

Scientific Expedition Report

Ti Whale An Nou program 2024



Sperm whale (*Physeter macrocephalus*), Sint Maarten.

Expedition date: 13th-23rd August

Expedition number: 6th of 2024

Islands monitored : Sint-Maarten, Saba, Sint-Eustatius, Saint Kitts and Nevis, Montserrat

Project Yon Sèl Vwa Pou Baleyn

This project has been funded by the Regional Cooperation Fund (FCR) of the Prefecture of Martinique. It aligns with the FCR's objectives to strengthen regional cooperation and support environmental and biodiversity protection.

The Yon Sèl Vwa Pou Baleyn project aims to enhance cooperation among the French islands, the Organization of Eastern Caribbean States, and the Dutch territories. Its general objectives include fostering collaboration across the northern and central Caribbean as well as addressing gaps in knowledge about marine mammals and supporting their conservation. The project also seeks to strengthen regional capacity by developing skills, promoting responsible conservation policies, and building networks among stakeholders. It is part of the Ti Whale An Nou program initiated by the Caribbean Cetacean Society.

The project reaches the objectives through research expeditions that contribute to the collection of critical data on cetaceans, improving our understanding of their ecology, the threats they face, and the conservation measures needed for their protection. It supports long-term monitoring efforts while enhancing the technical skills and knowledge of local stakeholders in cetacean monitoring and identification. Importantly, the project fosters regional capacity building by connecting professionals and interested individuals, involved as crew members, creating an inter-island network dedicated to the conservation of cetaceans, marine ecosystems, and biodiversity.

The Ti Whale An Nou program

Meaning “our own little whales” in a creole mix, Ti Whale An Nou (<https://www.ccs-ngo.com/ti-whale-an-nou?lang=fr>) is a program started in 2021 focusing on cooperation, research, education and conservation of whales and dolphins. It is the largest scientific survey dedicated to obtaining essential information for conservation of cetaceans in the Caribbean region. It is a locally driven initiative led by Caribbean people, ensuring its longevity in our regions.

A minimum of 33 species of cetaceans have so far been documented in the Caribbean region, which is more than a third of the species known in the world.

The goal of each expedition is to address the lack of knowledge throughout the Caribbean region regarding the diversity, distribution, relative abundances and movement patterns of cetacean species, as well as learning about the threats they face. The missions have welcomed participants from all islands in the region to participate in training, building local capacity and experience in the field.

During the months of March to September of 2024 , six scientific expeditions of 15 days are programmed throughout all the islands of the Lesser Antilles. Each expedition starts in Martinique and expeditions are grouped by regions: North (Montserrat - Anguilla), Center (Martinique - Guadeloupe) and South (Grenada - Saint-Lucia).

This report is focused on the sixth expedition of the year which took place in August along the islands of Sint-Maarten, Saba Sint-Eustatius, Saint Kitts, Nevis and Montserrat. The crew consisted of representatives from Martinique, Bonaire, Antigua, Trinidad y Tobago, Grenada, Saint-Martin and Sint-Maarten. This diverse crew was composed of conservationists, marine rangers at Sint-Maarten Nature Foundation, passionate people involved in local ocean initiatives and members of the Guadeloupe National Park.

List of crew and affiliation

Expedition leader :

- **Lucas Bernier:** Marine biologist and project manager for the CCS in Martinique.

Scientific observers :

- **Laurent Louis-Jean:** Natural reserved conservationist at the Regional Natural Park of Martinique (PNRM)
- **Gwenaëlle Margez:** Yoga teacher in Bonaire. Collects dolphin Photo-identification data from the coast in Bonaire.
- **Manon Jover:** Volunteer at the Administrative department of environment, territory development and housing in Saint-Martin (DEAL).
- **Titouan Grancher:** Marine Ranger at Sint-Maarten Nature Foundation.
- **Joshel Wilson:** Wildlife officer at Environment Awareness Group (EAG) in Antigua. From Grenada.
- **Miquel Garcia:** Marine project manager at Environment Awareness Group (EAG) in Antigua. From Trinidad.

Captain :

- **Delhon Hewitt:** Skipper in Sint-Maarten.



Standardized scientific protocol

During our surveys, acoustic detection with a towed hydrophone array was combined with visual observations from at least two observers on deck, allowing both methods to complement each other for effective cetacean presence / absence monitoring. This protocol is the same applied in all the islands of the Lesser Antilles since 2021 and may be applied in other islands of the Caribbean over the next years for better regional cooperation.

Survey Protocol

The visual observer effort was limited by daylight, from 06:00 to 18:00. Boat tracks were decided by the scientific expedition leader the day before, taking into consideration the weather conditions, the navigation time and the target arrival point. The crew was divided into three teams of at least two people. Each team performed a different role, which changed every two hours in the following order: (1) data entering, (2) visual observation, and (3) logistical support and resting.

Data Entering

During the expedition, two crew members used the ObsEnMer software (altitude creation company, release 3.08) in expert mode on an iPad 8th generation. The use of this software made it possible to record, in real time, the location of the boat during the survey and to locate every data point in space and time. Every hour, on the hour, from the beginning of the survey effort, the environmental conditions and the maritime traffic were recorded, as well as an acoustic point when the hydrophone was towed. Firstly, in situ environmental parameters are recorded in order to monitor and control the detection probability of cetaceans, as certain conditions may limit the detection of species at the surface. Secondly, vessel presence or absence is recorded, as well as the numbers and types of vessels, for a future co-occurrence study between cetaceans and maritime traffic. Lastly, each hour an acoustic point sample is conducted. During an acoustic point, biological and anthropogenic information was collected to determine the quality of the recordings, the intensity of the anthropogenic noise and the presence of certain characteristic species. An acoustic point was defined with ten minutes of at least two people listening with

headphones. While listening, the team would also try to visually identify any cetacean vocalization by observing the spectrogram and/or the click detector module on the screen using PAMGuard software version 2.02.07 (Gillespie et al., 2008).

Visual observations

During the daylight effort, two observers were placed at the front of the boat on either side of the mast in order to have the highest position without being hindered by the sails. Each observer covered an observation angle between 0° and 90° on each side, considering 0° the front of the boat. They observed the environment between these two angles and between the boat and the horizon. Their objective was to detect cetaceans by direct identification (e.g., dorsal fin, fluk , blows, breach) or to locate indicators that could potentially indicate the presence of cetaceans (e.g., splash, group of birds)

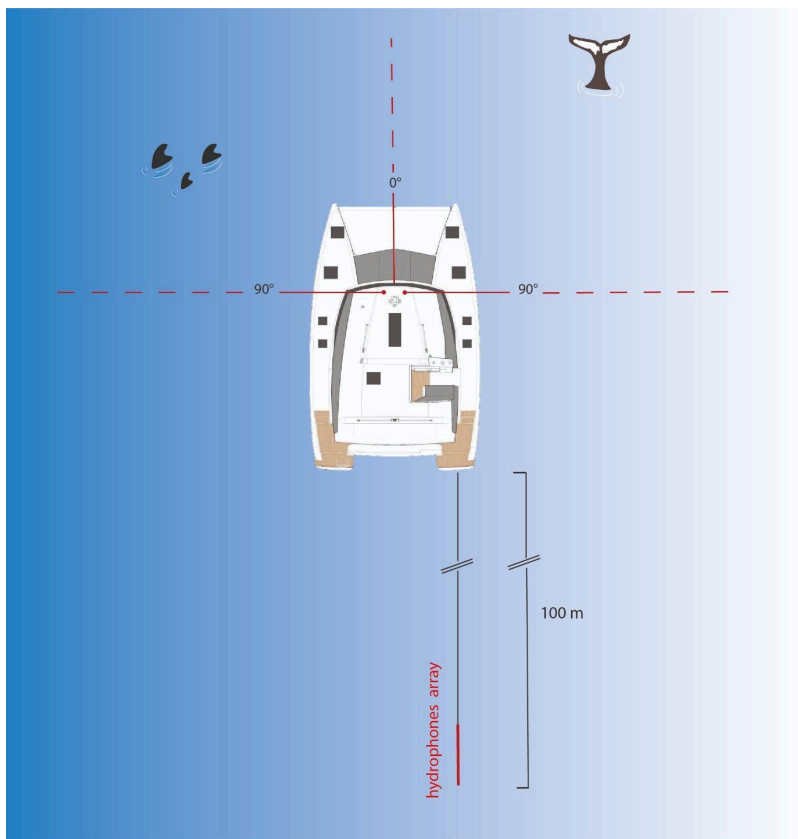


Figure 1: Layout of the research vessel and the area observed during the effort.

Logistical support

The team who were neither observing nor collecting data served as logistical support. They were responsible for several tasks: launching or removing the hydrophone, keeping watch on the maritime traffic to avoid boats crossing the path of the hydrophone and preparing the cameras so that they were available for photo identification when cetaceans were detected.

Acoustic Monitoring

During the survey, whenever possible, a towed hydrophone array was used to detect cetacean vocalizations and clicks. The hydrophone was towed by the boat at a distance of 100m and deployed when the waters were at least 50m deep and with no more than moderate vessel traffic. The array is connected to a Data Acquisition Unit and a laptop with PAMGuard software. The PAMGuard software allows us to monitor cetacean vocalizations not only in real time, but also to inspect and confirm the detections and species offline after the survey.

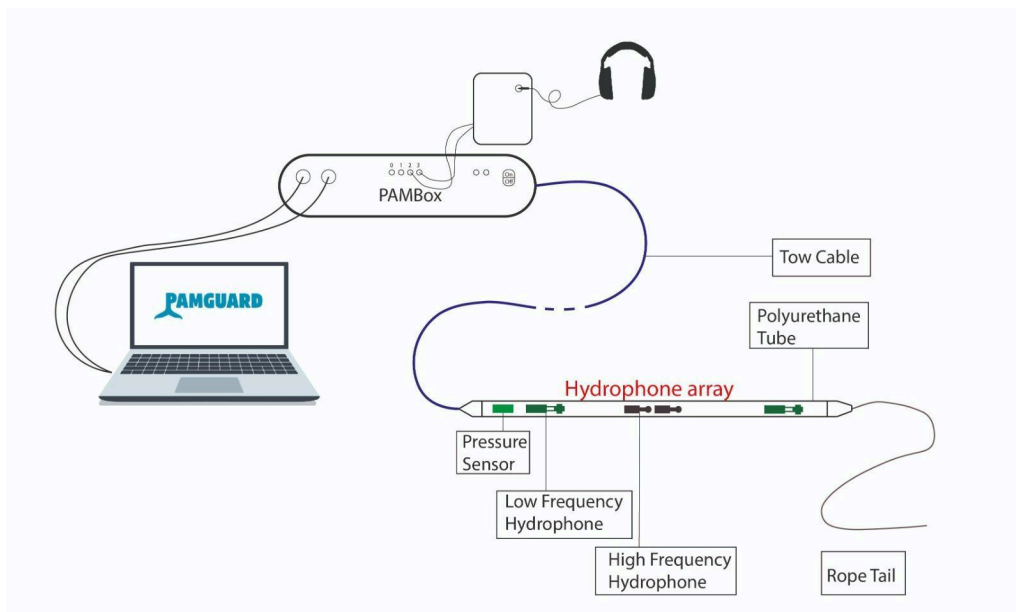


Figure 2: Diagram of the Acoustic Configuration

When cetaceans were visually detected, the observer signaled the presence of the animal(s) to the crew and continued the observation. The expedition leader would evaluate if the observation marked the start of a cetacean survey, where additional information such as photo-identification pictures would be collected. In either case, we recorded the GPS position at the time of the observation and entered the following data: identification of the species, distance to sighting, direction of individuals, estimated number of individuals, estimated number of juveniles and number of boats around the group.

If the decision was made to collect additional information, the logistics team would then undertake photo-identification. To do this, three cameras were used across the surveys: a Canon 5D, a Canon 90D and a Sony A7RIV with a 70-300 mm and 100-400 mm lens. The objective was to take photos of the underside of the fluke for humpback whales and sperm whales and the dorsal fin for all other species. Approach of the animal would always be done with respect.

RESULTS

During Expedition 6 of 2024, 2 cetaceans species were monitored. The studied species include the Bottlenose dolphin (*Tursiops truncatus*) and Sperm whale (*Physeter macrocephalus*). 136 hours of research effort were conducted over an 8 day expedition monitoring from Sint-Maarten to Montserrat. The visual and acoustic effort covered 450 km, with an average of 56 km covered per day at an average speed of 5.0 knots, depicted by the blue lines in Figure 3 below.

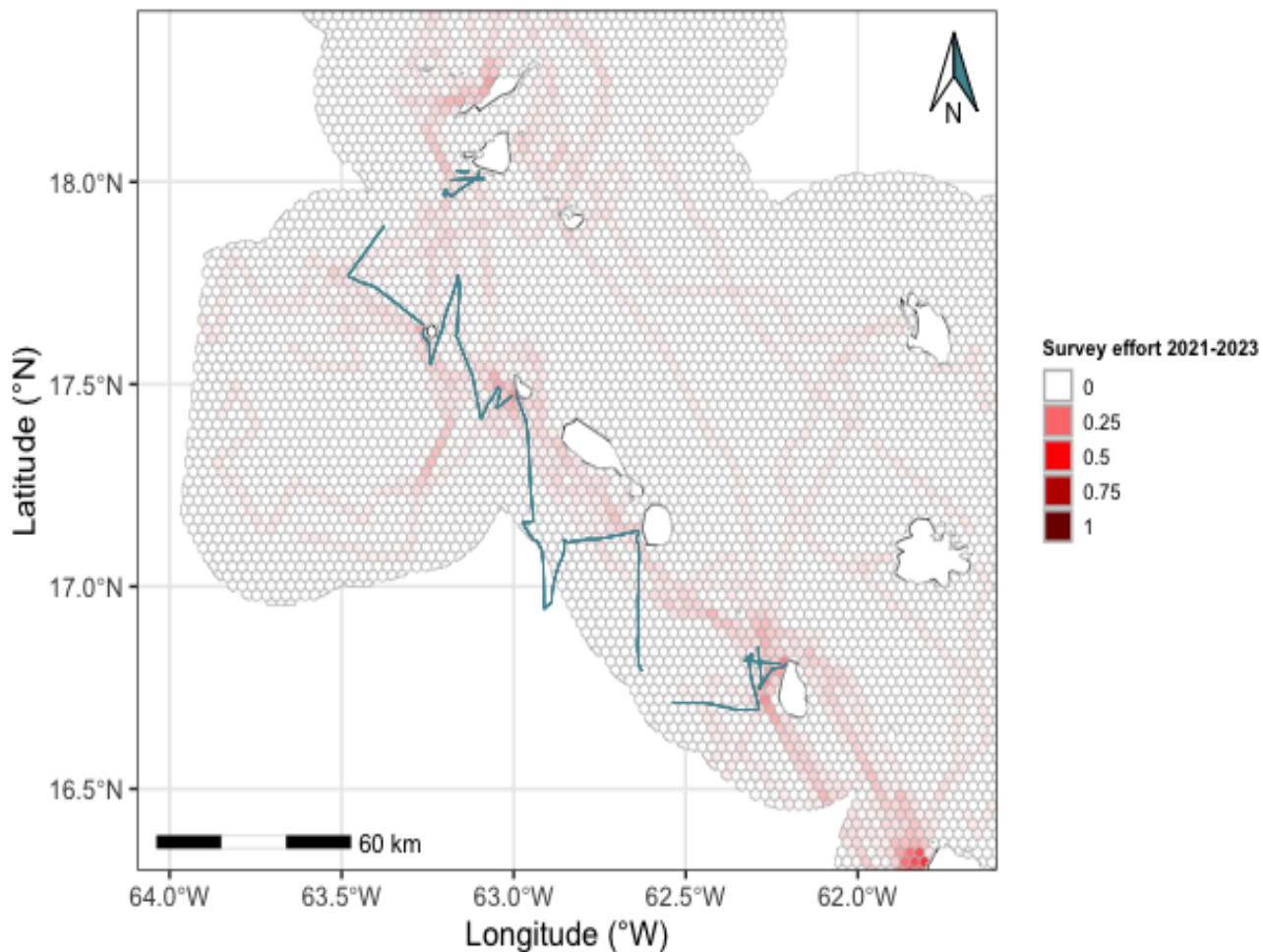


Figure 3: Track of boat surveys effort of expedition 5 of 2024

During the surveys, research effort was balanced as much as possible between unexplored and well surveyed areas (Figure 3) to improve the research coverage while allowing comparison with previously collected data.

Cetacean Species monitored

- Bottlenose dolphin (*Tursiops truncatus*)
- Sperm whale (*Physeter macrocephalus*)

Cetaceans sightings table :

Table 1: Cetacean sightings recorded during expedition 6 of 2024.

Localization	Species Name	Identification certainly	Estimate	Max. estimate	Min. estimate	Juv. presence	Juv. estimate
Sint-Maarten	Sperm whale	Certain	9	10	8	Yes	3
Montserrat	Sperm whale	Certain	3	4	3	No	0
Montserrat	Bottlenose dolphin	Certain	7	8	6	Yes	1



Sperm whale (*Physeter macrocephalus*)

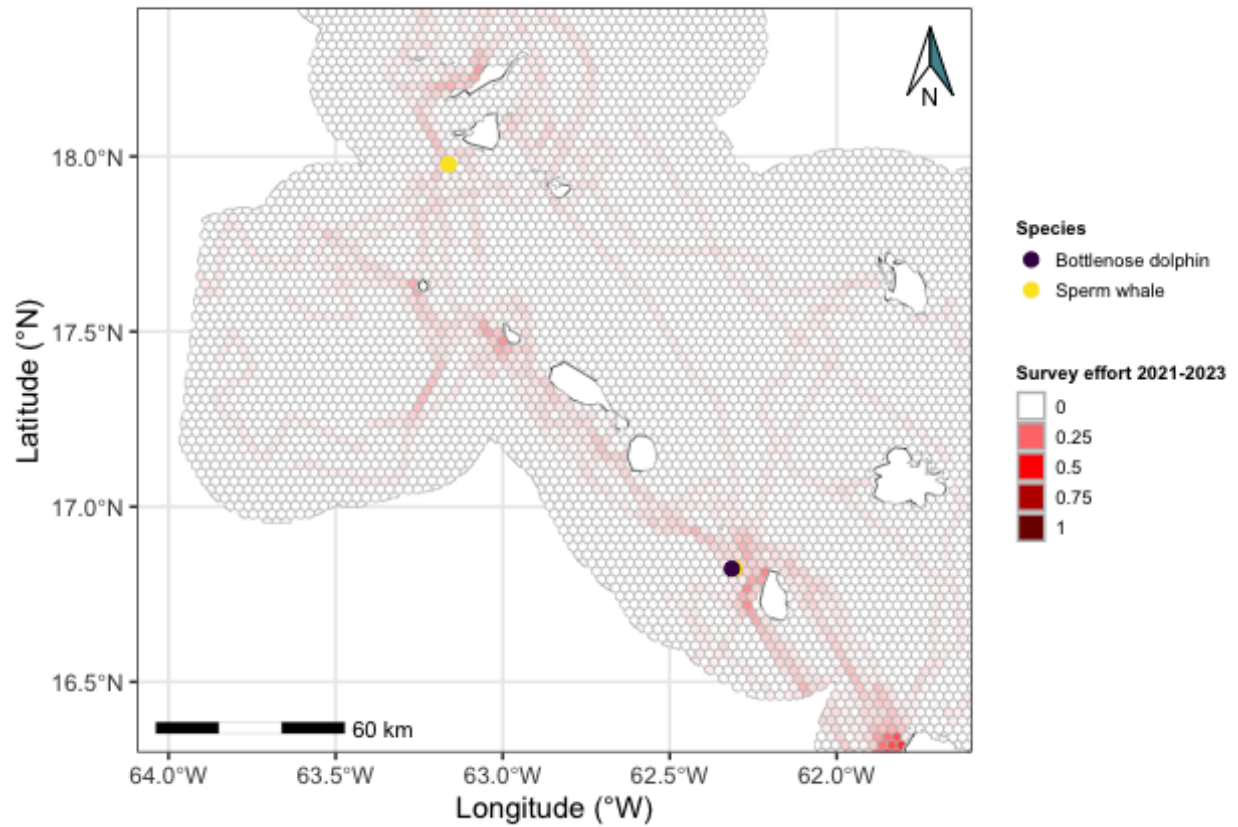


Figure 4: Map of the confirmed cetacean sightings with survey effort depicted in red shading for 2021-2023

Hydro acoustic sightings :

During this expedition, 47 listening points were conducted with active listening while the hydrophone was towed, representing a total of at least 8 hours of listening. Of these, 12 featured the presence of cetaceans. 7 detections were of Delphinidae and 5 of sperm whales. Species detection was based on listening and visual detection using the spectrogram and click detector of the PAMGuard software for potential whistles, clicks, songs, and other characteristic sounds of certain cetacean species. They are each recorded and depicted in Figure 5 below.

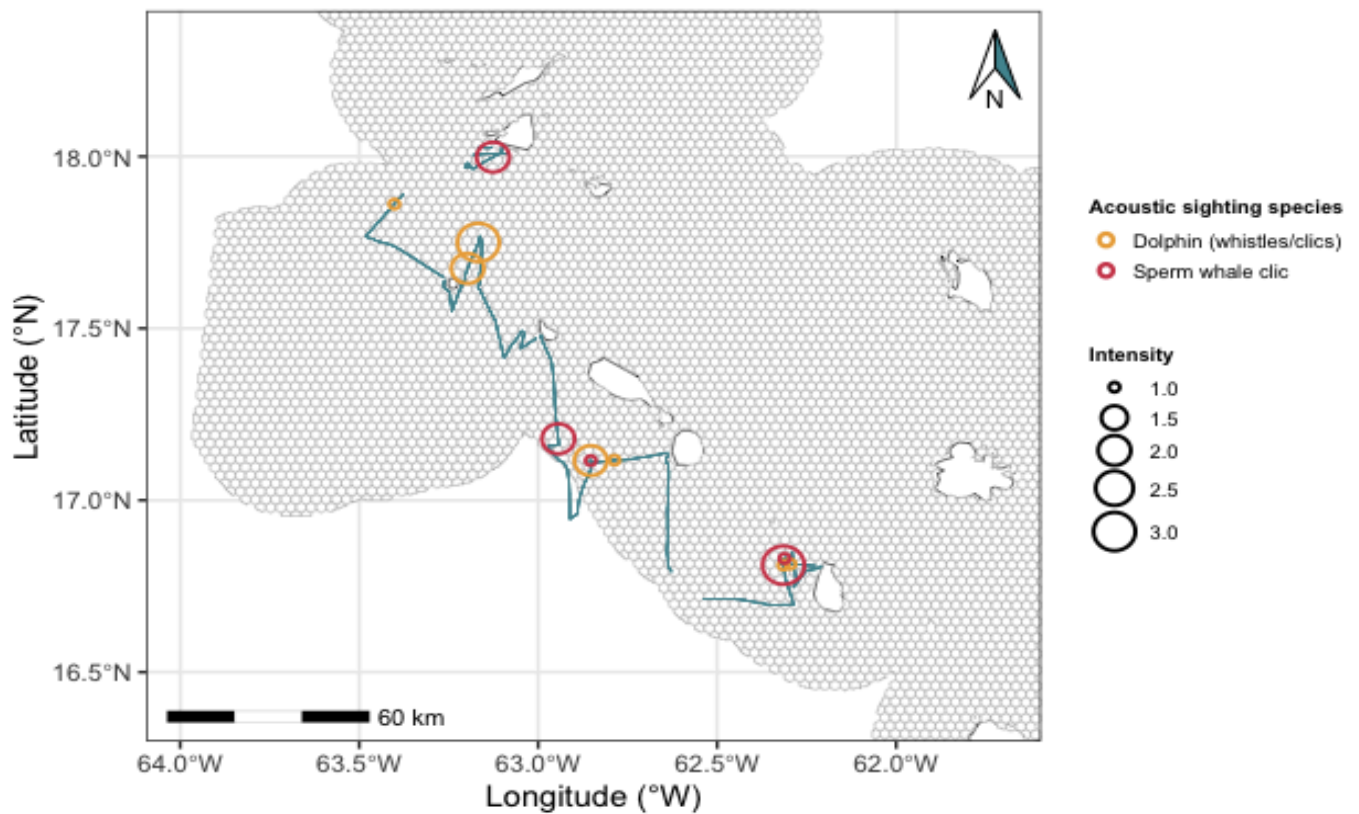


Figure 5: Study area of the acoustic sightings of Delphinidae whistle and clicks (orange circles), and sperm whale click (red circles). The active acoustic survey is represented by the blue line.

Marine traffic :

A total of 24 boats were observed during the visual survey of this expedition (Fig. 6.1), with large boats accounting for the majority (40% of observations) clustered between Sint-Eustatius and Sint-Maarten (Fig.6.2 C).

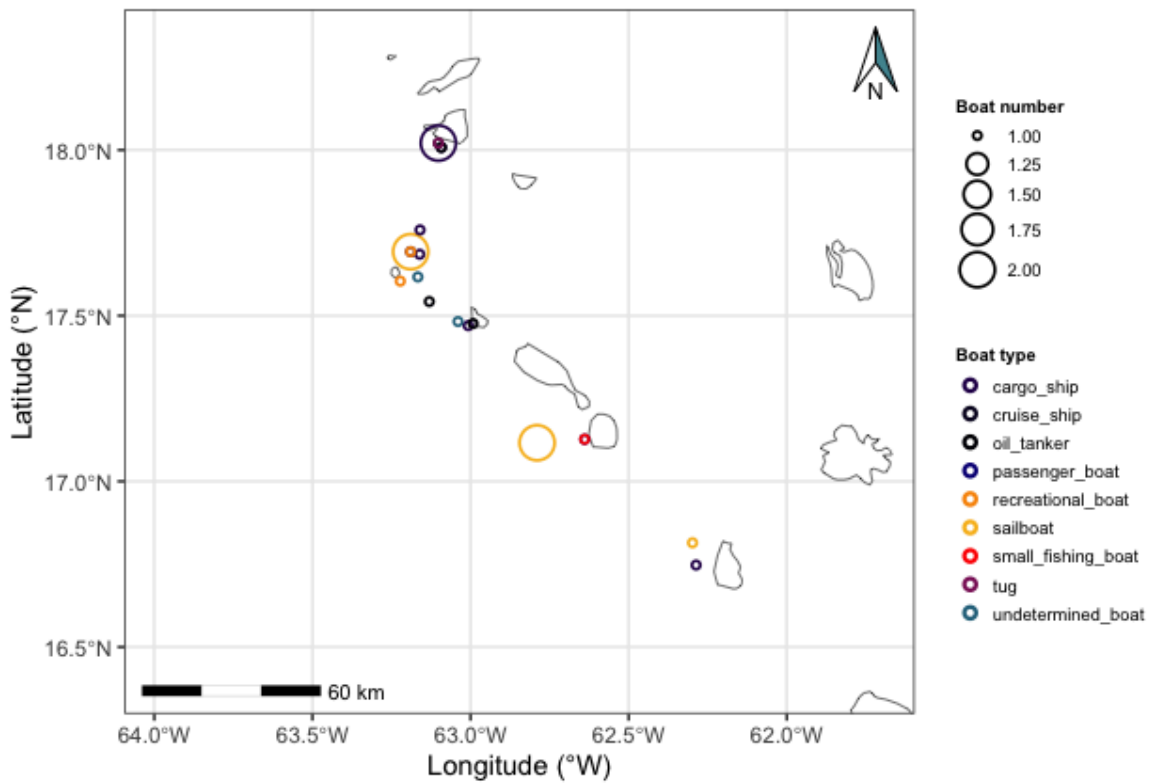


Figure 6.1 : Map of the number and type of boats observed during visual survey

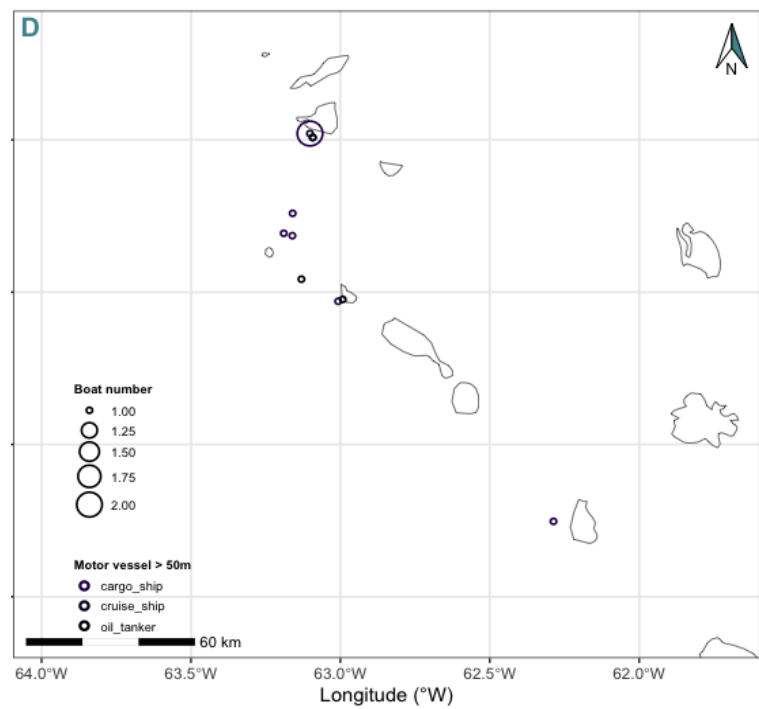
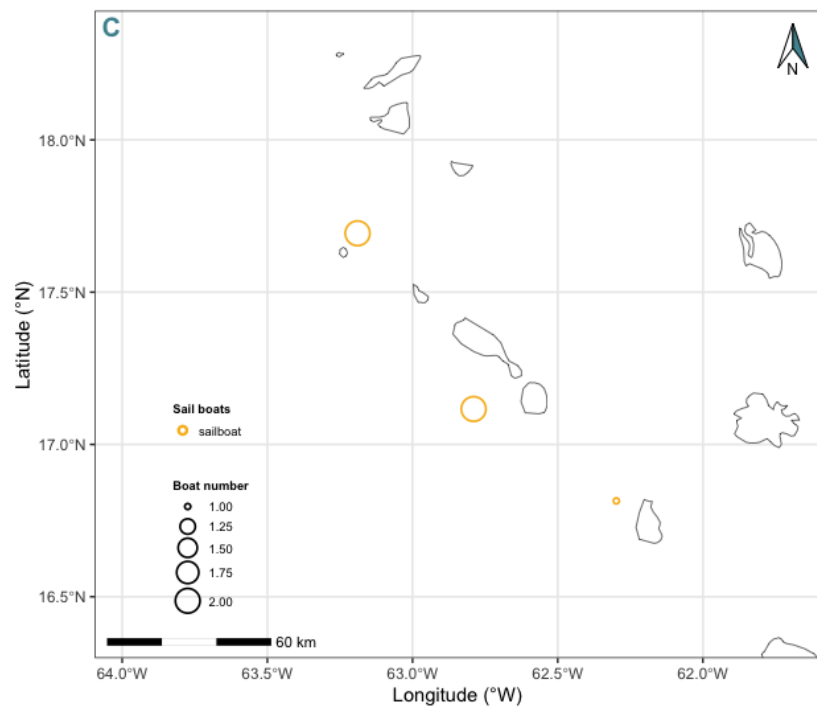
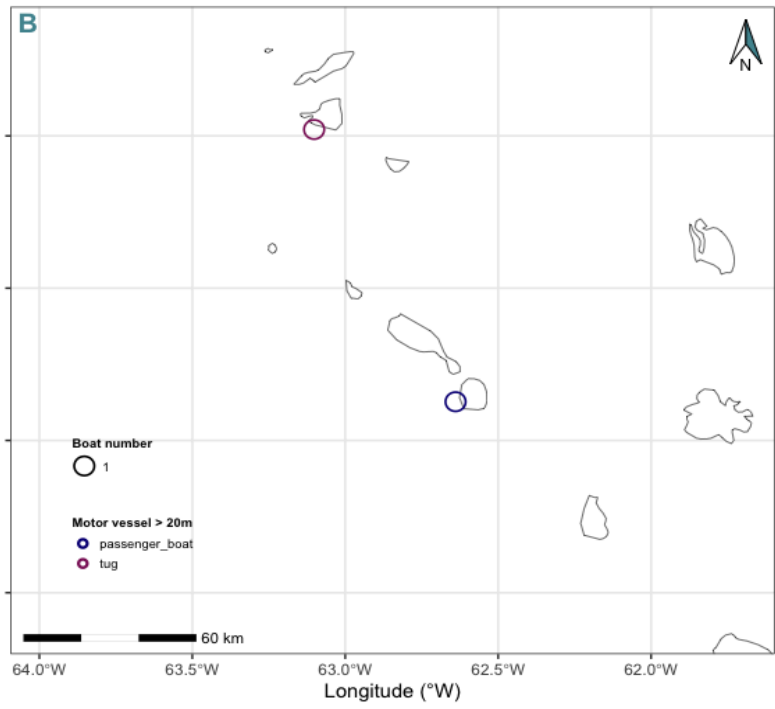
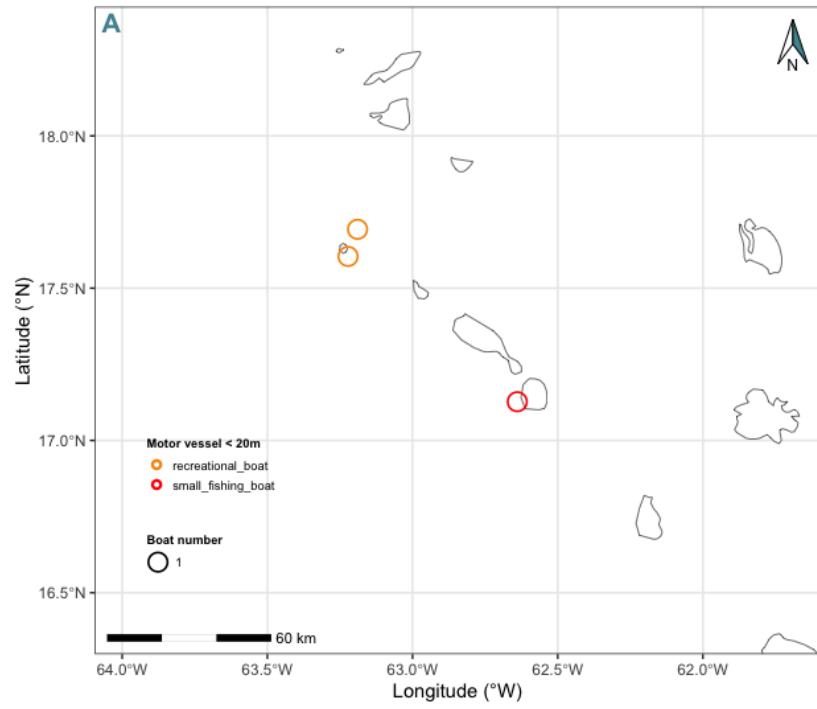


Figure 6.2 : Maps of the different categories of boats observed during the visual survey with A) Motor vessel < 20m; B) Motor vessel > 20m; C) Sail boats; D) Motor vessel > 50m

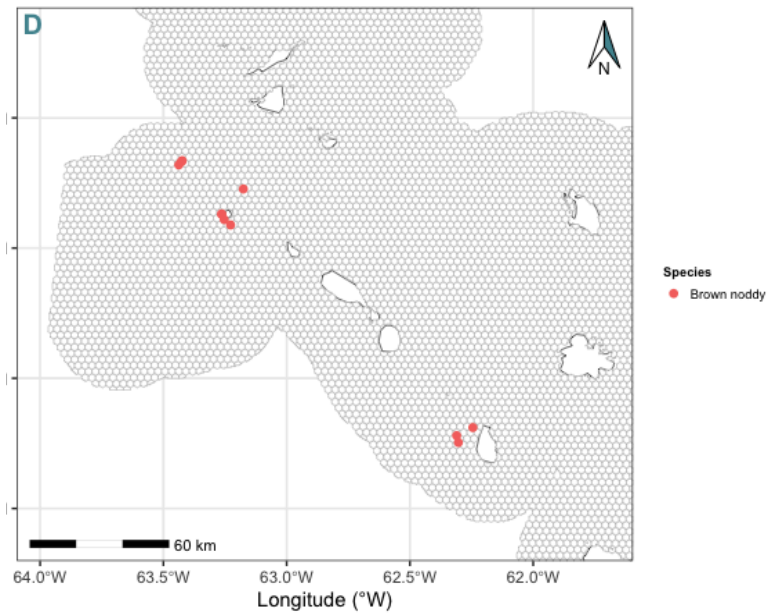
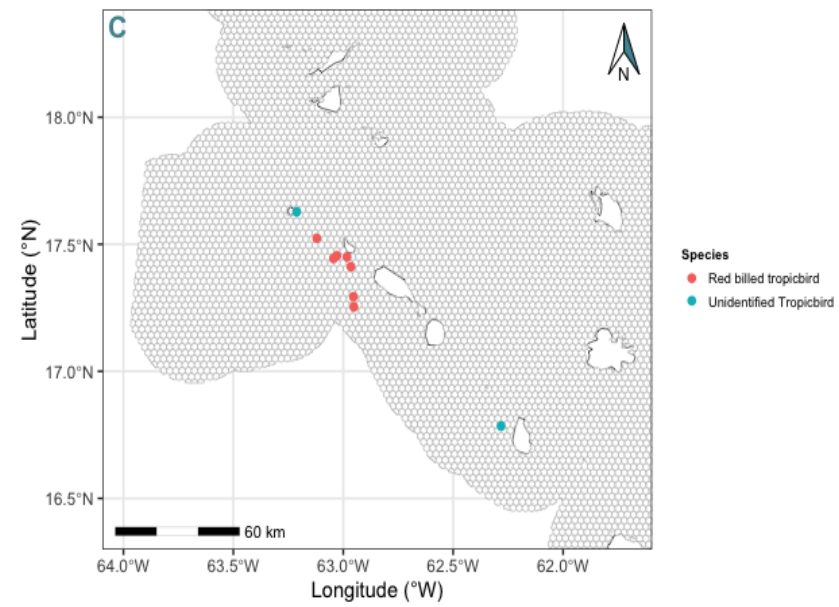
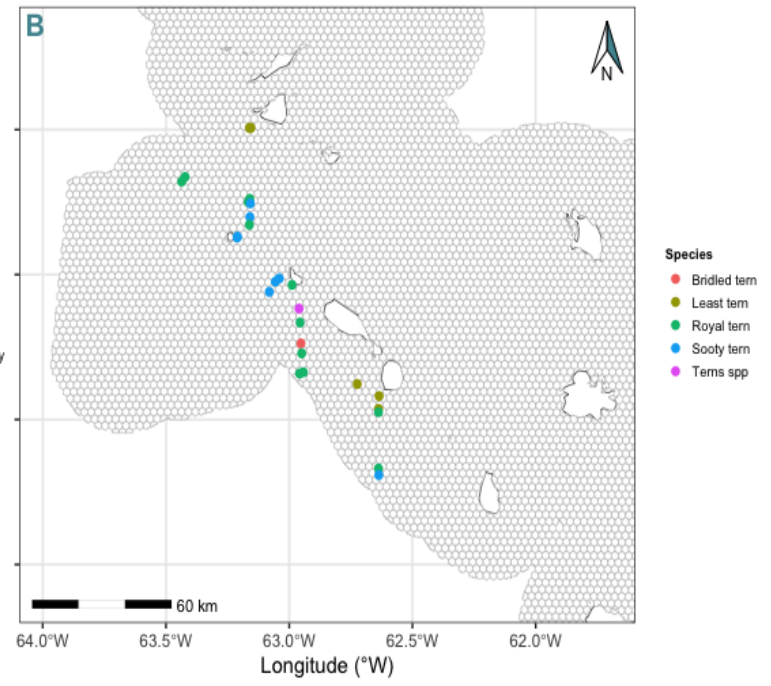
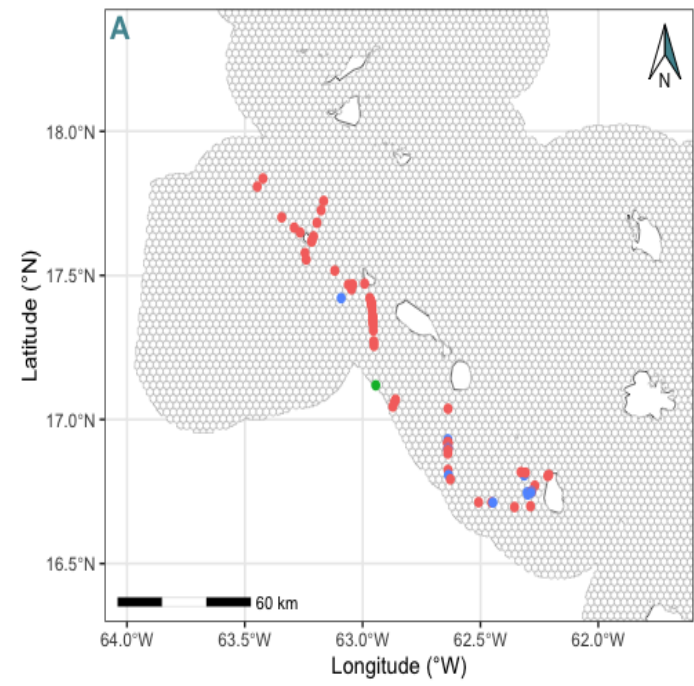
Seabird species monitored :

- Bridled tern (*Onychoprion anaethetus*)
- Brown booby (*Sula leucogaster*)
- Brown noddy (*Anous stolidus*)
- Laughing gull (*Leucophaeus atricilla*)
- Least tern (*Sterna antillarum*)
- Magnificent frigatebird (*Fregata magnificens*)
- Masked booby (*Sula dactylatra*)
- Red billed tropicbird (*Phaethon aethereus*)
- Red footed booby (*Sula sula*)
- Royal tern (*Thalasseus maximus*)
- Sooty tern (*Onychoprion fuscatus*)

Table 2: Seabird sightings recorded during expedition 6 of 2024.

Species	Scientific name	Nbr of observation
Bridled or Sooty tern	<i>Onychoprion spp.</i>	106
Bridled tern	<i>Onychoprion anaethetus</i>	1
Brown booby	<i>Sula leucogaster</i>	129
Brown noddy	<i>Anous stolidus</i>	26
Laughing gull	<i>Leucophaeus atricilla</i>	1
Least tern	<i>Sterna antillarum</i>	9
Magnificent frigatebird	<i>Fregata magnificens</i>	42
Masked booby	<i>Sula dactylatra</i>	1
Red billed tropicbird	<i>Phaethon aethereus</i>	7
Red footed booby	<i>Sula sula</i>	68
Royal tern	<i>Thalasseus maximus</i>	15
Sooty tern	<i>Onychoprion fuscatus</i>	15
Terns spp	<i>Sterninae spp.</i>	7
Unidentified Tropicbird	<i>Phaethontidae spp.</i>	2

Figure 7: Maps of sightings seabirds families recorded during expedition 5 of 2024 with A) Booby sightings; B) Terns sightings; C) Tropicbirds sightings; D) Noddy sightings; E) Others sightings



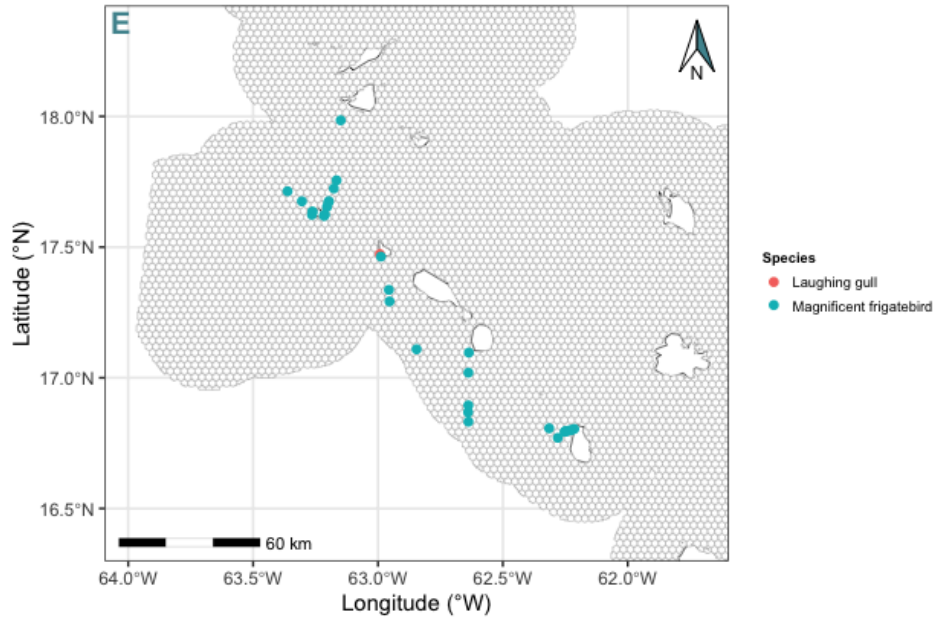


Figure 7 : Maps of sightings of seabird families recorded during expedition 3 of 2024 with A) the Booby sightings; B) Terns sightings; C) Tropicbirds sightings; D) Noddy sightings; and E) Others sightings.



Brown booby (*Sula leucogaster*)

IMPACT

The CCS Ti Whale An Nou program aims to act towards cetacean protection acting on four axes:

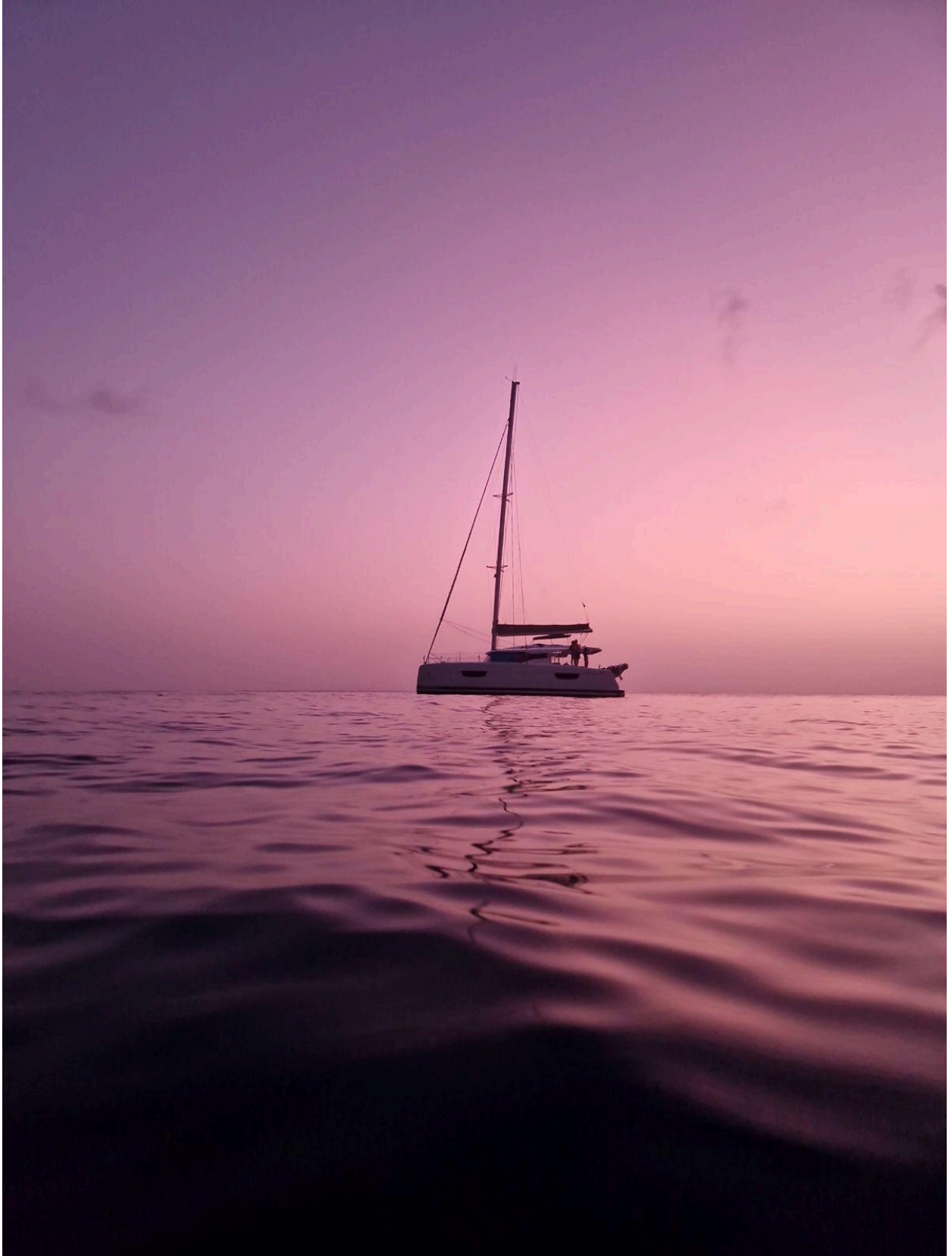
Cooperation, Education, Research and Conservation.

Impact of Cooperation :

This expedition was made possible through funding from the Regional Cooperation Fund of the Prefecture of Martinique. As part of this initiative, we hosted volunteer representatives from various territories, including Martinique, Sint Maarten, Saint Martin, Grenada, Trinidad and Tobago, Bonaire, and Antigua. The primary goal was to strengthen connections between conservationists and ocean enthusiasts in the northern Lesser Antilles, fostering long-term regional cooperation and conservation efforts.

All volunteers received training in field-based cetacean data collection, following a standardized research protocol. They were introduced to both visual and acoustic monitoring techniques, gaining a comprehensive understanding of the challenges facing cetacean conservation in the Caribbean, particularly in the northern Lesser Antilles. Notably, two officers from the Environmental Awareness Group (Joshel Wilson & Miquel Garcia, EAG), a marine ranger from the Sint Maarten Nature Foundation, Titouan Grancher, and a conservationist from Martinique natural regional park (Laurent Louis-Jean, PNRM) are all likely to benefit from this training in their professional roles. This expedition has set the path for new collaboration as well as strengthening existing partnerships.

Additionally, we were able to train our representative from Bonaire, Gwenaëlle Margez, who is on track to become an expedition leader for future expeditions in the ABC Islands. This expedition and the accompanying capacity-building efforts have laid a strong foundation for future collaborations with established organizations dedicated to biodiversity conservation in the region.



Impact of Research :

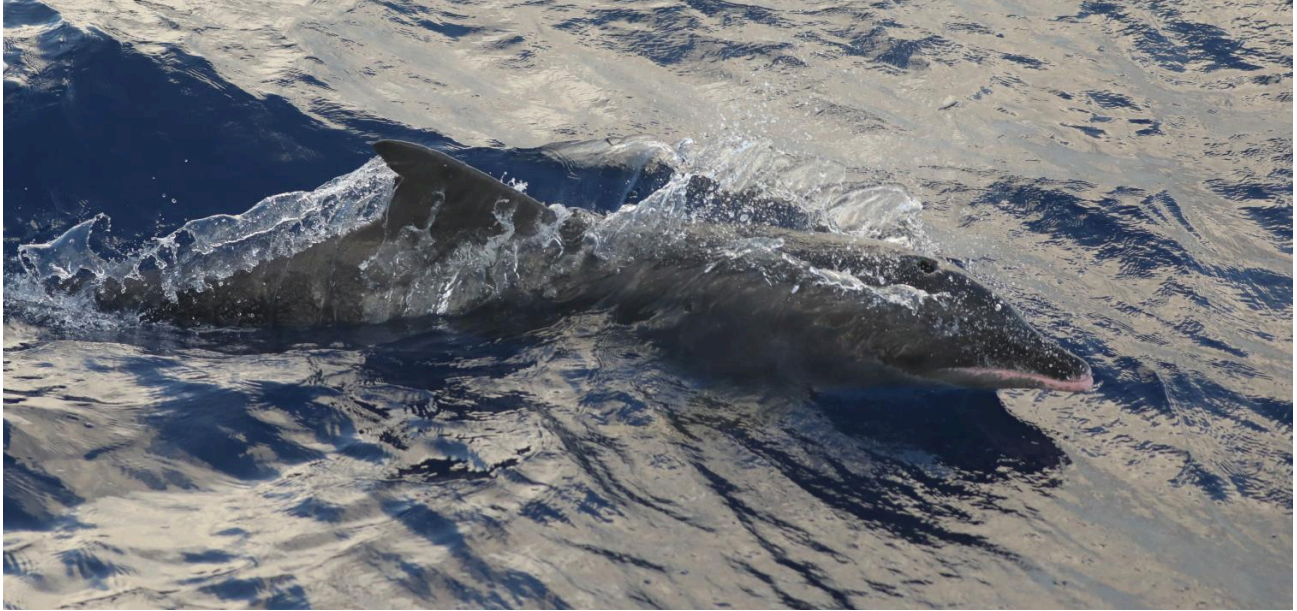
This expedition provided significant findings regarding the presence and behavior of cetaceans in the northern Lesser Antilles, a region that is challenging to survey due to difficult weather conditions reducing the visibility. The visual confirmation of sperm whales in Sint Maarten, a first for this location, adds valuable data to our understanding of their distribution along the Lesser Antilles arc. Additionally, we were able to photograph the flukes of several sperm whales, including juveniles and calves, which enhances our knowledge of the local sperm whale population.

EC1 codas, a vocalization pattern typical of the most common sperm whale clan in the Lesser Antilles, were recorded in both Saint Kitts and Montserrat, further contributing to our understanding of sperm whale communication and behavior in the region.

During the survey in Montserrat, we encountered a group of bottlenose dolphins that appeared to be attracted by the presence of sperm whales. A similar interaction was observed in 2023, suggesting a possible pattern of association between these species in the area. The scarcity of dolphin sightings and acoustic detections during the rest of the expedition helped us identify potential "hotspots" of their presence based on these absence data.

One of the most notable discoveries was the sighting of Rough-toothed dolphins near Saint Eustatius, a rare occurrence in the Lesser Antilles. This observation raises important questions about whether these dolphins are rare residents or occasional visitors to the region. Photo-identification data collected during the sighting may help determine if their rarity is due to a small local population or infrequent visits to the study area.

Overall, these findings provide valuable insights into cetacean diversity, habitat use, and distribution across the Lesser Antilles.



Rough toothed dolphin, Saint-Eustachius.

Impact of Conservation :

The expedition allowed to raise awareness and create connections between people dedicated to conservation and ocean enthusiasts representing different islands of the Lesser Antilles. This capacity building is crucial and establishes regional cooperation with efficient and harmonized cetacean conservation strategies. The established collaborations in the North of the Lesser Antilles have been of a great importance and have paved the way for elaborating a precious network of actors that will be involved in future collaboration and conservation work. Based on this dynamic we expect to strengthen this network with our future expeditions. Importantly, actors such as the marine reserve in Sint Maarten have been formed to do cetacean research and conservation, providing tools to field agents to directly mobilize their new skills for conservation and management. Furthermore, the results about sperm whale presence around Sint-Maarten will allow us to understand how connected are those individuals with the rest of the Lesser Antilles which will improve our understanding of spatial connectivity with the northern islands among the cetacean community. This is of great importance for efficient conservation strategies.

Impact of Education :

The communication efforts by the CCS team surrounding the expedition and its observations played a key role in raising awareness among a wide audience. This outreach is essential in fostering a connection between local communities and the rich marine life surrounding each island. It has for example informed about the presence of sperm whales around Sint-Maarten.

Actors of conservation have been initiated to cetacean research and conservation and are now able to share knowledge about cetaceans in the Lesser Antilles. This represents a step forward to share information about cetacean presence, diversity and conservation challenges in the area.

Limitations and Challenges:

The expedition logistics faced significant challenges due to the hurricane season. Tropical Storm Ernesto delayed the boat in Guadeloupe, complicating volunteer travel plans to Sint Maarten. In general, travel between islands is costly and often requires multiple flights or lengthy delays at customs when transporting volunteers by boat, making local participation from different islands difficult. In this context, the Regional Fund for Cooperation directly covered travel and logistics expenses, making it easier for volunteers to participate.

For the first time, the expedition began in Sint Maarten rather than Martinique. The boat sailed overnight directly to Sint Maarten, maximizing valuable survey time in the northern Lesser Antilles. However, the distance between the boat rental location and the study area remains a logistical challenge for conducting surveys.

Another obstacle in the northern Lesser Antilles is the number of research permits required. Due to these complexities, we were unable to survey Antigua, Barbuda, Saint Martin, and Saint Barthelemy. Typically, weather conditions in this region also reduce visibility, but after Tropical Storm Ernesto passed, wind speeds were generally low, providing favorable conditions for cetacean detection for most of the expedition.

Acknowledgements

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The Caribbean Cetacean Society thanks Corail Caraïbes for its commitment since 2021 to the association and for the partnership regarding the rental of this catamaran.

We would also thank the Regional Natural Park of Martinique (PNRM), which also works in the protection of the marine environment, for supporting this project and for providing a Conservationist of the Nature Reserve during the mission.

Finally, we thank all the participants in the mission; the mission leader, the skipper and the volunteers, for their motivation and good spirits.

The Caribbean Cetacean Society team

Science & conservation together !

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