



## Elasmobranchs survey in the Mascarene Archipelago (La Réunion, Mauritius, Rodrigues): creation of an observatory to improve scientific knowledge

Estelle Crochelet, Nadeem Nazurally, Laure Inçaby, Océane Desbonnes,  
Geoffrey Bertrand, Natacha Nikolic

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# Elasmobranchs survey in the Mascarene Archipelago (La Réunion, Mauritius, Rodrigues): creation of an observatory to improve scientific knowledge

Crochelet E. (1), Nazurally N. (2)\*, Inçaby L. (1)\*, Desbonnes O. (1)\*, Bertrand G. (3) and Nikolic N. (1, 4).

(1) Agence de Recherche pour la Biodiversité à La Réunion - (2) University of Mauritius - (3) Travaux Sous-Marins Océan Indien (TSMOI) - (4) INRAE. (\*) equal contribution

## Abstract

Several species of rays and sharks evolve in the waters of the Mascarene archipelago (La Réunion, Mauritius, Rodrigues) but they remain little known. To compensate this lack of knowledge, the Mascarene Archipelago Elasmobranch Observatory (MAEO) has been created in 2021 to collect data on elasmobranchs biodiversity and distribution. It combines non-invasive sampling methods (360° cameras and UVCs) and a sighting network. A total of 412 sightings of 994 individuals including 18 species of elasmobranchs were recorded from large time scale sightings (2012-2022).



Fig 1. *Rhincodon typus* - Mauritius

First results revealed that species are different depending on the island and bring out the existence of some preferred areas, particularly on the West coasts of La Réunion and Mauritius. Future analysis in the context of MAEO will go in deeper to understand the link with environmental parameters and help to implement actions for their conservation and management.

## Introduction

Along with Madagascar, Comoros and Seychelles, the Mascarene archipelago is one of the main biodiversity hotspot of the Western Indian Ocean (Myers *et al.* 2000). As a result its biodiversity is very important but threatened by anthropogenic activities (Mauremootoo *et al.* 2003; Letourneur *et al.* 2004). 59 species of rays and sharks have been identified in the archipelago: 15 rays and 44 sharks, among which more than 60% are threatened with extinction. The lack of knowledge of these populations makes conservation measures difficult to establish. To fill this gap, the Mascarene Archipelago Elasmobranch Observatory (MAEO) has been created in 2021. It is the first scientific and educational project on elasmobranchs overall Mascarenes. Through the set-up of a sightings network and *in-situ* sightings, it provides updated data on the biodiversity of elasmobranchs and their spatial and temporal distribution. Several actions of sensitisation are also implemented for wide audience and school children to communicate on elasmobranchs biology and ecology, and their ecosystems around the Mascarene archipelago.



Fig 2. School sensitisation workshop: more than 230 children from 5 to 11 years old have already benefited from these workshops



## Sighting network

An online platform has been created: it allows sea users to record their sightings of rays and sharks as well as biological and environmental parameters.

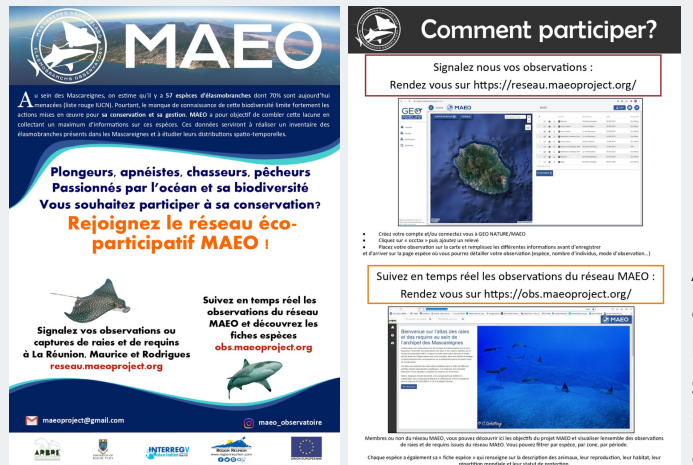


Fig 3. Sighting network flyer

## Methodology

### Example online:

- Date
- Location & details
- Species name
- Number
- Biology (sex, maturity stage, activity)

A second website allows viewing the latest elasmobranchs sightings and also information about species.

## Cameras and UVC

Field campaigns at sea are organized around La Réunion, Mauritius and Rodrigues islands. During 60 min, 360° recording cameras are deployed between 10 and 60 meters depth and Underwater Visual Census (UVC) of 30 min are led by divers.



Fig 4. 360° cameras



Fig 5. Underwater Visual Census (UVC)

## Conclusion

**19 elasmobranch species** have been recorded so far in the Mascarene archipelago: 8 rays and 11 sharks. This represents **31% of the Mascarenes elasmobranch species**. The set-up of this observatory is a real success considering the number of records in the database in such a short time. Moreover, sightings have been crossed with environmental parameters in a **study in progress** and some of them seem to play a role in the abundance of species. Finally, this scientific and educational project shows the benefit of working in **collusion with citizens** (participatory science).

## Results

Huge number of geographic locations around the islands has been explored (48 sites). A total of 116 cameras records and UVC have been carried out at La Réunion (26 sites), 57 at Mauritius (14 sites) and 11 at Rodrigues (8 sites). Considering records from cameras, UVC, and the sighting network, 323 elasmobranchs were detected at La Réunion (8 rays and 9 sharks species), 83 sightings at Mauritius (6 rays and 5 sharks species), and 6 sightings at Rodrigues (2 rays and 1 shark). Results show that observed species and specific diversity depend on the area. The western coast of La Réunion as well as northern and western Mauritius costs are the most suitable areas to observe elasmobranchs. Some ray species as *Aetobatus ocellatus*, *Taeniura meyeni*, and *Pateobatis fai* are very common in the archipelago. Conversely, sharks are less frequently observed and differently recorded depending on the island: reef sharks as *Triaenodon obesus* and *Carcharhinus amblyrhynchos* are more observed at Mauritius, while bigger sharks as *Carcharhinus leucas*, *Galeocerdo cuvier*, and hammerheads (*Sphyrna spp.*) are more present at La Réunion. Moreover, sightings of some species as *Mobula* rays, *Carcharhinus longimanus* and *Rhincodon typus* are uncommon and punctual in the Mascarenes.

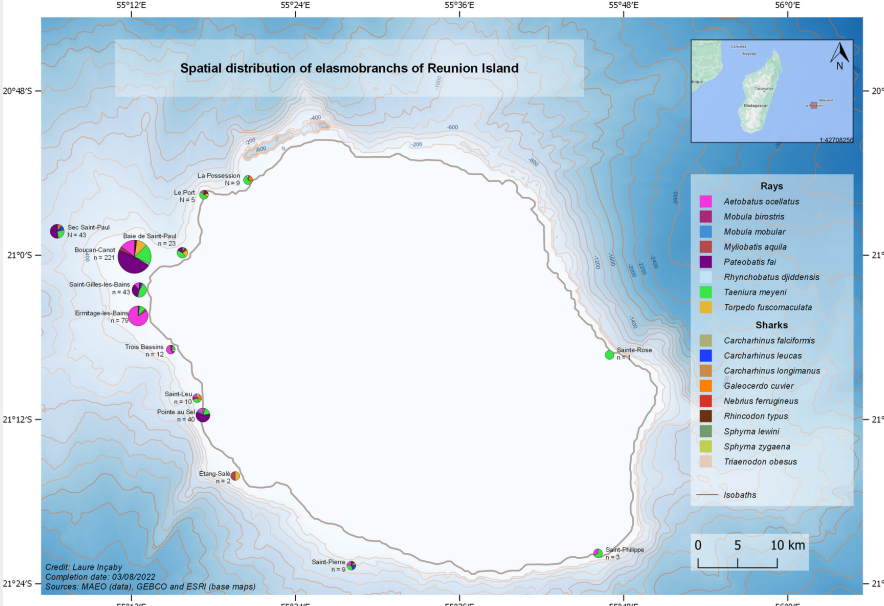


Fig 6. Distribution of elasmobranchs around La Réunion

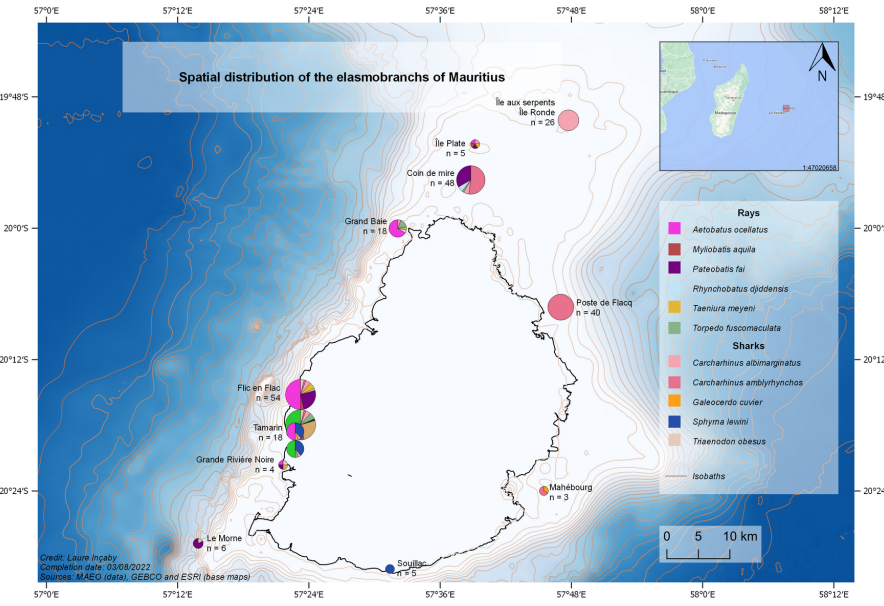


Fig 7. Distribution of elasmobranchs around Mauritius



Fig 8. *Aetobatus ocellatus* - La Réunion



Fig 9. *Rhincobatus djiddensis* - Mauritius

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