Praslin Island and a key tourism site in the inner islands. The island is surrounded by a shallow fringing reef and seagrass beds and has a healthy stand of mangroves. These habitats serve as key sea turtle feeding and nesting grounds as well as providing nursery habitat for key ecological species such as Sicklefin lemon shark (*Negaprion acutidens*).

The *N. acutidens* is categorized as vulnerable on the IUCN Red List of Threatened Species, in part due to its coastal preference and consequent proximity to human activity, and it faces many threats to its continued survival. This species is fished throughout its range, with addition to its small habitat range and limited movement patterns, makes it susceptible to local depletion since dispersal is restricted. For effective protection of shark species, it is important to gain an understanding of spatial movements and habitat preferences of critical life stages.

The acoustic receiver array that was installed in 2019 along the north and east coast of Curieuse Island, together with the acoustic tagging of 20 neonates, that was funded by the Seychelles Climate Change and Adaptation Trust (SeyCCAT) will enhance knowledge of *N.acutidens* spatial ecology.

### **Method**

The core of the tracking project is an array of 12 acoustic receivers located on the east coast of CMNP installed at specific locations underwater, in known habitat frequented by neonate *N. acutidens*.

With six receivers placed in shallow locations and six positioned in deeper water, the receivers automatically detect ultrasonic coded pings from transmitters surgically implanted into sharks. The array is designed to capture detailed movement patterns of the species in their usual range with the shallow receivers, and detects any movement towards the boundary of the national park to the east with the deep receivers.

A total of 20 individuals were selected for surgical implantation of transmitters, based on their apparent health and stress levels. Following workup individuals once caught were first transferred to a separate water filled trough and inverted to induce tonic immobility. For the insertion of the transmitter, a small incision with a scalpel is made in the ventral side in the posterior third of the body cavity. Incisions were then closed with three sutures before being released and monitored to ensure recovery. At all times stress levels were monitored, and water in the trough frequently refreshed to

maintain oxygen levels. The entire process for each shark was completed in five minutes or less.

## **Results**

Preliminary results so far show a total of 329,208 detections from transmitters implanted in the 20 sharks, between the October 2019 and May 2020. Of the total detections, only 1,203 detections were recorded on receivers placed in deeper water, suggesting a very strong preference for shallow water habitats. At least four individuals appear to remain active within range of the receivers, which broadly correlates with observed capture rate patterns during PIT tagging surveys. Additional data was collected during 2020 and April 2022, and is yet to be analysed.

## **Conclusion**

Implementation of the project has proceeded as planned, with acceptable positioning of receivers, and high apparent survival of neonates implanted with transmitters. First retrieval of receiver data was conducted in May 2020, and the concluding retrieval of data is planned for May 2022.

Results from this project will enable MPA practitioners to make informed future recommendations with regards to the protection of this particular species. The overall outcome of this project will be a greater understanding of the movements of juvenile *N. acutidens* within CMNP and the efficacy of the park size in their protection.