



CARIBBEAN CETACEAN SOCIETY

## Scientific Expedition Report

### Ti Whale An Nou program 2023



Bottlenose dolphin (*Tursiops Truncatus*). Guadeloupe.

**Expedition date :** 7th - 21th August 2023

**Expedition number :** 6th of 2023

**Islands monitored :** North islands Lesser Antilles : Montserrat, Saint Kitts & Nevis, St. Eustatius, Saba, St Maarten, Saint Martin, Saint Barthélemy. (Passed by : Martinique, Dominica, Guadeloupe)

## 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>) 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 2023 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 - Montserrat) and South (Grenada - Martinique).

This report is focused on the sixth expedition of 2023, the second in the north islands of the lesser Antilles. The nine-member crew consisted of representatives from Martinique, Mauritius, St. Maarten, Suriname, the British Virgin Islands, Antigua and Barbuda, and French Guiana. This diverse crew comprised biologists, legal experts, wildlife veterinarians, and representatives from non-Governmental organizations (NGOs).



## List of crew and affiliations

### Expedition Leader :

- **Tadzio Bervoets**, MSc. Caribbean Conservation Professional focused on Caribbean Marine MegaFauna.
- **Dr. Rocio Prieto Gonzalez** : Project manager de la CCS, Docteure en Mathématique appliquée aux suivi des cétacés.

### Scientific observers :

- **Lucas Bernier**, Scientific intern at the Caribbean Cetacean Society « Fraser's dolphin in the Lesser Antilles: Distribution, Habitat Preferences and Co-occurrence Behavior »
- **Monique Pool**, Founder and Director of the Green Heritage Fund Suriname, nature-lover and ocean enthusiast.
- **Jeremy Fong Sing**, Msc. Environmental Sciences, data analyst and environmental systems modeller.
- **Julie Pheline**, Legal Officer in love with marine mammals
- **Alexandra Fireman**, MSc. Marine Scientist focused on Sea Turtle Conservation and Ecology
- **Kendyl Berna**, ocean conservationist and filmmaker and Co-Founder of Beyond The Reef
- **Alton Bertie**, Community Outreach Manager for Beyond the Reef and Ocean Conservationist
- **Margy Church**, Secretary Board member and Project Leader of Beyond The Reef. In love with all things ocean related and passionate about the conservation of this environment

### Captain :

- **Philippe Carlyle**, Corail Caraibes

## **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.

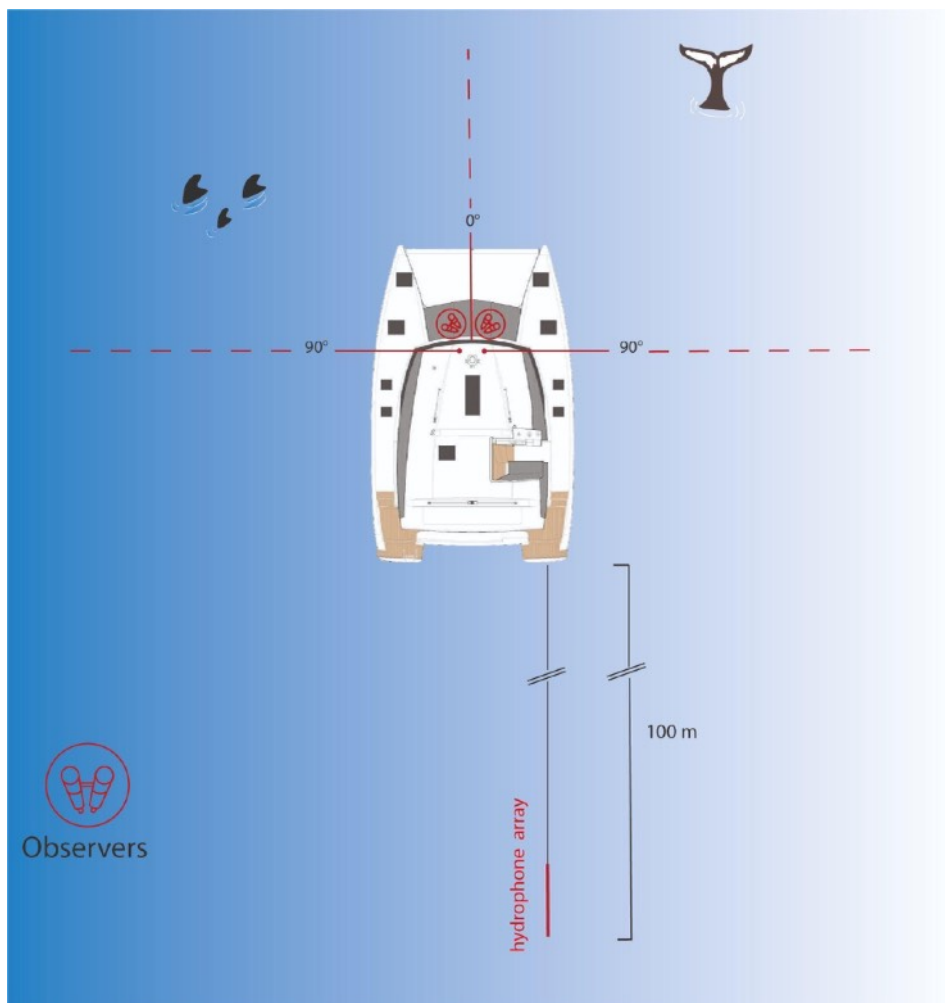
Firstly, in situ environmental parameters are recorded in order to monitor and control the detection probability of cetaceans, as certain conditions may limit the detection of species at the surface. Secondly, vessel presence or absence is recorded, as well as the numbers and types of vessels, for a 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 Observation

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  $0^\circ$  and  $90^\circ$  on each side, considering  $0^\circ$  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, fluke, blows, breach) or to locate indicators that could potentially indicate the presence of cetaceans (e.g., splash, group of birds).



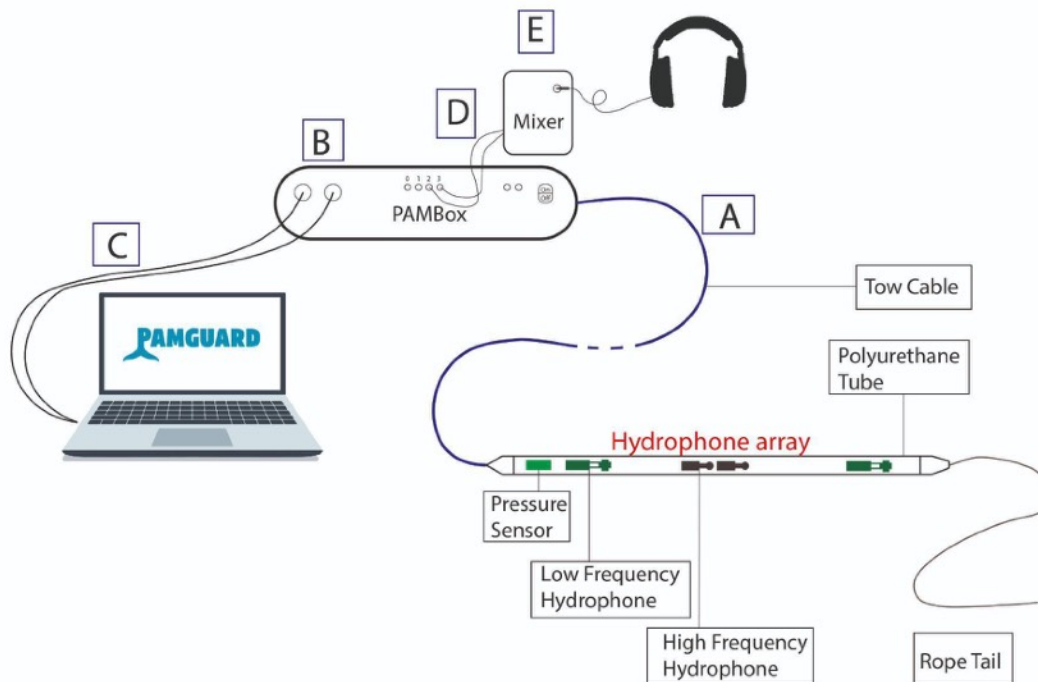
**Figure 1:** Layout of the research vessel and the area observed during the effort.

## 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.



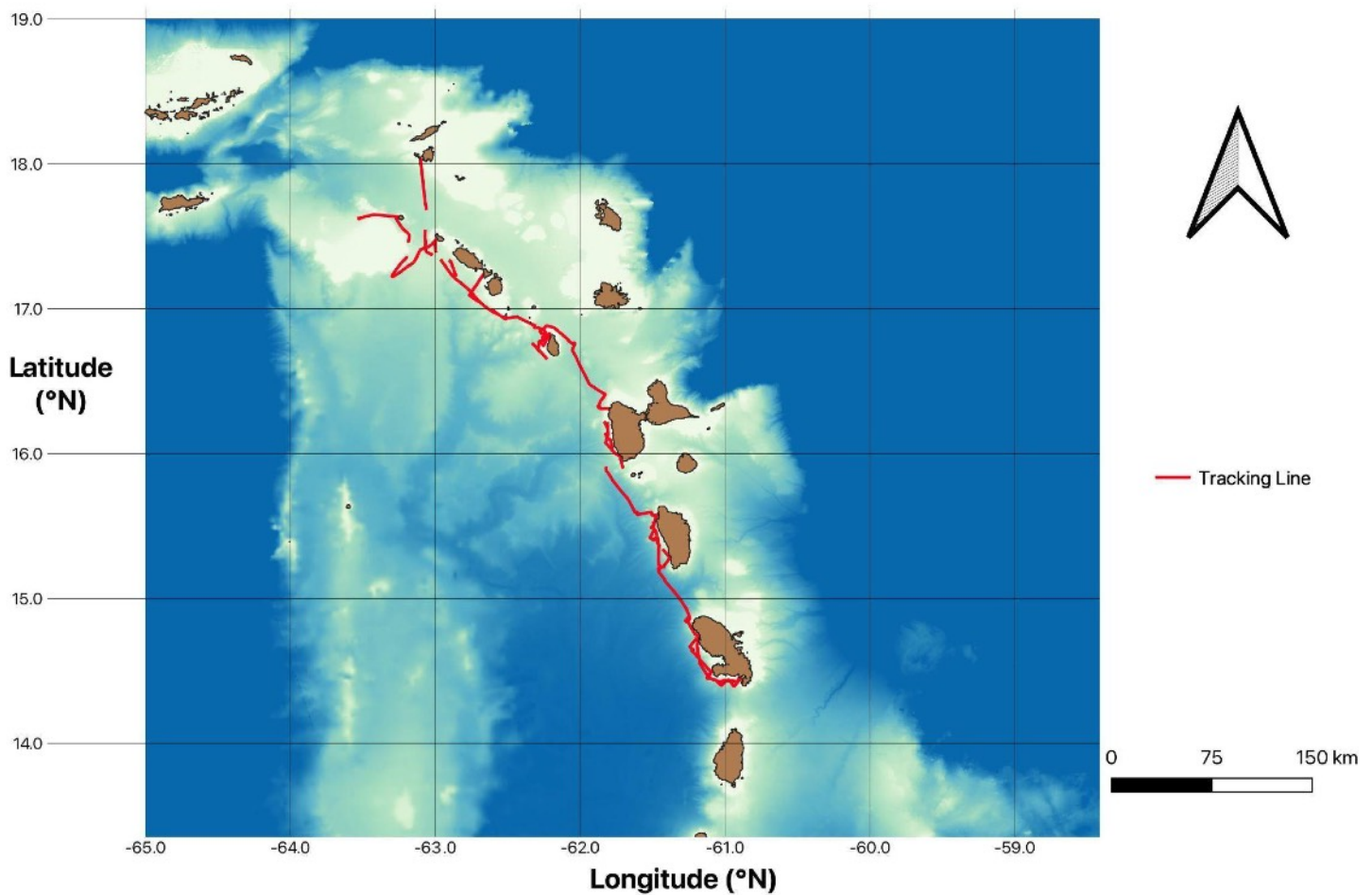
**Figure 2:** *Diagram of the Acoustic Configuration*

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 2023, five cetaceans species were monitored. The studied species include the Pantropical spotted dolphin (*Stenella attenuata*), Fraser's dolphin (*Lagenodelphis hosei*), Bottlenose dolphin (*Tursiops truncatus*), Sperm whale (*Physeter macrocephalus*), and Short-finned pilot whale (*Globicephala macrorhynchus*). The data collected on these species is summarized in Table 1, which provides details on their localization, identification certainty, group size estimates, calf presence, and other relevant information. This data serves as a valuable resource for understanding the distribution and behavior of these cetacean species in the surveyed regions.



**Figure 3:** Track of boat surveys with positive observation effort for expedition 4 of 2023.

## Cetacean Species monitored

- Pantropical spotted dolphin (*Stenella attenuata*)
- Fraser's dolphin (*Lagenodelphis hosei*)
- Bottlenose dolphin (*Tursiops truncatus*)
- Sperm whale (*Physeter macrocephalus*)
- Short-finned pilot whale (*Globicephala macrorhynchus*)

## Cetaceans sightings table :

Table 1: Cetacean sightings recorded during expedition 4 of 2023.

Localization	Species Name	Identification certainty	Group size estimate	Max. estimate	Min. estimate	Juv. presence	Juv. estimate
Martinique	Short-finned pilot whale	Certain	60	100	40	Yes	10
Martinique	Short-finned pilot whale	Certain	60	100	40	Yes	10
Martinique	Pantropical spotted dolphin	Certain	150	200	100	Yes	20
Martinique	Fraser's dolphin	Certain	30	40	20	Yes	1
Dominica	Sperm whale	Certain	1	2	1	Unk	
Dominica	Sperm whale	Certain	3	5	3	Unk	
Guadeloupe	Bottlenose dolphin	Certain	2	2	2	No	0
Guadeloupe	Unidentified dolphin	Certain	3	5	2	Unk	
Guadeloupe	Pantropical spotted dolphin	Certain	175	200	150	Yes	10
Montserrat	Sperm whale	Certain	5	8	3	Yes	1
Montserrat	Bottlenose dolphin	Certain	20	30	10	No	0
Montserrat	Sperm whale	Certain	1	1	1	Unk	
Montserrat	Sperm whale	Certain	3	5	3	Yes	1
Montserrat	Pantropical spotted dolphin	Certain	60	75	40	Yes	5
Guadeloupe	Pantropical spotted dolphin	Certain	250	300	200	Yes	25
Guadeloupe	Pantropical spotted dolphin	Certain	125	150	100	No	0
Guadeloupe	Fraser's dolphin	Certain	30	40	20	Yes	3
Guadeloupe	Pantropical spotted dolphin	Certain	20	25	15	No	0
Guadeloupe	Pantropical spotted dolphin	Certain	35	40	25	Yes	7
Dominica	Sperm whale	Certain	5	6	4	Yes	1
Dominica	Sperm whale	Certain	5	6	4	Yes	1
Dominica	Sperm whale	Certain	5	6	4	Yes	1
Martinique	Pantropical spotted dolphin	Certain	300	400	250	Yes	50
Martinique	Pantropical spotted dolphin	Certain	30	40	25	Yes	3

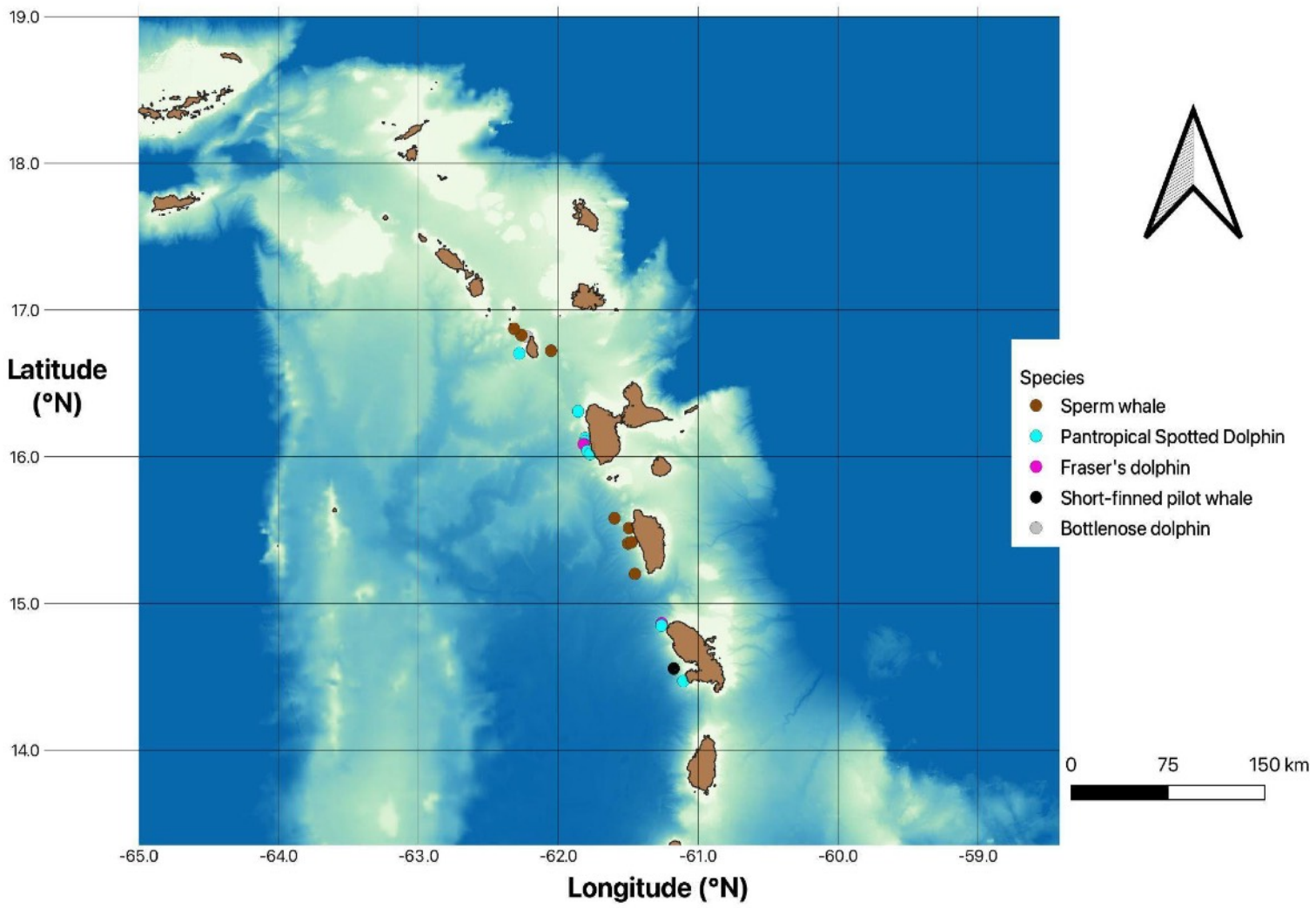


Figure 4 : Map of the confirmed cetacean sightings



Short-finned pilot whale (*Globicephala macrorhynchus*). Martinique.

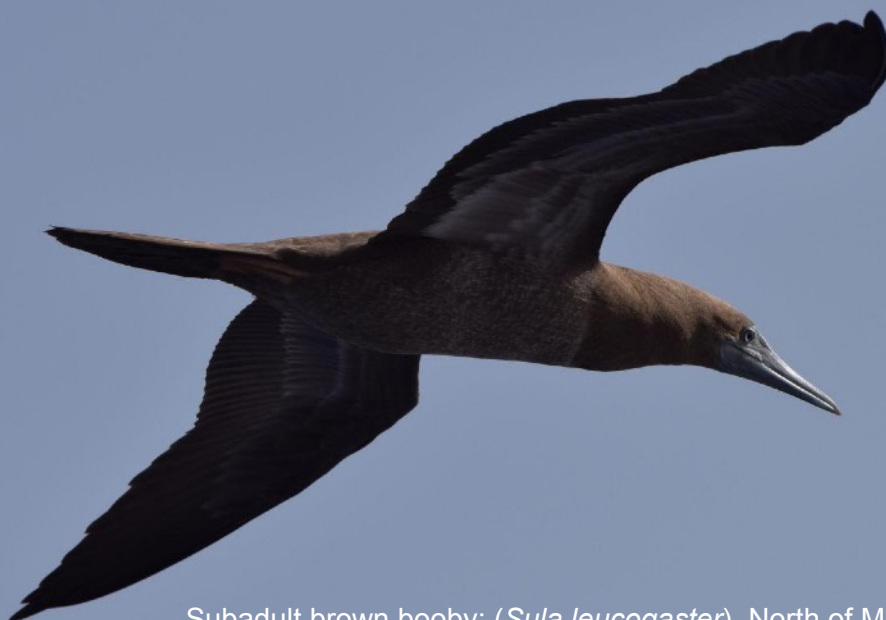


**Seabird species monitored :**

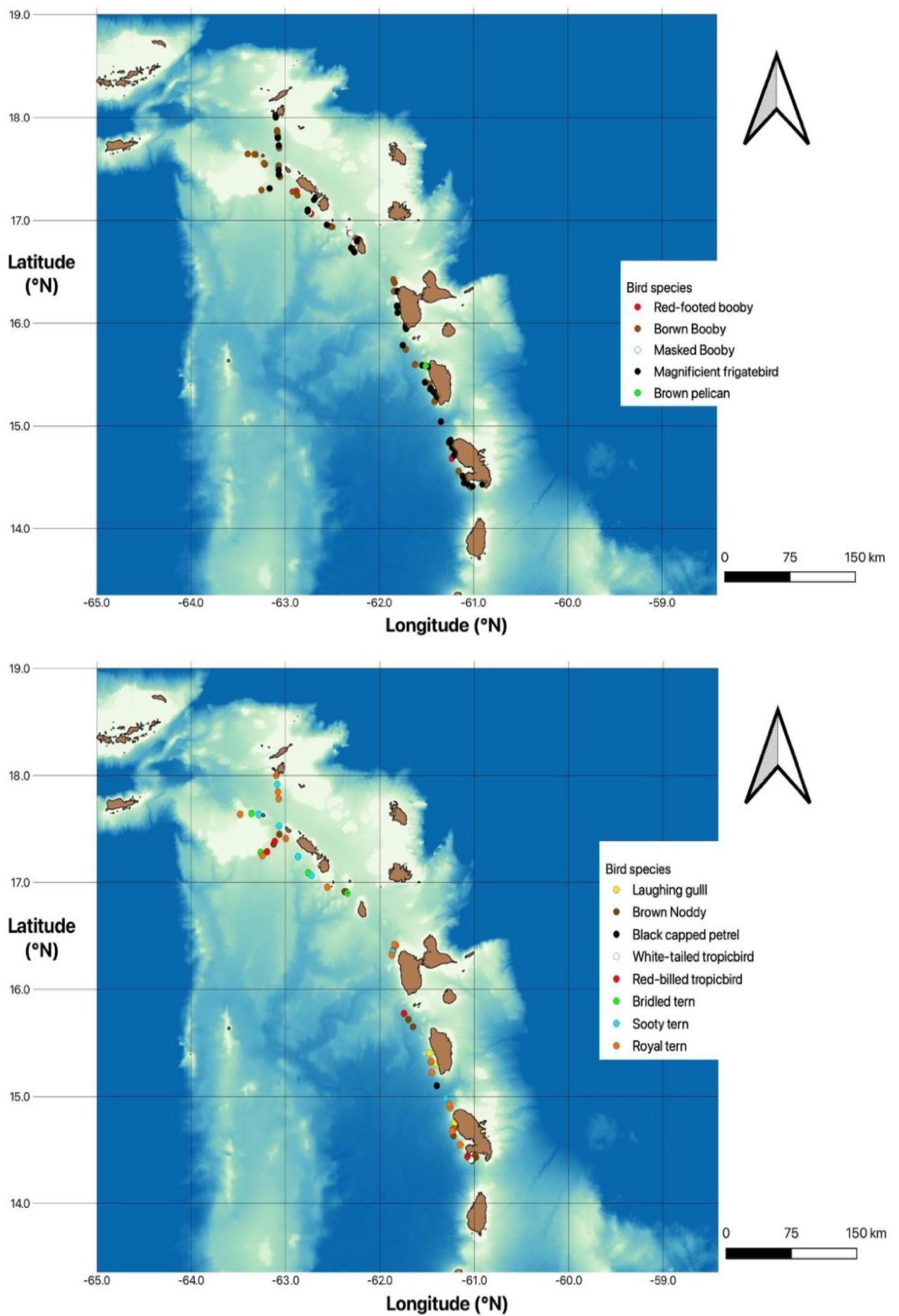
- Royal Tern (*Thalasseus maximus*)
- Sooty Tern (*Onychoprion fuscatus*)
- Bridled Tern (*Onychoprion anaethetus*)
- Red-Billed Tropicbird (*Phaethon aethereus*)
- White-Tailed Tropicbird (*Phaethon lepturus*)
- Brown Pelican (*Pelecanus occidentalis*)
- Brown Noddy (*Anous stolidus*)
- Laughing Gull (*Leucophaeus atricilla*)
- Magnificent Frigatebird (*Fregata magnificens*)
- Masked Booby (*Sula dactylatra*)
- Brown Booby (*Sula leucogaster*)
- Red-Footed Booby (*Sula sula*)
- Black-Capped Petrel (*Pterodroma hasitata*)
- Gull-Billed Tern (*Gelochelidon nilotica*)

**Table 2:** Seabird sightings recorded during expedition 6 of 2023.

Species	Nbr of observation
Royal Tern	21
Sooty Tern	15
Bridled Tern	32
Red-Billed Tropicbird	7
White-tailed Tropicbird	2
Brown Pelican	1
Brown Noddy	23
Laughing Gull	3
Magnificent Frigatebird	162
Masked Booby	7
Red-footed Booby	246
Brown Booby	243
Gull billed tern	2



Subadult brown booby: (*Sula leucogaster*), North of Montserrat



**Figure 5 :** *Maps of sightings of seabirds recorded during expedition 6 of 2023. Impact on Cooperation*

## IMPACT :

### Impact on cooperation :

The impact of regional cooperation through the Caribbean Cetacean Society's program "Ti Whale An Nou" is both significant and far-reaching. Since its initiation in 2021, this program has successfully demonstrated its significant impact in a variety of ways. Through its locally-driven approach led by Caribbean residents, the program has effectively ingrained itself in the communities it serves. "Ti Whale An Nou" encourages regional cooperation by actively involving participants from diverse Caribbean islands. By bringing together individuals from various backgrounds and islands, it fosters the sharing of knowledge and expertise, ultimately strengthening collective efforts to protect cetaceans.

This approach enhances the program's sustainability and instils a sense of ownership and responsibility among local populations for the conservation efforts in their region. Additionally, the program provides valuable training opportunities, empowering individuals passionate about marine conservation to develop expertise at a local level and actively contribute to preserving their marine environment. As an example, the upcoming expedition will see Monique Pool, the Director of the Green Heritage Fund Suriname, have learn the "Ti Whale An Nou" protocols and tools, or the three participants of the British Virgin Islands and the ongoing collaboration created between the Beyond The Reef Foundation and the CCS.

Finally, the diverse composition of the nine-member crew on the sixth expedition of 2023, including representatives from various Caribbean islands such as Anguilla, Suriname, and the British Virgin Islands, with different professional backgrounds, highlights the program's ability to unite all participants. This multidisciplinary collaboration, including biologists, legal experts, wildlife veterinarians, and representatives from non-governmental organizations, enhances the efficacy of research and conservation efforts. It facilitates the exchange of knowledge and expertise, ultimately strengthening collective efforts to protect cetaceans. This inclusive and collaborative approach is instrumental in advancing the cause of cetacean conservation in the Caribbean, making "Ti Whale An Nou" an exemplary model of regional cooperation and marine conservation efforts.



Pilot whales next to the towed array



## **Impact on Research :**

"Ti Whale An Nou" stands out as the most extensive scientific survey dedicated to gathering essential data for the study and hence, conservation of cetaceans in the Caribbean. This comprehensive approach has bridged crucial gaps in our understanding of these marine species, providing vital information that was previously lacking. The program's commitment to knowledge advancement is palpable, as it strives to bridge the Caribbean's knowledge gaps concerning cetacean diversity, distribution, population sizes, and migratory patterns. By actively participating in research missions, the Caribbean Cetacean Society makes a significant contribution to expanding our scientific knowledge of these marine mammals.

Notably, the program's reach spans the entire Caribbean region, with expeditions covering all the islands of the Lesser Antilles. This comprehensive approach ensures that research and conservation endeavors are not restricted to specific locales but extend throughout the Caribbean. In this expedition, it was recorded the first-ever listening by CCS of Sperm whales on the way of St. Maarten. This breakthrough underscores the program's role in continually uncovering new insights about the region's cetacean populations.



Sperm whale fluke

## Impact on Conservation

The “Ti Whale An Nou” expeditions, including Expedition 6, have made a significant and multifaceted impact on marine mammal conservation in the Caribbean. Key highlights of these impacts include the extensive data collection efforts that have made these expeditions the most comprehensive scientific surveys dedicated to gathering information (such as diversity, distribution, population sizes, and migratory patterns) to serve to cetacean conservation in the region. This data is pivotal for comprehending the status and requirements of these marine mammals. Beyond data collection, these initiatives focus on studying the threats faced by cetaceans. This not only advances scientific understanding but also informs the creation of more effective conservation strategies in the Caribbean region.

Equally crucial is the program's dedication to capacity building and community engagement: engaging participants from various Caribbean islands and different backgrounds. The international collaboration inherent in the diverse crew. By offering training opportunities and nurturing local expertise in marine biology and conservation, "Ti Whale An Nou" ensures the growth of a proficient cadre of experts who can actively contribute to marine mammal conservation efforts in the Caribbean.

Furthermore, by organizing expeditions across all the islands of the Lesser Antilles and categorizing them into different regions, the half year-around program ensures comprehensive coverage of the Caribbean region, enabling a holistic understanding of the challenges faced by cetaceans in various parts of the Caribbean. In summary, the “Ti Whale An Nou” expeditions, have left an indelible mark on marine mammal conservation in the Caribbean through data provision, knowledge enhancements, community engagement, international collaboration, and a steadfast commitment to the region's cetaceans and their habitats. The data collected in this expedition might help to define a marine protected area in Montserrat.





## **Impact on Education**

The education initiatives led by the Caribbean Cetacean Society, particularly within the "Ti Whale An Nou" program, wield a significant impact in elevating awareness, cultivating local expertise, and nurturing conservation endeavors throughout the Caribbean region. Central to this impact is the program's unwavering emphasis on education, interwoven with cooperation, research, and conservation, signifying a resolute commitment to heightening awareness regarding cetaceans and their conservation imperatives among both local communities and a broader audience.

Training opportunities are integral to these missions, actively involving participants from numerous Caribbean islands. This hands-on engagement in the realms of marine biology and conservation equips individuals with invaluable skills and knowledge, thereby contributing to the local development of expertise. In this expedition five people without previous experience were trained, including the captain. The program's commitment to a diverse team, encompassing biologists, researchers, legal experts, wildlife veterinarians, and representatives from non-governmental organizations underscores its dedication to a multidisciplinary approach to education. This diversity facilitates the cross-fertilization of knowledge and expertise, enriching the educational experience.

Furthermore, education initiatives extend to the dissemination of research findings, with outcomes from scientific expeditions being shared with the public, policymakers, and stakeholders. This dissemination actively contributes to informed decision-making and the formulation of policies aimed at safeguarding cetaceans and their habitats.



Pilot whale underwater

## **Limitations and Challenges**

The "Ti Whale An Nou" expeditions have undoubtedly made significant strides in advancing marine mammal conservation in the Caribbean. However, they do face certain limitations and challenges that warrant attention.

First and foremost, resource constraints present a formidable barrier. The organization of extensive scientific expeditions across multiple regions demands substantial financial and logistical resources. Securing adequate funding and essential equipment for these missions can be a daunting task, potentially restricting the scale and frequency of our operations. Additionally, we encountered logistical difficulties in obtaining the French permit, which, on this occasion, was granted allowing us to gather cetacean data in French territories.

The Caribbean region's weather and environmental factors poses additional challenges. Its susceptibility to tropical storms and hurricanes can disrupt our expedition schedules and jeopardize the safety of our crew. Unpredictable weather conditions may adversely affect our data collection efforts and the safety of all participants. In this expedition several tropical storms were present, leading to long periods where we were not able to observe.

While community engagement remains a strong point of our program, it also presents its own set of challenges. Building trust and fostering collaboration with local communities can be time-consuming and demanding. Overcoming cultural and language barriers is often essential in this process. Ensuring the long-term sustainability of the "Ti Whale An Nou" program and its initiatives is of utmost importance. This involves maintaining local engagement and support while securing ongoing funding.

Despite our prioritization of conservation practitioners actively involved in Caribbean Megafauna conservation, we faced a funding shortfall to cover travel costs. As a result, no participants from the Marine Parks were able to join this expedition.

In conclusion, while the "Ti Whale An Nou" expeditions have achieved notable successes in marine mammal conservation, they do grapple with resource constraints, logistical challenges, and the unpredictable Caribbean environment. Moreover, sustaining community engagement and securing ongoing funding remain essential for the program's continued impact and success.





## Acknowledgements

This work has been achieved thanks to the financial support of the World Wide Fund for Nature (WWF-NL), Corail Caraïbes and the Fondation de la Mer; we are grateful for their partnership.

We would also like to express our gratitude to all the team who joined us from islands near and far, our expedition leaders, the captain, and Corail Caraïbes for the logistical support of the expedition and commitment to the association.

A special thanks on this expedition goes to the Beyond The Reef Foundation for their participation and for their support to the CCS. Finally, a big thank you to our master student Lucas Bernier for all the data analysis.

The Caribbean Cetacean Society team

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