



CARIBBEAN CETACEAN SOCIETY

## Scientific Expedition Report

### Ti Whale An Nou program 2023



Risso's dolphin (*Grampus griseus*) in the St Lucia Channel

**Expedition date :** 13th - 26th June 2023

**Expedition number :** 4th of 2023

**Islands monitored :** Southern islands - Martinique, St. Lucia, St. Vincent and the Grenadines and Grenada

## 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 dedicated to the fourth expedition of 2023, which is the second in the “southern” islands region for 2023. The crew of nine people represented six island nations (Martinique, St. Lucia, St Vincent and the Grenadines, Grenada, Turks & Caicos Islands and Jamaica). This crew was composed of biologists, Fisheries officers, representatives from the French Embassy, a wildlife veterinarian and non-Governmental organization (NGO) representatives, including five Country Coordinators from the Wider Caribbean Sea Turtle Conservation Network (WIDECASST).



## List of crew and affiliations :

### Expedition Leader :

- **Raven Hoflund**, Regional Coordinator of the Caribbean Cetacean Society, and Country Coordinator of the Wider Caribbean Sea Turtle Conservation Network (WIDECAST), St. Vincent and the Grenadines

### Scientific observers :

- **Jeffrey Bernus**, Director of the Caribbean Cetacean Society, Scientific expert for Guadeloupe and St Martin regional Scientific Council on marine megafauna, based in Martinique.
- **Kate Charles**, Marine biologist and Project Director of Ocean Spirits, Grenada. Country Coordinator and Conservation Outreach officer for WIDECAST
- **Dr Kenrith Carter**, Veterinary Surgeon, Wildlife and Sea turtle veterinarian at Dr Carter Veterinary Services and WIDECAST Country Coordinator, Grenada.
- **Fanny Raymond**, Project officer for Cooperation at the Embassy of France to the Eastern Caribbean, Barbados and OECS, in residence in St. Lucia.
- **Delight Ollivierre**, Senior fisheries assistant at the St. Vincent and the Grenadines Fisheries Division.
- **Damany Calder**, Environmental Officer, Ecosystems Management Branch and Fauna Unit of the National Environment and Planning Agency (NEPA), and WIDECAST Country Coordinator, Jamaica.
- **Katharine Hart**, Marine biologist, Turks and Caicos Whale Project and WIDECAST Country Coordinator, Turks and Caicos Islands.

### Captain :

- **Canyon Duncan**, Captain and co-owner of Nirvana Yacht Charter (an eco-conscious charter company), St. Vincent and the Grenadines



*Jeffrey Bernus, Justin Rennie (Chief Fisheries Officer Grenada), Damany Calder, Canyon Duncan, Fanny Raymond, Katharine Hart, Delight Ollivierre, Kenrith Carter, Kate Charles, Raven Hoflund.*

## 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.

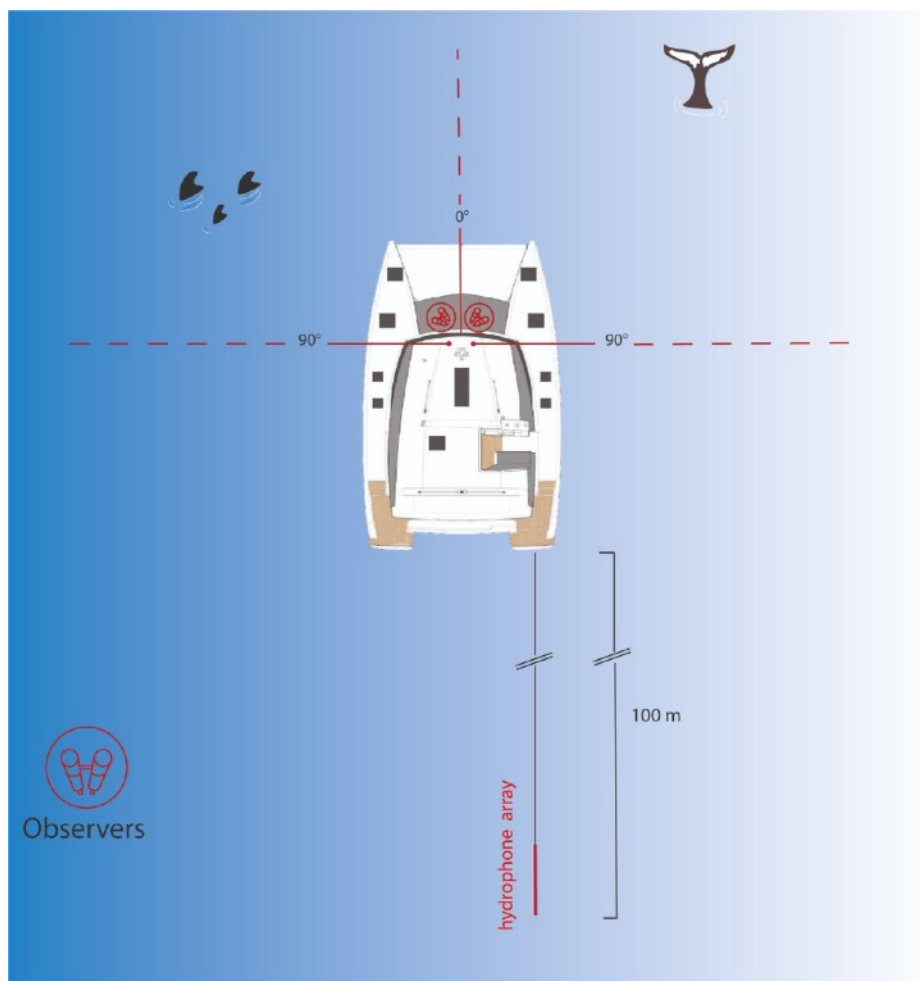
Firstly, in situ environmental parameters are recorded in order to monitor and control the detection probability of cetaceans, as certain conditions may limit the detection of species at the surface. Secondly, vessel presence or absence is recorded, as well as the numbers and types of vessels, for a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



Pantropical spotted dolphin (*Stenella attenuata*) in the Grenadines

## 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).



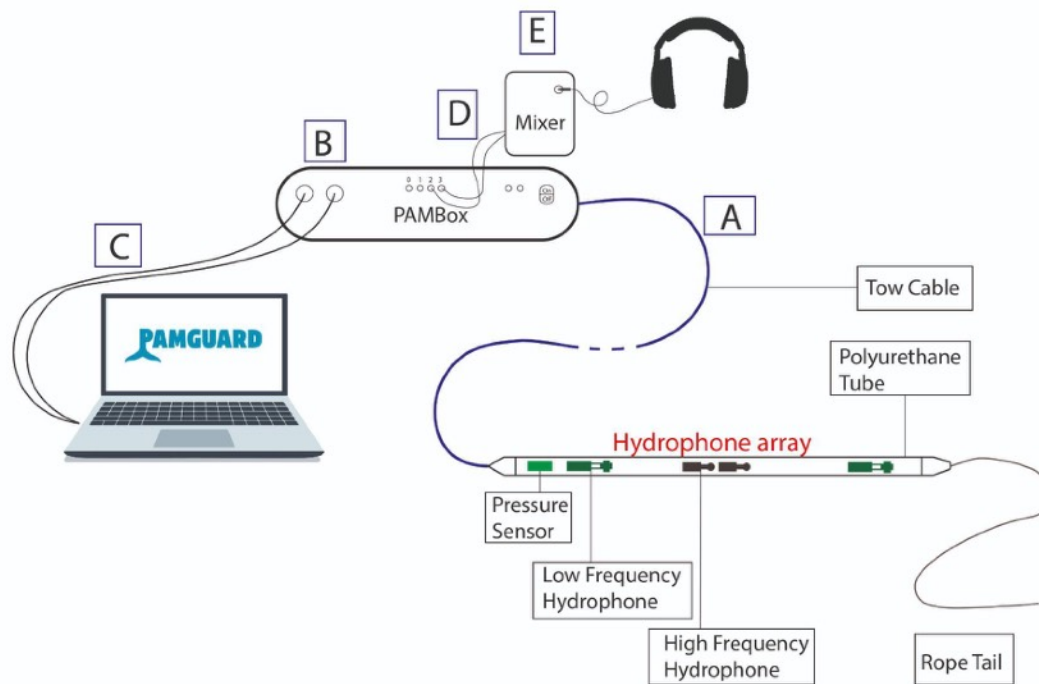
**Figure 1:** *Layout of the research vessel and the area observed during the effort.*

## 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.



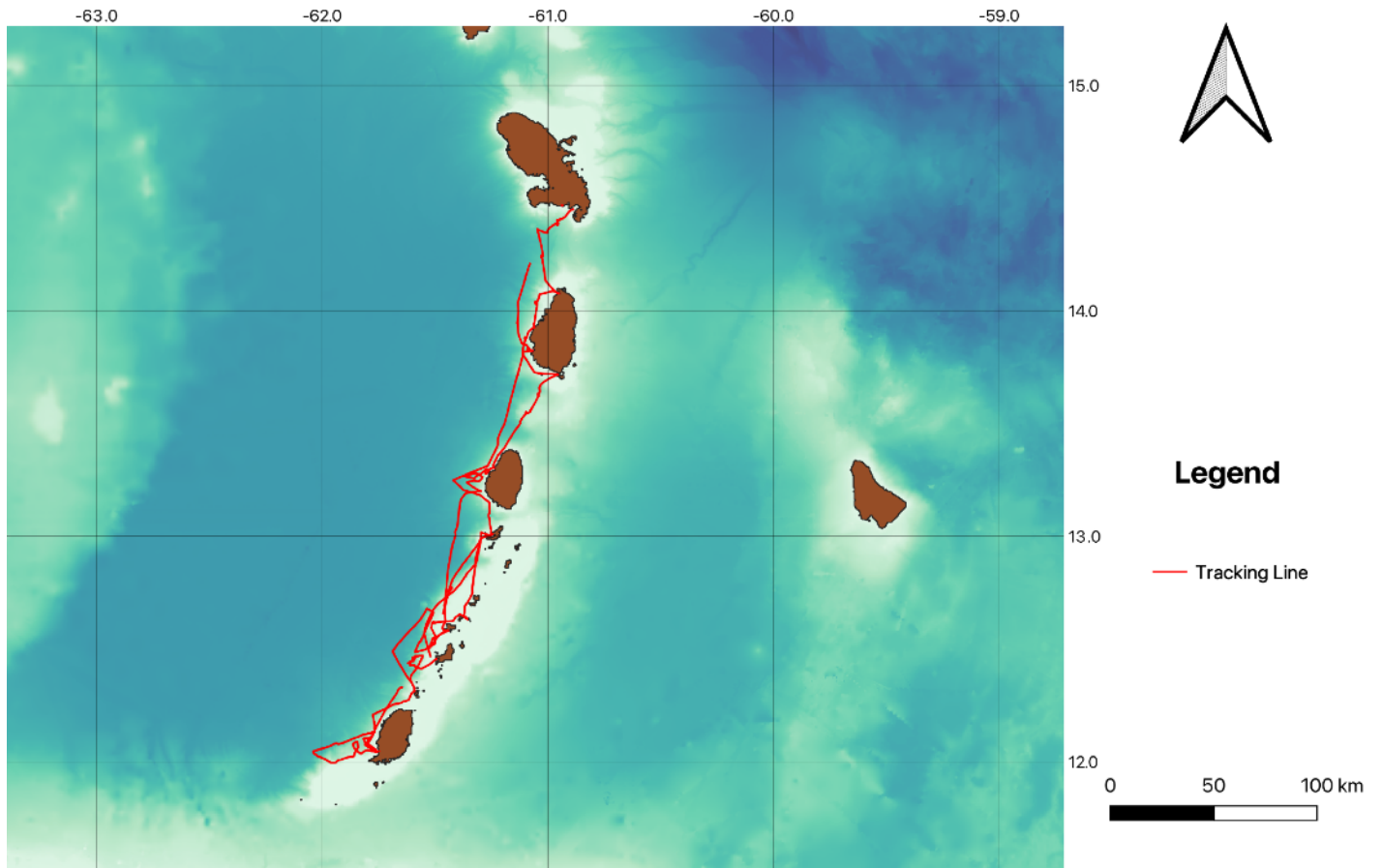
**Figure 2:** *Diagram of the Acoustic Configuration*

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

Boat tracking associated with positive observation effort.  
June 2023



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



Bryde's whale (*Balaenoptera brydei*) in Grenada

## Cetaceans sightings table :

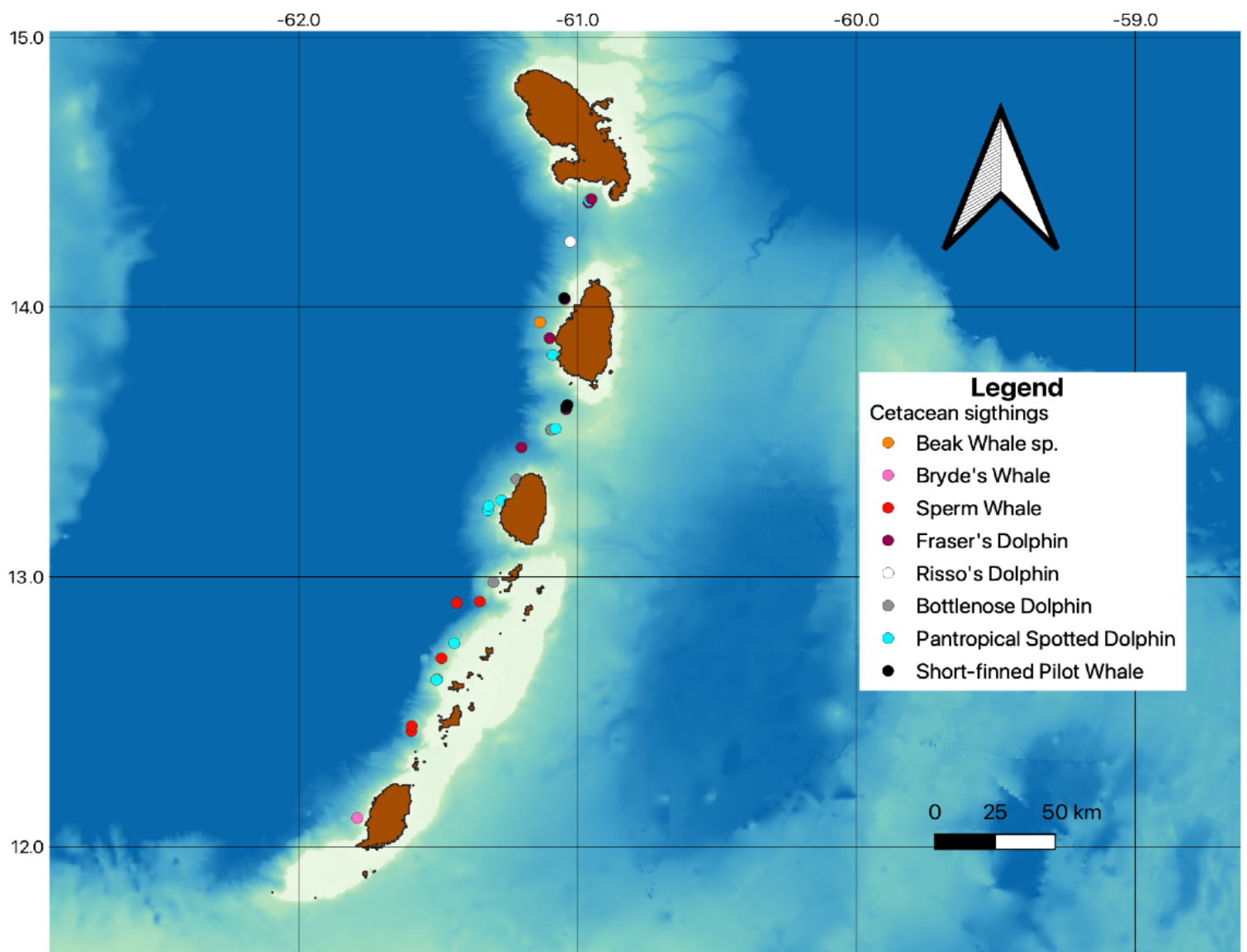
Table 1: Cetacean sightings recorded during expedition 4 of 2023.

Obs. ID	Localisation	Species Name	Identification Certainty	Group size estimate	Max. Group Size	Min. Group Size	Calf/ Juvenile Presence	Nbr Calf/ Juvenile
1	Grenada	Dolphin sp.	Uncertain	1	1	1	Unk	
2	Grenada	Bryde whale	Certain	3	3	3	Yes	1
3	Grenada	Dolphin sp.	Uncertain	2	2	2	Unk	
4	Grenadines	Sperm whale	Certain	2	2	2	Unk	
5	Grenadines	Sperm whale	Certain	5	7	4	Yes	1
6	Grenadines	Sperm whale	Certain				Unk	
7	Grenadines	Bottlenose Dolphin	Certain	40	60	30	Yes	1
8	Grenadines	Pantropical Spotted Dolphin	Certain	40	50	20	Yes	1
9	Grenadines	Bottlenose Dolphin	Certain	10	12	7	Yes	1
10	Grenadines	Sperm whale	Certain	3	4	3	Yes	
11	Grenadines	Pantropical Spotted Dolphin	Certain	400	600	200	Yes	10
12	Grenadines	Dolphin sp.	Uncertain	3	3	3	Unk	
13	Grenadines	Sperm whale	Uncertain				Unk	
14	St Vincent	Fraser's Dolphin	Uncertain	4	5	4	Unk	
15	St Vincent	Pantropical Spotted Dolphin	Certain	165	70	230	Unk	
16	St Vincent	Pantropical Spotted Dolphin	Certain	30	40	20	Yes	4
17	St Vincent	Bottlenose Dolphin	Certain	9	10	8	Unk	
18	Saint Lucia	Pantropical Spotted Dolphin	Certain	60	120	30	Yes	4
19	Saint Lucia	Beaked whale sp.	Uncertain	3	3	3	Yes	1
20	Saint Lucia	Pantropical Spotted Dolphin	Certain	100	300	100	Yes	15
21	Saint Lucia	Bottlenose Dolphin	Certain	185	250	120	Unk	
22	Saint Lucia	Pantropical Spotted Dolphin	Certain	300	400	200	Unk	
23	Saint Lucia	Short Finned Pilot Whale	Certain	26	30	24	Yes	3
24	Saint Lucia	Fraser's Dolphin	Certain	5	5	5	Unk	
25	Saint Lucia	Short Finned Pilot Whale	Certain	26	30	24	Yes	
26	Saint Lucia	Pantropical Spotted Dolphin	Certain	200	150	100	Yes	20
27	Saint Lucia	Fraser's Dolphin	Certain	7	10	5	Unk	
28	Saint Lucia	Fraser's Dolphin	Certain	90	150	60	Yes	12
29	Saint Lucia	Short Finned Pilot Whale	Certain	150	200	100	Yes	20
30	Saint Lucia	Risso's Dolphin	Certain	11	15	9	No	
31	Martinique	Fraser's Dolphin	Certain	200	300	150	Yes	7
32	Martinique	Pantropical Spotted Dolphin	Certain	250	350	200	Yes	20



**Cetacean Species monitored :**

- Pantropical spotted dolphin (*Stenella attenuata*)
- Fraser's dolphin (*Lagenodelphis hosei*)
- Risso's dolphin (*Grampus griseus*)
- Bottlenose dolphin (*Tursiops truncatus*)
- Sperm whale (*Physeter macrocephalus*)
- Bryde's whale (*Balaenoptera brydei*)
- Pilot whale (*Globicephala macrorhynchus*)
- Undetermined Beaked whale
- Undetermined Blackfish



**Figure 4 :** Map of the confirmed cetacean sightings

## Seabird species monitored :

As sea bird species are not the main focus during the 2023 expeditions, the protocol is still in development. Several applications have been tried and during cetacean work, bird sightings are not carried out. In the results most of the observation numbers are an underestimation but are still valuable data to have preliminary trend comparison presences and species diversity. In this expedition avid birders used the ebird application which results in one table for ebirds made by confirmed birders and one table for Obsenmer by the other biologists onboard.

\* Relatively Rare for the area

\*\* Relatively Rare for the area & first known recorded nesting in the Lesser Antilles (made by Dr. Kenrith Carter)

- Royal Tern (*Thalasseus maximus*)
- Sooty Tern (*Onychoprion fuscatus*)
- Roseate Tern (*Sterna dougallii*)
- Sandwich Tern (*Thalasseus sandvicensis*)
- Bridled Tern (*Onychoprion anaethetus*)
- Audubon's Shearwater (*Puffinus lherminieri*)
- \*Great Shearwater (*Ardeana Gravis*)
- \*Manx Shearwater (*Puffinus puffinus*)
- \*Sooty Shearwater (*Ardenna grisea*)
- Red-Billed Tropicbird (*Phaethon aethereus*)
- White-tailed Tropicbird (*Phaethon lepturus*)
- Brown Pelican (*Pelecanus occidentalis*)
- \*\*Black Noddy (*Anous minutus*)
- 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*)

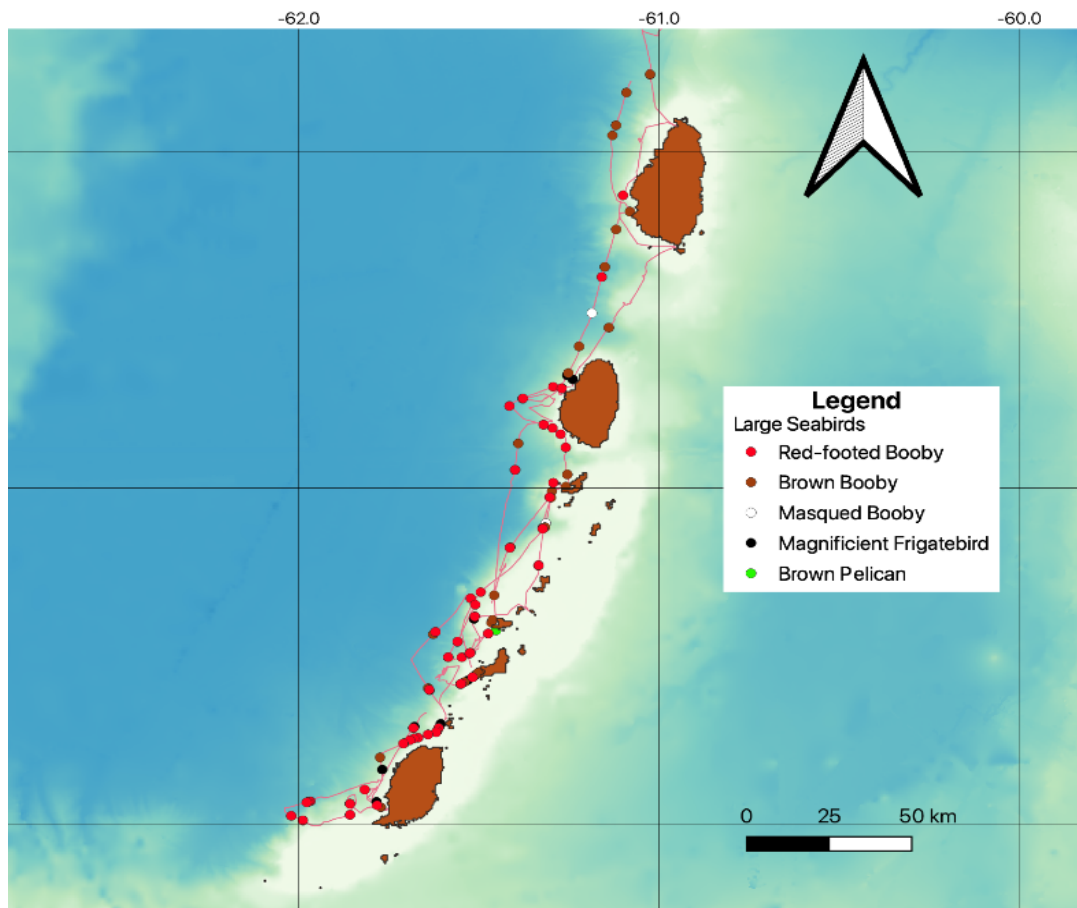


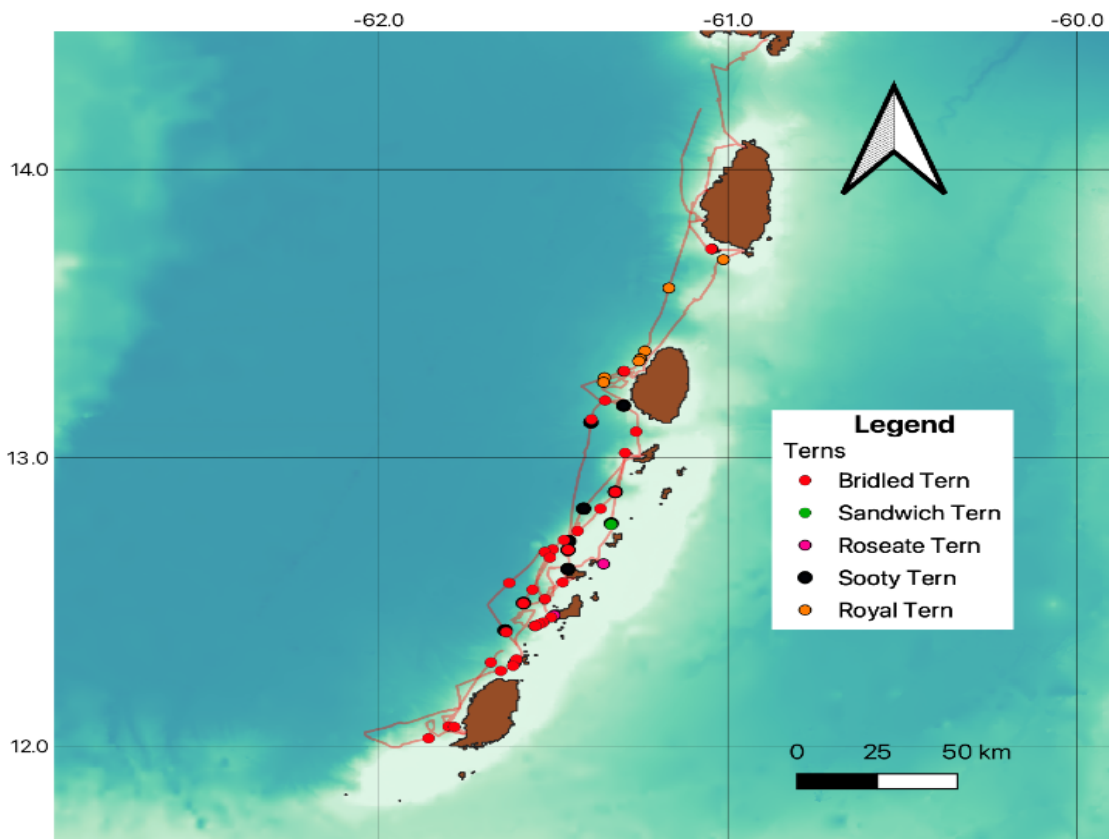
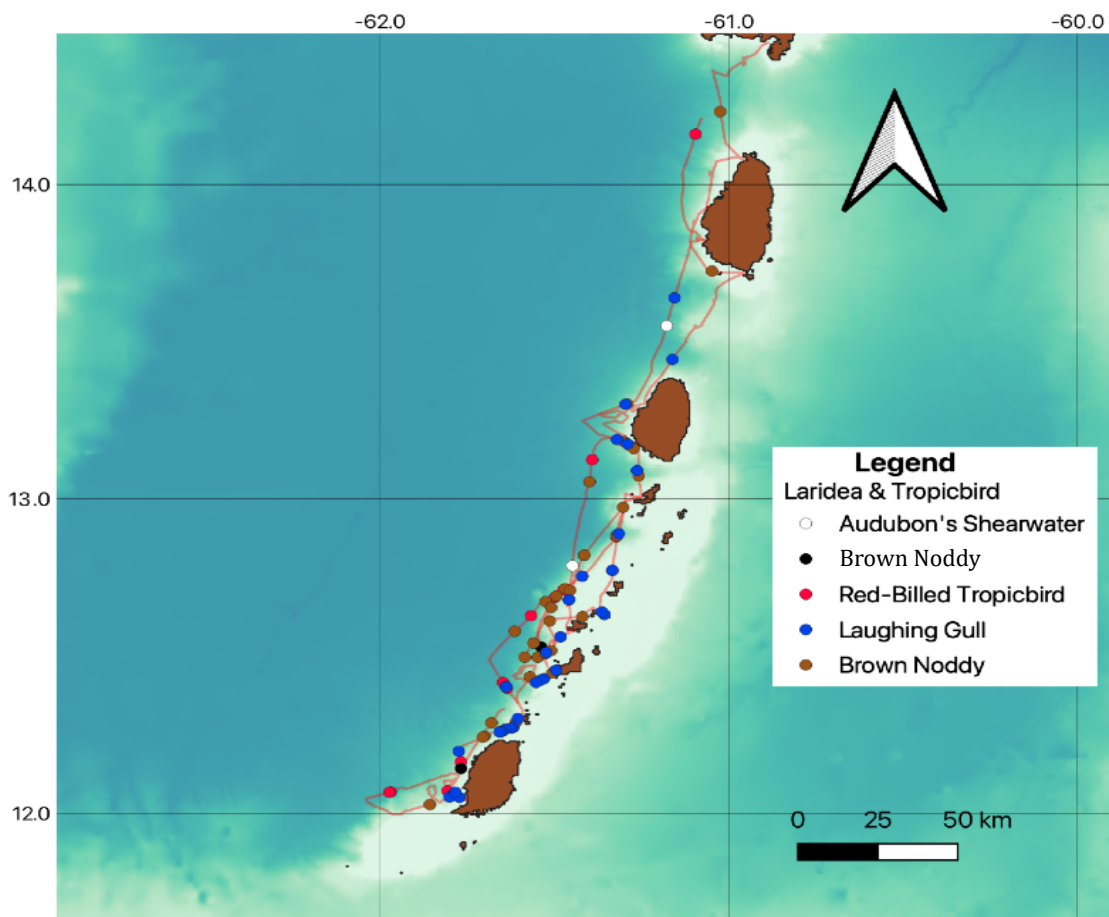
Great shearwater (*Ardenna gravis*), KCharles in Saint Lucia

**Table 2: Seabird sightings recorded during expedition 4 of 2023.**

Species	Nbr of observation (Obsenmer)	Nbr of observation (eBird)
Royal Tern	11	15
Sooty Tern	10	87
Roseate Tern	6	37
Sandwich Tern	1	1
Bridled Tern	32	237
Audubon's Shearwater	3	36
Red-Billed Tropicbird	15	29
White-tailed Tropicbird	1	1
Brown Pelican	1	3
Brown Noddy	14	638
Laughing Gull	3	400
Magnificent Frigatebird	22	162
Masked Booby	5	3
Red-footed Booby	42	2818
Brown Booby	50	1184
Manx Shearwater	3	4
Sooty Shearwater	1	1
Great Shearwater	2	11

**Seabird sighting maps :**





**Figure 5 (a-b-c) :** Maps of sightings of seabirds recorded during expedition 4 of 2023 on *Obsenmer*. Map (a) 5 species including Red-footed booby, Brown booby, Masked booby, Magnificent frigatebird and Brown pelican; Map (b) 4 species including Audubon's shearwater, Red-billed tropicbird, Laughing gull and Brown noddy; Map (c) 5 species including Bridled tern, Sandwich tern, Roseate tern, Sooty tern and Royal tern.

### Sea turtles species monitored :

Sightings of three species of sea turtles ; Leatherback turtle (*Dermochelys coriacea*), Hawksbill turtle (*Eretmochelys imbricata*) and Green turtle (*Chelonia mydas*), had also been made during the expedition. With five WIDECAST county coordinators onboard, this was a very welcome sight.



WIDECAST Country Coordinators team

## IMPACT :

### Impact on cooperation :

As part of the Caribbean Cetacean Society's commitment to cooperation, it was imperative that representatives of the Caribbean islands being monitored were actively involved in the research efforts which also lends to improved capacity amongst the individuals and their respective affiliations. The impact on cooperation in the Caribbean region has been significant. Representatives from six Caribbean island nations came together to work collaboratively. This cooperative effort has fostered a sense of synergy between government officials, representatives from various countries, and NGOs involved in biodiversity conservation and island development. Through fruitful discussions, and having representatives join us on surveys, such as the Chief Fisheries officer of Grenada who participated in the survey one morning, these stakeholders have been able to identify common goals, issues and constraints. Thus highlighting the importance of cultural exchanges. Recognizing that such exchanges can lead to improved implementation of actions aimed at achieving their shared goals. This exchange of knowledge, experience and resources enhances the participants' collective ability to address the complex issues faced by Caribbean islands, forging a path towards sustainable development and effective conservation practices in the region. As a result of this cooperation, new expeditions might be implemented in other islands of the Caribbean using the same standardized protocol and data sharing in 2024.



### **Impact on research :**

The impact of this and previous research expeditions has contributed significantly to the knowledge gap regarding cetaceans in the Caribbean region. A key success of this expedition was the collection of new photo identification data, particularly for a group of dolphins that have been monitored by several previous expeditions in the same location. Through analysis of this photo ID data, the residency status of this group could potentially be confirmed. Additionally, two (2) megapods of pilot whales have been monitored, potentially indicating the socialization among multiple families in that region at the time.

The research efforts have also resulted in the assemblage of new sightings data, which can be used to update distribution models on the species observed. These updated models can be used to enhance our understanding of species distribution and habitat use, which in turn can provide insights that contribute to regional conservation strategies. Other visual data collected includes photographs of scars found on cetaceans, enabling the analysis of potential threats faced by these animals. These scar records provide insights for identifying and evaluating the impact of human activities or natural threats, such as predators on cetacean populations, and broadens the scope of research on the dynamics and challenges faced by cetaceans in the Caribbean region.

In addition to the visual data, valuable acoustic data has also been collected, including recordings of pilot whale vocalizations, sperm whale clicks, and Fraser's dolphin whistles. This data contributes to information on species-specific vocalizations in the Caribbean region. Ultimately, all these observations provide insights into the social dynamics and movement patterns of these marine mammals whilst also enhancing our understanding of their utilization of habitats within Caribbean marine ecosystems.



Bottlenose Dolphin (*Tursiops truncatus*) in the Grenadines

## **Impact on conservation :**

One key aspect of the Ti Whale An Nou program is to build capacity among participants with various backgrounds and experiences within the Caribbean. Through these initiatives, new leaders are empowered to promote collaborative conservation actions across the islands. These capacity improvements are not just limited to those involved in the monitoring or management of the marine environment, but also include training of the captain in boat-handling skills to minimize disturbance to cetaceans. By promoting respectful practices, this ensures not only the wellbeing of cetaceans but also the development of responsible captains.

On expedition we strive to be conscious of our ocean footprint and be mindful of what is used on the boat. Using ocean safe products such as sunscreens without harmful ingredients (Oxybenzone, Octinoxate, Octocrylene and Homosalate) like Badger Balm, who kindly donated their product to our expedition. All soaps, shampoos and cleaning products onboard use only simple ingredients, Savon de Marseille, white vinegar etc. We have a no canned tuna policy on our expeditions as this fishery is often responsible for significant bycatch including dolphins.

The data collected from this research initiative is key to the creation of adaptive conservation measures by providing valuable insights into the behaviors, habitats and threats faced by marine mammals. This serves as a foundation for proposing conservation measures that are tailored to the specific needs and challenges of the Caribbean region. By implementing actions that are based on scientific evidence, stakeholders and managers can choose actions that are effective at achieving the desired conservation goals.

Onboard the research vessel several meetings concerning the development and the missions of a new NGO “Ripples to Waves” took place. This local NGO, based in Saint Vincent (SVG), is a perfect instrument for the southern islands of the Lesser Antilles such as Grenada, SVG, Saint Lucia, Martinique and beyond, to work together on marine biodiversity conservation and education through activities connecting local people to their environment.

Photo identification of scar induced by human activity (harpoon in this case)





The month of June has been appointed National Ocean month by countries around the world. It is a month focused on raising awareness for our ocean while promoting sustainable practices. This year the Caribbean Cetacean Society provided content for a startup ocean program for children in SVG. This program includes educational material on cetaceans, sharks and rays, sea turtles and ocean habitats. The goal is to create a curriculum designed to be taught in schools throughout the islands.

The reach of these education efforts regarding ocean conservation is also expected to expand as CCS and partners embark on their “Sea Camp” program throughout SVG and beyond. Sea Camps is an initiative connecting the children to the ocean through playful learning, experiential education and science, led by volunteers from throughout the region who share a deep understanding and passion of our watery home. The program seeks to engage and empower the children of our islands by encouraging a better appreciation for the ocean and its inhabitants. It is envisioned that the sea camps will inspire the next generation of ocean advocates and environmental leaders. Having ocean leaders on board together in this expedition fostered discussion for the organization of the sea camps to achieve the best impacts.

There has also been a concerted effort to provide training on cetacean research and ecology through the Ti Whale An Nou program for local representatives on each participating island. This training will empower representatives with the knowledge and skills necessary to understand and protect marine mammals.

Training for scientific protocol



**Limitations/ challenges:**

Due to unfavorable weather conditions (strong wind, swell, tropical storm) during 4.5 days of the research period, the research effort was limited to almost 9 days, thus reducing possible data acquisition.

Travel between islands in the Caribbean is also a challenge for the logistical organization of the mission.

Birds data acquisition is still in the trial phase. Two of our team were avid birders and used the ebird app throughout the expedition, which led to two different data sets that completed each other on species diversity, abundance and distribution. Decision will be taken by the end of 2023 to standardize the protocol for sea bird monitoring.



Cachalot (*Physeter macrocephalus*) - Mom and calf nursing - in the Grenadines

## Acknowledgement :

This work has been achieved thanks to the financial support of the Animal Welfare Institute (AWI), and the Siemiatkowski Foundation; 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, and Nirvana Charters for providing the captain to be trained.

We sincerely thank The French Embassy to the OECS Member States in residence in Castries for their support as well as The Fisheries Division in ST. Lucia, ST. Vincent and the Grenadines and Grenada for providing us permits to conduct research in their waters.

We are grateful to the Mustique company for the travel facilitation, Corail Caraibes for the logistical support of the expedition, and Badger Balm for their donation of eco sun protection products.

We also thank our master student Lucas Bernier for presenting all the sighting maps and tables.

The Caribbean Cetacean Society team

Science & conservation together !

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