



CARIBBEAN CETACEAN SOCIETY

Scientific Expedition Report

Ti Whale An Nou program 2023



Pygmy killer whale (*Feresa attenuata*). Baie de Saint-Pierre, Martinique.

Expedition date: 5th - 16th May 2023.

Expedition number: 3rd of 2023.

Islands monitored: North-eastern Caribbean: Montserrat, Saint Kitts & Nevis, St. Eustatius, Saba, St Maarten, Anguilla, Antigua and Barbuda.

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 third expedition of 2023, the first in the north-eastern Caribbean islands. The eight-member crew consisted of representatives from Martinique, Guadeloupe, France and Trinidad and Tobago.



List of crew and affiliations :

Expedition Leaders:

- **Valentin Teillard**, Project manager for the Caribbean Cetacean Society.

Scientific observers:

- **Yoan Doucet**, Scientific volunteer at the Caribbean Cetacean Society, Martinique.
- **Syam Nath**, Director of the Trinidad & Tobago Cetacean Sighting Network and scientific volunteer at the Caribbean Cetacean Society, Martinique.
- **Nicolas Moine**, Scientific volunteer at the Caribbean Cetacean Society, Martinique.
- **Marion Vince**, Scientific volunteer at the Caribbean Cetacean Society, Martinique.
- **Laury-Ann Paul**, Scientific volunteer at the Caribbean Cetacean Society, Martinique.
- **Audrey Montout**, Scientific volunteer at the Caribbean Cetacean Society, Martinique.

Captain:

- **Cédric Gabriel Treiber**, experienced professional skipper.



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).



Humpback whale (*Megaptera novaeangliae*). St Barthelemy.

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° 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, fluke, blows, breach) or to locate indicators that could potentially indicate the presence of cetaceans (e.g., splash, group of birds).

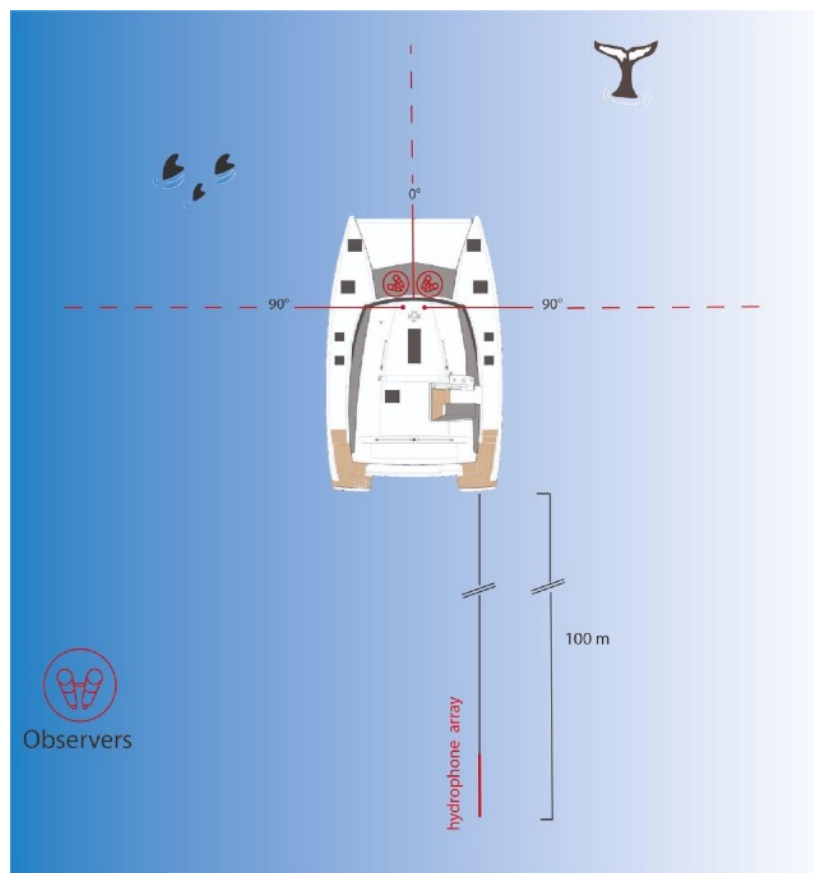


Figure 1: Layout of the research vessel and the area observed during the effort.

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.

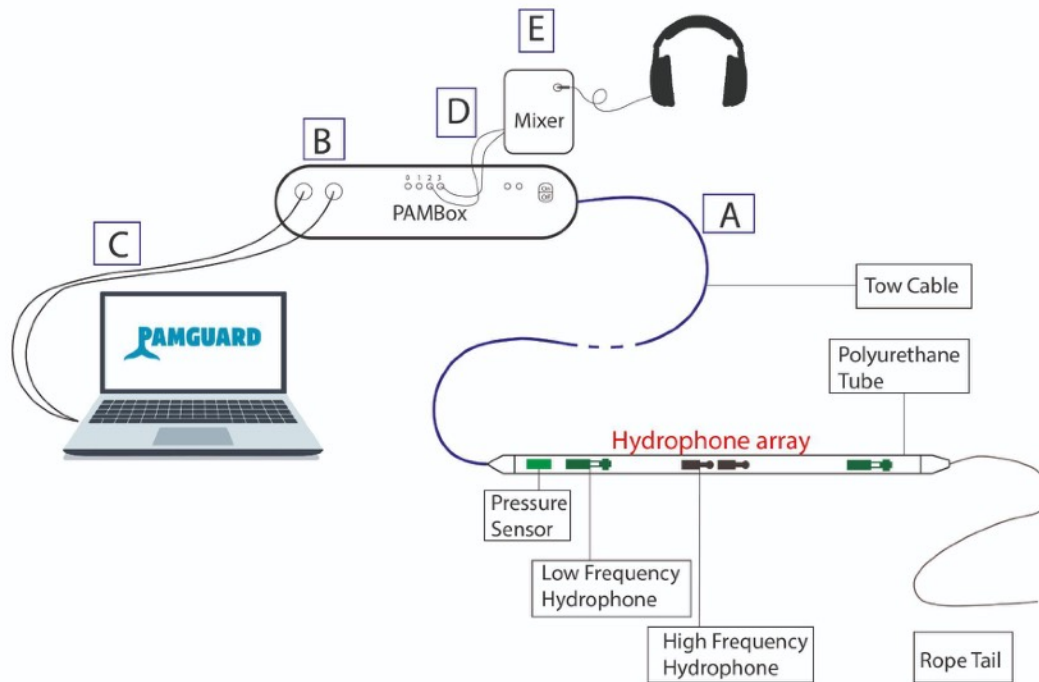


Figure 2: *Diagram of the Acoustic Configuration*

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 the Third Expedition of 2023, three cetaceans were monitored. The observed species include the Pantropical spotted dolphin (*Stenella attenuata*), Bottlenose dolphin (*Tursiops truncatus*) and Humpback whale (*Megaptera Novaeangliae*). 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 during Expedition 3 of 2023.



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

Cetacean Species monitored :

- Pantropical spotted dolphin (*Stenella attenuata*)
- Bottlenose dolphin (*Tursiops truncatus*)
- Humpback whale (*Megaptera Novaeangliae*)

Cetaceans sightings table :

Table 1: Cetacean sightings recorded during expedition 3 of 2023.

Obs ID	Localisation	Species Name	Identification	Group size estimate	Max. group size estimate	Min. group size estimate	Calf presence	Calf estimate
1	St Barthelemy	Humpback whale	Uncertain	1	1	1	Unk	
2	St Barthelemy	Humpback whale	Certain	1	2	1	Unk	
3	Anguilla	Humpback whale	Certain	1	1	1	No	0
4	Anguilla	Humpback whale	Certain	1	1	1	No	0
5	Anguilla	Humpback whale	Certain	1	1	1	No	
6	Anguilla	Humpback whale	Certain	2	2	2	No	0
7	Sint Marteen	Pantropical spotted dolphin	Certain	25	40	15	Yes	1
8	Saint Kitts	Pantropical spotted dolphin	Certain	30	40	15	Unk	
9	Nevis	Bottlenose dolphin	Certain	15	20	10	Unk	
12	Nevis	Humpback whale	Certain	1	2	1	Unk	

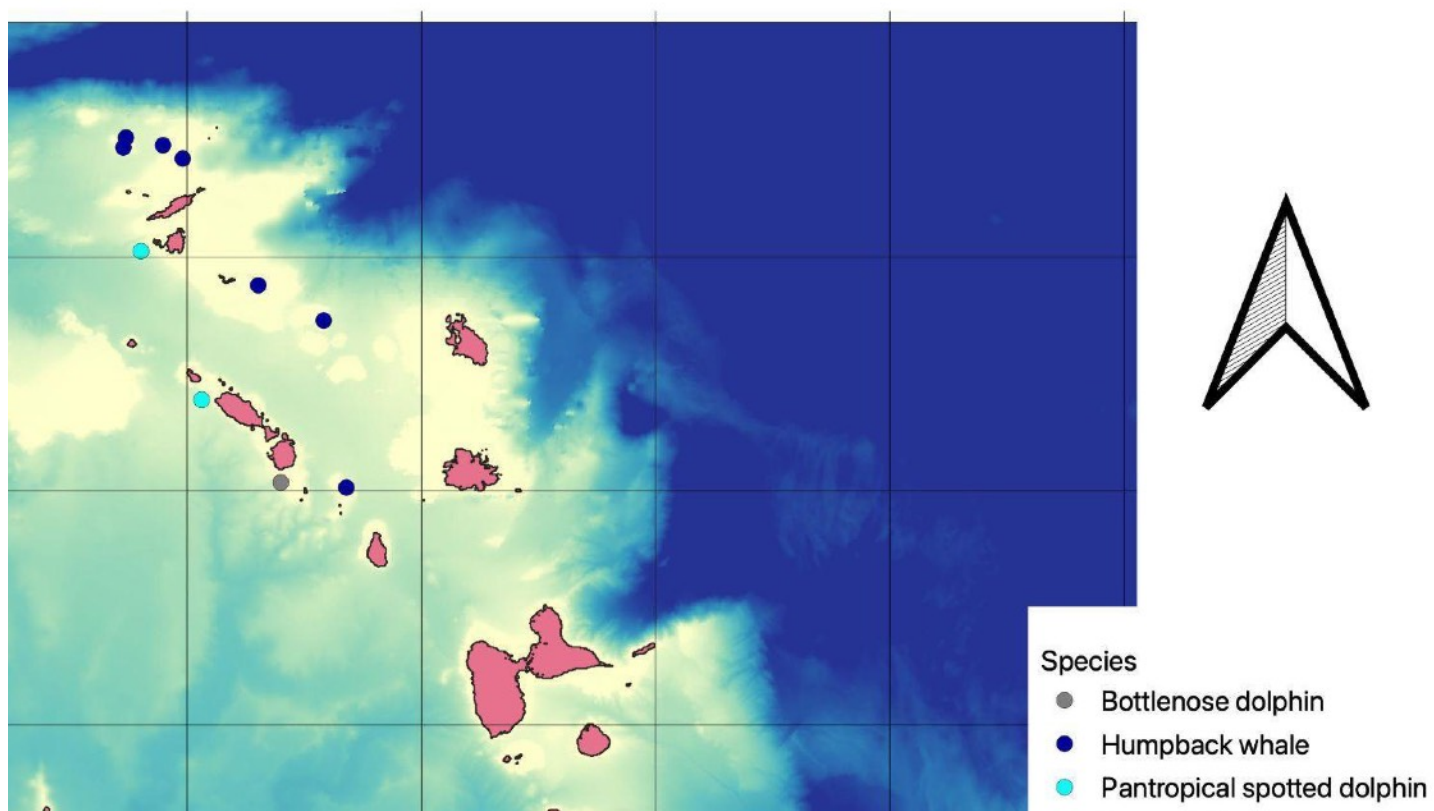


Figure 4: Confirmed cetacean sightings during Expedition 3.

Seabird Species Monitored :

As seabird species were not the primary focus during the 2023 expeditions, the protocol for monitoring them is still under development. Various methodological approaches were tested, but bird sightings were not systematically conducted during the cetacean research. It's important to note that most observation numbers in the results represent underestimations; however, they provide valuable preliminary data for trend comparisons and species diversity assessments. During this expedition, none of the crew members possessed a strong background in seabird identification and diversity within the Lesser Antilles hence, there is a possibility that some species may have been misidentified or remain unidentified. These species include:

- Royal Tern (*Thalasseus maximus*)
- Red-Billed Tropicbird (*Phaethon aethereus*)
- Brown Noddy (*Anous stolidus*)
- Laughing Gull (*Leucophaeus atricilla*)
- Magnificent Frigatebird (*Fregata magnificens*)
- Brown Booby (*Sula leucogaster*)
- Red-footed Booby (*Sula sula*)

Table 2: Seabird sightings recorded during expedition 3 of 2023.

Species	Nbr of observation (Obsenmer)
Royal Tern	1
Red-Billed Tropicbird	1
Brown Noddy	23
Laughing Gull	6
Magnificent Frigatebird	56
Red-footed Booby	10
Brown Booby	119



Magnificent frigatebirds (*Fregata magnificens*).

Seabird sighting maps :

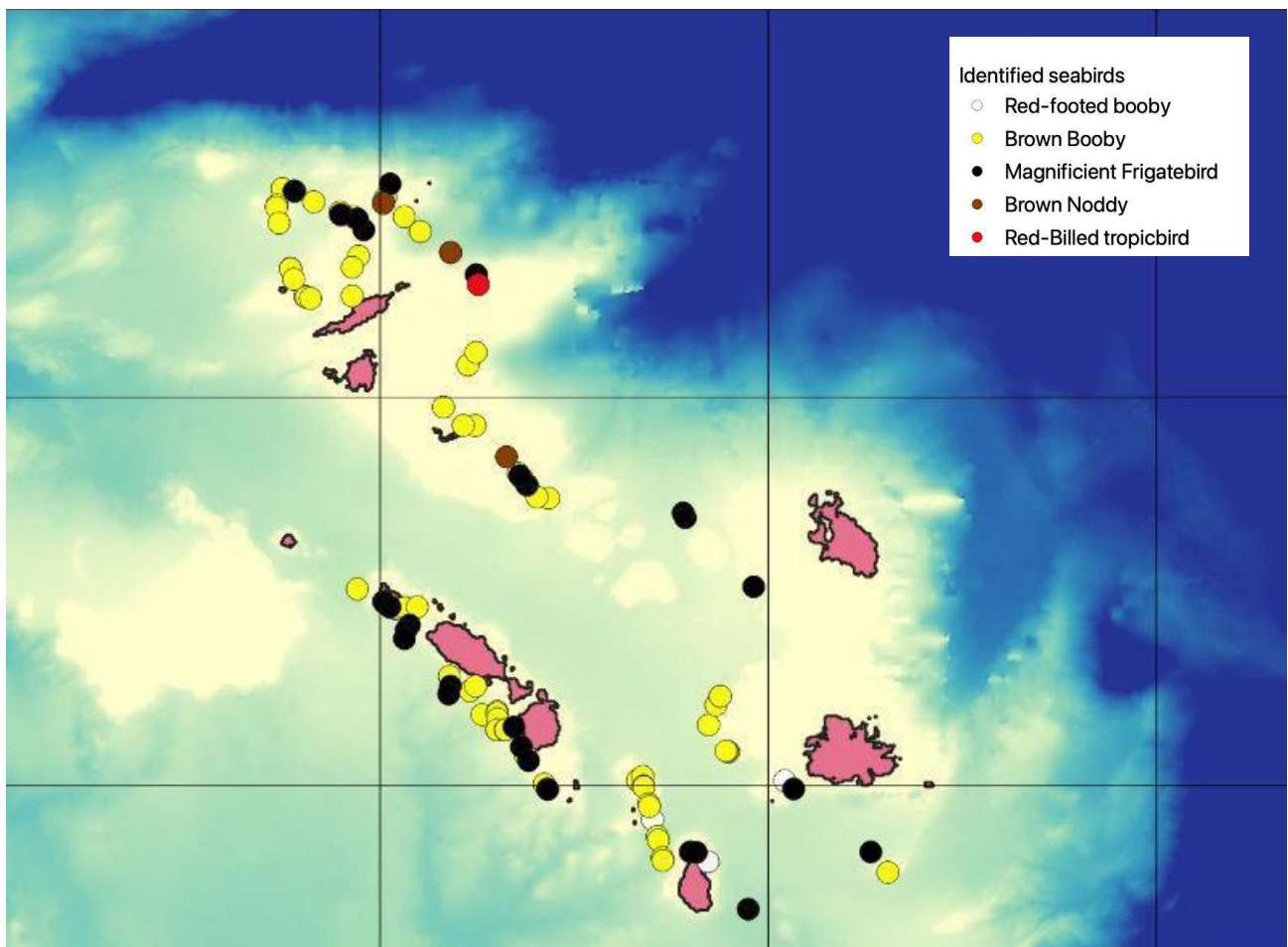


Figure 5: Maps of sightings of seabirds recorded during expedition 3 of 2023.

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 instills 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 Syam Nath, the Director of the newly established Trinidad & Tobago Cetacean Sighting Network, implement the "Ti Whale An Nou" methodology in their region. Furthermore, Yoan Doucet, a past participant of the 2022 expedition, has expressed his interest in collaborating with the CCS to create a joint project.

Finally, the diverse composition of the six-member crew on the third expedition of 2023, including representatives from various Caribbean islands and different professional backgrounds, highlights the program's ability to unite all participants. 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.



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, was seen the first-ever sighting for CCS of pantropical spotted dolphins on the west coast of St. Maarten. This breakthrough underscores the program's role in continually uncovering new insights about the region's cetacean populations.



Pantropical spotted dolphin (*Stenella attenuata*) in the northern islands

Impact on Conservation

The “Ti Whale An Nou” expeditions, including Expedition 3, 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 multi-year 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 contribute to help 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. The program's commitment to a diverse team, encompassing biologists, researchers, physiotherapists, and nurses, 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.



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 scientific permits for the French islands. On this occasion, it impeded our ability to gather data on pygmy killer whales in French territories while passing in front of Martinique while sailing toward the northern islands. This lack of support in a marine mammal sanctuary for noninvasive standardized research without any clear reason is having a negative impact on the conservation of endangered species.

The Caribbean region's weather and environmental factors pose 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.

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 Parks were able to join the expedition. This necessitated the recruitment of additional, non-experienced participants to ensure the success of our survey. We hope that Marine Parks can help us in the future to secure funding to help them participate.

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), and Corail Caraibes; 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 the captain.

The Caribbean Cetacean Society team

Science & conservation together !

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