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## WHITE PAPER

### **BEYOND BORDERS PROTECTION THE NORTH ATLANTIC HUMPBACK WHALE SISTER SANCTUARY PROGRAM**

**A Strategy for Advancing Humpback Whale Conservation and Transboundary Management  
October 2016**

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# BEYOND BORDERS PROTECTION

## THE NORTH ATLANTIC HUMPBACK WHALE SISTER SANCTUARY PROGRAM

A Strategy for Advancing Humpback Whale  
Conservation and Transboundary Management

October 2016



NATIONAL MARINE  
SANCTUARIES  
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## EXECUTIVE SUMMARY

The North Atlantic Humpback Whale Sister Sanctuary Program (NAHW-SSP) was established to facilitate the effective management of a *shared* population of protected humpback whales (*Megaptera novaeangliae*) across jurisdictional boundaries throughout its migratory range, from feeding and nursery grounds in the U.S. Gulf of Maine to breeding and calving areas in the Caribbean.

Stellwagen Bank National Marine Sanctuary (SBNMS, USA) initiated the NAHW-SSP in 2006. To date, NAHW-SSP includes four other countries — Dominican Republic, Bermuda, the French Antilles and the Caribbean Netherlands — and is a pioneering program in support of the United Nations Environment Programme's Specially Protected Areas and Wildlife's Marine Mammal Action Plan for the Wider Caribbean Region (UNEP/SPAW-MMAP). The initiative has forged the marine mammal protected areas network (MaMPAN est. 2015), the first such international partnership in the world protecting one of the ocean's most iconic species throughout its North Atlantic migratory range.

The multi-sanctuary, science-based program has increased the area of protection for North Atlantic humpback whales from 638 nm<sup>2</sup> in SBNMS (2180 km<sup>2</sup>) to 193,710.378 nm<sup>2</sup> (669,429 km<sup>2</sup>) total area of sanctuaries combined over the past ten years, making it one of the largest networks of coordinated marine mammal conservation areas in the world. As additional sites join, this chain of sister sanctuaries will help to ensure a safer future for the North Atlantic's humpback whales.

This successful collaboration was achieved through education, conservation and science exchanges and by improving communications, aligning priorities, and enhancing resource-sharing between sister sanctuary partners/nations, with support and involvement from more than 60 national and international agencies as well as other levels of government and a wide array of non-governmental partners (NGO).

The NAHW-SSP's vision is the successful implementation of an international transboundary management plan that protects humpbacks whales throughout the North Atlantic Ocean Basin. The vision is guided by multiple countries' commitment to: 1) advance an ecosystem-based approach to cooperative sanctuary management of humpback whales through capacity building, research, monitoring and education; 2) function as a model to elevate national and international awareness of the importance of the ecological connection between these marine mammal protected areas; 3) emphasize the critical need to take a broader management view toward transboundary conservation of marine mammal species; and, 4) promote a strategy that defines emerging problems beyond individual nations' Exclusive Economic Zones. The NAHW-SSP kindles commitment to critical habitats, ignites community engagement, and manifests the true spirit of regional cooperation, which is a key element to ensure effective management for biodiversity protection and the conservation of transboundary marine mammal species.

The implementation of NAHW-SSP's mission provides a model for leadership to catalyze action and link assets and resources of governments/nations, intergovernmental organizations and NGOs to focus attention on the need to manage and protect humpback whales beyond their national borders.

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BEYOND BORDERS PROTECTION  
THE NORTH ATLANTIC HUMPBACK WHALE SISTER SANCTUARY PROGRAM

A Strategy for Advancing Humpback Whale  
Conservation and Transboundary Management

**I. REGIONAL AND GLOBAL CONTEXT**

One of the primary missions of NOAA's Stellwagen Bank National Marine Sanctuary (SBNMS) is to conserve, protect and enhance the biological diversity of the sanctuary. An important component of that biodiversity is the Gulf of Maine (GoM) population of approximately 1,000 humpback whales (*Megaptera novaeangliae*), many of which frequent the sanctuary during part of the year. Each year this population migrates between their summer feeding and nursery grounds in the nutrient-rich waters of SBNMS and their winter mating and calving areas in the tropical waters of the Caribbean.

Since the pigmentation markings and scars on humpback tail flukes are unique to each whale, the humpback population is monitored by matching current photographs with the North Atlantic Humpback Whale Catalog (NAHWC) of fluke images and sighting information maintained since 1976 by Allied Whale at the College of the Atlantic in Maine. Information collected for humpbacks in the SBNMS (GoM) constitutes one of the longest and most detailed data sets for baleen whales in the world.

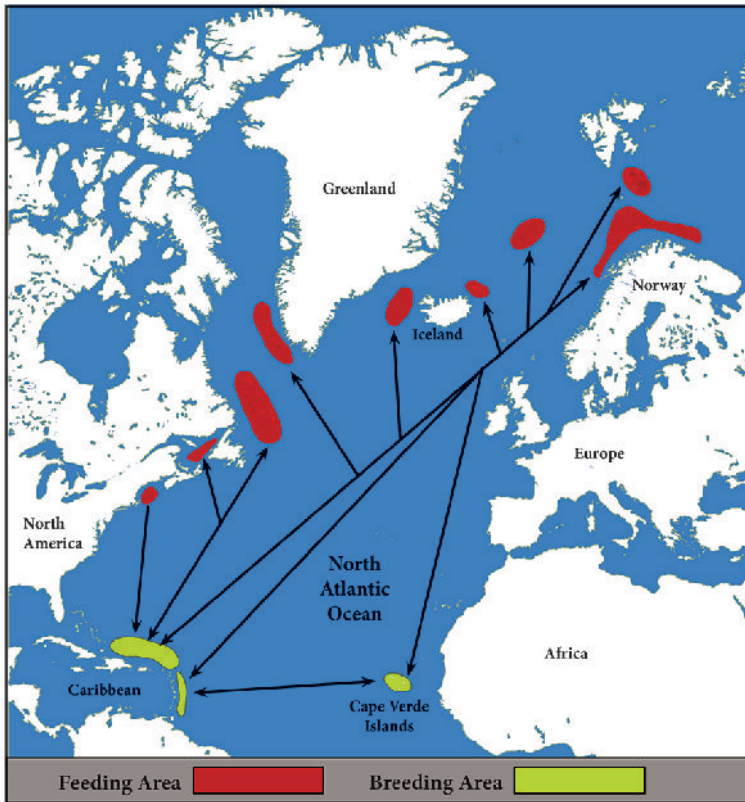
International scientific studies in 1992 and 2004<sup>1</sup> confirmed that humpback whales throughout the North Atlantic demonstrate a high degree of site fidelity to their northern feeding grounds, and return each fall and winter to mix with other groups in Caribbean waters to breed and calve (Map 1). Confirmation of these critical habitat areas and respective migratory corridors<sup>2</sup> offers a path toward improving long term conservation by increasing protection of the shared population of humpbacks, both within SBNMS and when they leave the sanctuary and return to the Caribbean.



*When a humpback named "Salt" was photographed in the sanctuary in 1975 and in Silver Bank off the Dominican Republic in 1979, it confirmed the migration path between SBNMS and the Caribbean.*

<sup>1</sup> *Years of the North Atlantic Humpbacks (YoNAH), 1992-1993 study of North Atlantic humpback whales across their entire ocean range. More North Atlantic Humpbacks (MoNAH), 2004-2005 study of North Atlantic humpback whales in the Gulf of Maine and on Silver Bank off the Dominican Republic.*

<sup>2</sup> *Transboundary Migratory Corridors: 'areas of land and/or sea in two or more countries, which are not necessarily contiguous, but are required to sustain a biological migratory pathway, and where co-operative management has been secured through legal or other effective means'.*



Map 1. Humpback Whale Migration Range in the North Atlantic (Source: SBNMS)

Humpback whales migrate between the waters off the Antilles where they spend the winter months and summer feeding areas in the Gulf of Maine, off eastern Canada, west Greenland, around Iceland, and northwest into the Barents Sea (Norway).

Recent data from the NAHW-SSP demonstrates that some animals from the eastern feeding areas migrate to the Cape Verde Islands and the Eastern Caribbean. Since they are rarely seen in the open ocean, we know little about the routes they follow between these areas.

Recognizing the need to increase protection year round for North Atlantic humpbacks, SBNMS initiated a conservation program for strategic, science-based relationships among nations situated throughout their migratory range. Since international transboundary protection requires formal large-scale planning, SBNMS established a Sister Sanctuary Program (SSP) within the framework of the United Nations Environment Programme's (UNEP) Caribbean Environment Programme (CEP). The first Sister Sanctuary partnership was established between SBNMS and the Dominican Republic in 2006. It is the *world's first* such linkage protecting elements of the same population of a migratory marine mammal species on both ends of its range.

Since then, SBNMS has established Sister Sanctuary relationships with the French Antilles (2011), Bermuda (2012) and the Caribbean Netherlands (2016), expanding the area conserved for prescribed protection of humpback whales from 638 nm<sup>2</sup> (2180 km<sup>2</sup>) when SBNMS was designated in 1992, to total accumulation area of 193,710.378 nm<sup>2</sup> (669,429 km<sup>2</sup>) in 2016. An ongoing program priority is to develop additional Sister Sanctuary relationships in countries sharing elements of this population of humpback whales (Map 3).



Expanded protection depends foremost on scientifically based, informed marine policy decisions. Success also depends heavily on changing social and political will; connecting with citizens through education and outreach programs to gain appreciation of these animals, and help citizens understand and support changes within their own countries.

Ongoing challenges for the Sister Sanctuary Program include establishing and maintaining cooperation and collaboration among many nations, each with its own sovereign rights, separate conservation agenda, languages and culture; expanding shared information and scientific research techniques; and, increasing available information about specific or preferred breeding areas for this shared population, particularly in remote/under-surveyed areas of the Eastern Caribbean region.

The following sections describe the North Atlantic Humpback Whale Sister Sanctuary Program, its benefits and its challenges.



Map 2. North Atlantic Humpback Whale Sister Sanctuaries (Source: SBNMS)

The multi-sanctuary, science-based program has increased the area of protection for North Atlantic humpback whales from 638 nm<sup>2</sup> in SBNMS (2180 km<sup>2</sup>) to 193,710.378 nm<sup>2</sup> (669,429 km<sup>2</sup>) total area of sanctuaries combined over the past ten years, making it one of the largest networks of coordinated marine mammal conservation areas in the world.

## I. LEGAL AND ORGANIZATIONAL FRAMEWORK

Transboundary protection for humpbacks migrating between Stellwagen Bank National Marine Sanctuary (SBNMS) and the Caribbean is complex. The Wider Caribbean Region (WCR) represents approximately 1,164,724 nm<sup>2</sup> (4,000,000 km<sup>2</sup>) and some 36 states and territories, each with sovereign rights, separate conservation agendas and political priorities based on socio-economic issues. These countries share at least 32 recorded marine mammal species that have significant ecological, aesthetic and economic value to the region, which increases incentives and opportunities for cooperation (Ward and Moscrop, 1999).

Success in managing and conserving humpback whales ultimately depends on countries' commitment to building internal capacities and implementing regional guidelines that establish priorities, standards, and strategies for conservation, education and sustainable livelihoods. The framework for developing sister sanctuaries has been established within a series of progressively more detailed legally-binding

agreements for increasing international cooperation; primarily UNEP's Cartagena Convention<sup>3</sup> and its Protocol Concerning Specially Protected Areas and Wildlife (SPA) in the WCR, which became international law in 2000. In 2008, member governments of the Cartagena Convention developed and adopted an Action Plan for the Conservation of Marine Mammals in the Wider Caribbean Region (MMA-WCR) (Ward, 2005). The plan identifies specific threats and suggests implementation timetables for both national and regional level priority actions (Figure 1).

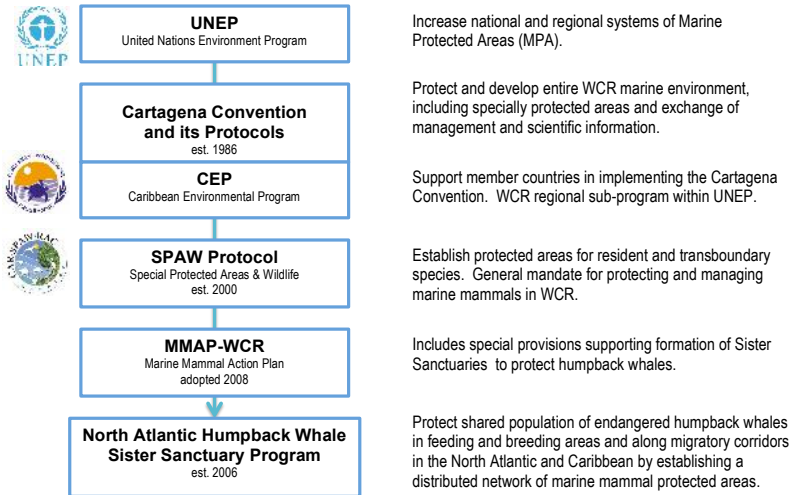


Figure 1. Sister Sanctuary Program Legal and Organizational Framework (Source: SBNMS)

A specific request under Marine Protected Areas in "actions needed" of the MMA-WCR (section 2.4.1/2008) is to "... design marine protected areas and other management regimes that maintain ecological connections between MPAs in order to satisfy species' requirements, including "sister sanctuary" relationships that promote protection for transboundary assets". (Ward, 2005; UNEP, 2008).

<sup>3</sup> The Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region (WCR) or "Cartagena Convention" is a comprehensive, umbrella agreement for the protection and development of the marine environment. The Convention was adopted in Cartagena, Colombia on 24 March 1983 and entered into force on 11 October 1986, as the legal framework of the Action Plan for the Caribbean Environment Programme (CEP) and for cooperative regional and national actions in the WCR. The Convention is supported by three additional technical agreements or Protocols, including one on Specially Protected Areas and Wildlife (SPA). This Secretariat (or Regional Coordinating Unit) is based in Kingston, Jamaica. In addition, a Regional Activity Centre (RAC) in Guadeloupe serves the SPAW Protocol of the Cartagena Convention. Although Bermuda is not located within the geographic context of the Cartagena Convention, its sister sanctuary status recognizes it as a migratory corridor for the same population of humpback whales.

### III. HISTORICAL CONTEXT: OBJECTIVES, REQUIREMENTS AND TIMELINE

In the years leading up to 2006, Stellwagen Bank National Marine Sanctuary (SBNMS) initiated the concept of a conservation program for developing strategic, science-based sister sanctuary relationships. The North Atlantic Humpback Whale Sister Sanctuary Program (NAHW-SSP) that ultimately resulted has three goals:

- Ensure protection of a shared population of humpback whales outside of U.S. borders through a unified network of marine mammal sanctuaries with specific focus on international breeding and mating grounds in the Caribbean, feeding and nursery grounds in SBNMS (Gulf of Maine), and along migration corridors (i.e. Bermuda).
- Identify and reduce man-made impacts throughout the migration range.
- Develop and implement the first framework for transboundary management and protection for humpback whales in the North Atlantic and Caribbean.

Requirements for a sister sanctuary partnership include a shared population of humpback whales, and establishment of a formally designated Marine Mammal Sanctuary (MMS) as prerequisites to signing a sister sanctuary agreement.

- In December 2006, NOAA's National Oceanic Service (NOS) and the Dominican Republic's Ministry of the Environment and Natural Resources signed a Memorandum of Agreement (MOA) to establish the world's first sister sanctuary linkage protecting an endangered migratory marine mammal species on both ends of its range, between SBNMS and El Santuario de Mamíferos Marinos de la República Dominicana (SMMRD). SMMRD includes Samana Bay, Silver Bank and Navidad Bank encompassing 36,000 km<sup>2</sup>. The MOA was renewed in 2011 and 2016 (until 2021).

The collaborative learning curve associated with establishing the first sister sanctuary partnership helped accelerate additional partnerships (Figure 2).

- In 2011, NOAA's Office of National Marine Sanctuaries (ONMS) and France's Marine Protected Areas Agency signed a MOA to protect endangered humpback whales that migrate annually between SBNMS and the Agoa Marine Mammal Sanctuary (MMS) in the French Antilles. This area of 143 256 km<sup>2</sup> includes the territorial waters and Economic Exclusive Zone (EEZ) surrounding the 'French West Indies' and the islands of Guadeloupe, Martinique, Saint Martin and Saint-Barthélemy at the Caribbean's eastern edge. The MOA was renewed in 2014 until 2020.
- In 2012, a MOA was signed between NOAA's ONMS and the Government of Bermuda establishing a MMS encompassing 464,993 km<sup>2</sup> of territorial waters and EEZ to protect humpback whales along the migratory corridor between SBNMS and the Caribbean.
- In 2015, the Caribbean Netherlands established the Yarari MMS encompassing 23,000 km<sup>2</sup> of the territorial waters as well as the Exclusive Economic Zone surrounding the islands of Saba and Bonaire. SBNMS and the Caribbean Netherlands have worked under a sister sanctuary Letter of Agreement since 2011; formal plans for a Sister Sanctuary MOA are expected in 2016.

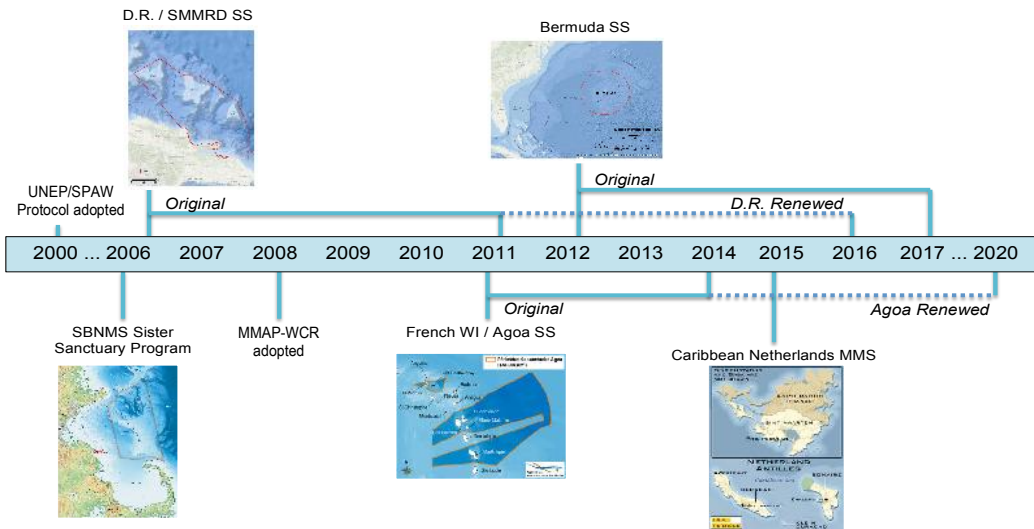


Figure 2. Evolution of North Atlantic Humpback Whale Sister Sanctuary Program (Source: SBNMS)

#### IV. PLANNING FRAMEWORK

Within the regional context of the Marine Mammal Action Plan for the Wider Caribbean Region (MMAP-WCR), countries may address their own specific priority issues and species by developing and implementing National Marine Mammal Action, Management and/or Recovery Plans.

In collaboration with UNEP-SPAW and member countries, the sister sanctuary planning framework identifies resources and training needs for developing these plans as they relate to humpback whale protection. This planning framework also included participation in UNEP’s LifeWeb Project<sup>4</sup> to work toward the goal of developing transboundary management of the shared population of humpback whales in the WCR and SBNMS/Gulf of Maine. As the first step taken under this framework, SBNMS initiated and facilitated a demonstration project (2011-2012) leading to the development of SMMRD’s Management Plan (2015), supported and funded by UNEP/LifeWeb project (Figure 3).

<sup>4</sup> LifeWeb funding supports the implementation of the Convention on Biological Diversity (CBD)’s Program of Work on Protected Areas, in particular through technical support in establishing comprehensive, effectively managed, and ecologically representative regional systems of marine protected areas in countries of Latin America, the Caribbean and neighboring regions. Accomplishments of the LifeWeb Project include development of marine spatial planning and scenario building for marine mammals’ migration corridors in order to enhance trans-boundary management. This process included regional training information integration and mapping, and networking together with specific demonstration activities, bringing together national planners, managers and experts, and institutions in a range of mutually supporting activities. This resulted in integrated maps of marine mammal (MM) species richness, distribution, threats and socio-economic aspects in the Wider Caribbean Region.

Creation of the Sister Sanctuary Program in the North Atlantic and Caribbean has led to the establishment of the world's first international Marine Mammal Protected Area Network (MaMPAN), formally established in 2015 at the UNEP-SPAW Sister Sanctuary Program Partner's Meeting, St. Maarten (Caribbean Netherlands).

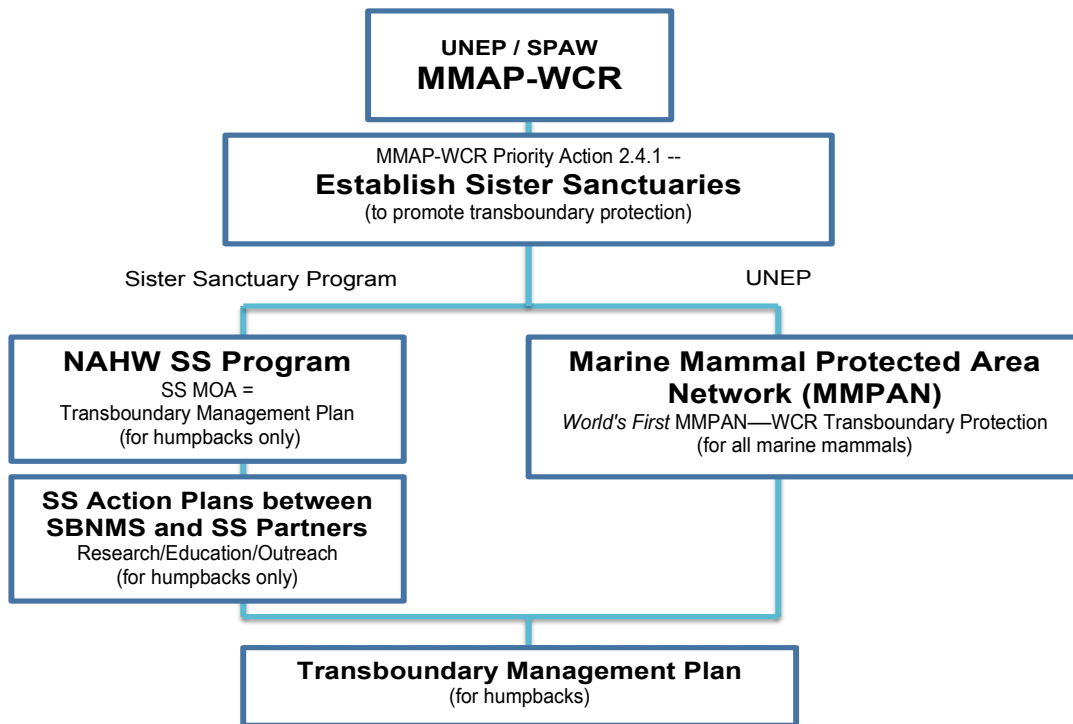


Figure 3. Sister Sanctuary Program Planning Framework (Source: SBNMS)

Individual action plans for research and/or education were developed between SBNMS and the Marine Mammal Sanctuary of the Dominican Republic/SMMRD, the Agoa/French Antilles and Yarari/Caribbean Netherlands. Joint planning helps coordinate sister sanctuary activities and elevates experience among sister sanctuary partners. Action plans are developed within the framework of UNEP/SPAW's Marine Mammal Action Plan (Figure 4).

NORTH ATLANTIC HUMPBACK WHALE SISTER SANCTUARY PROGRAM

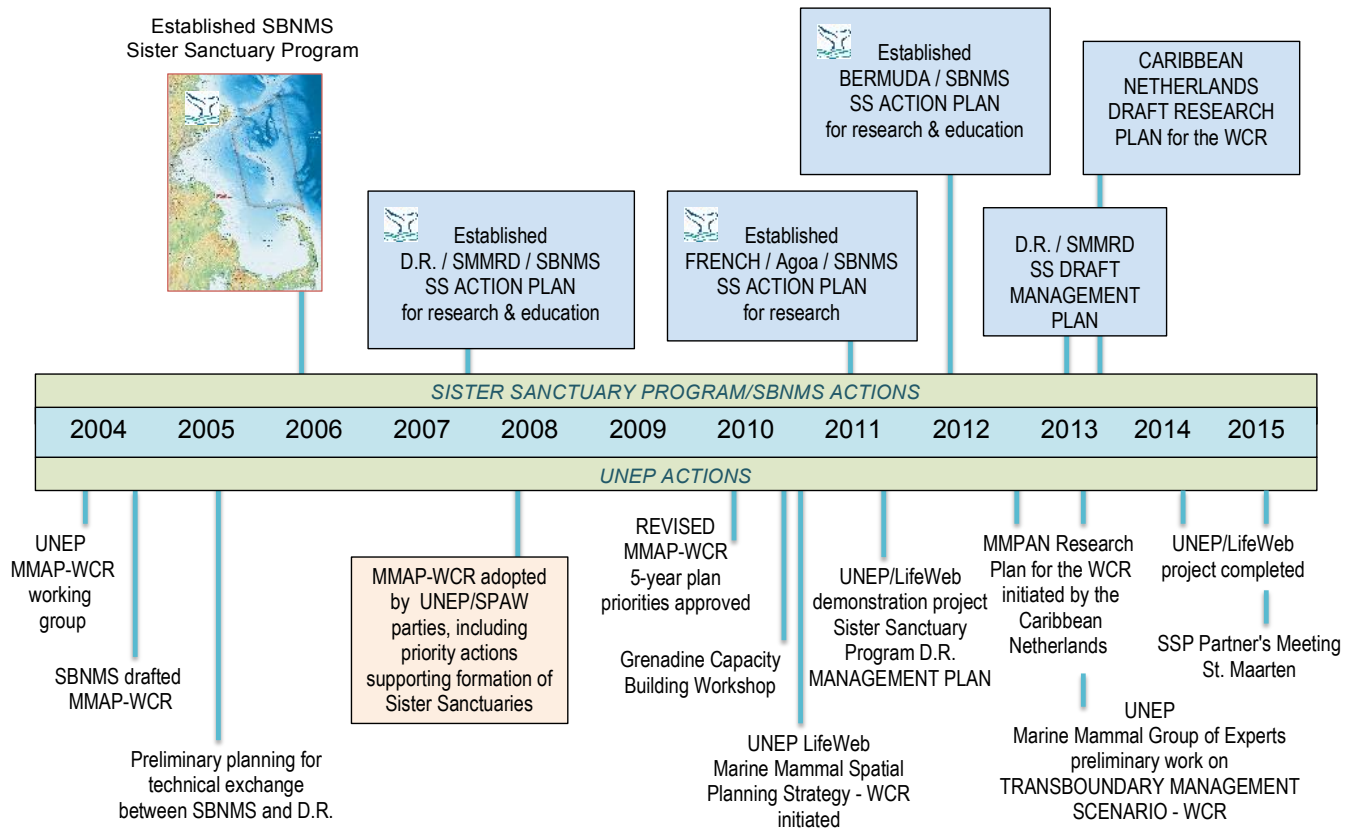


Figure 4. Sister Sanctuary Program Planning Timeline (Source: SBNMS)

Transboundary conservation (aka NAHW-SSP) is both about protecting nature and about promoting cooperation among people of different nations. The NAHW-SSP can facilitate species and ecosystems protection, and help communities come together, connect people of different cultural and ethnic backgrounds, stimulate social and economic benefits, strengthen political relations and effectively address the challenges that are specific to transboundary conservation.

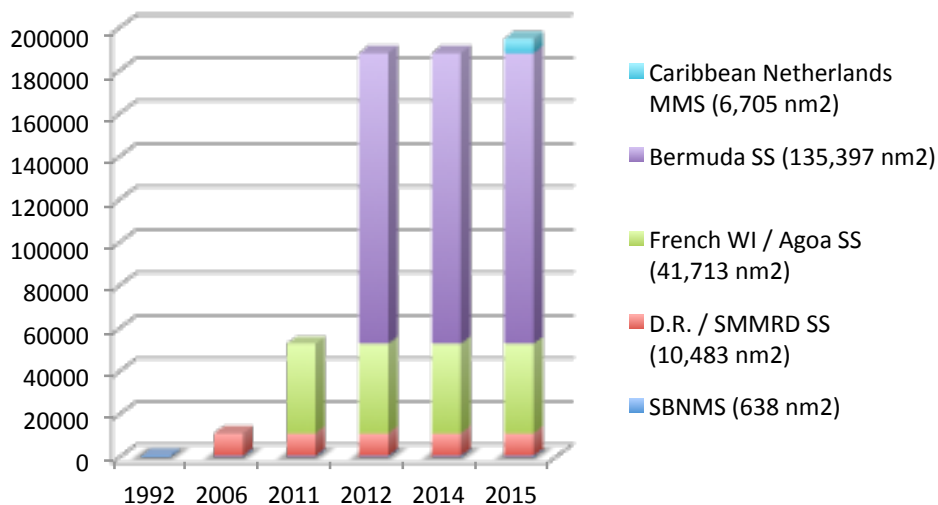
V. BENEFITS TO DATE

The North Atlantic Humpback Whale Sister Sanctuary Program (NAHW-SSP) is a catalyst for action and change, increasing connections and leveraging resources among partner organizations. In that context, SBNMS and sister sanctuary partners have been steadily working toward creating informed marine mammal policy strategies and decisions that expand humpback whale protection, with strategic emphasis on planning, research, education and outreach, and changing social and political will through heightened understanding and community engagement (Appendix B). As importantly, the NAHW-SSP advances the importance of environmental literacy, outreach, and education, accentuates state-of-the-art research, highlights the benefits of international cooperation and collaboration and underscores the need for organizational excellence.

### A. EXPANDED PROTECTION BEYOND BORDERS

During the past two decades, awareness of marine mammals and their habitats in the Wider Caribbean Region (WCR) has increased. Because a sister sanctuary partnership requires establishing a MMS that includes protection for humpback whales, the addition of each country to the NAHW-SSP adds area cumulatively to the coordinated and distributed network of protection for this endangered transboundary marine mammal species (Figure 5).

The area conserved for prescribed protection of humpback whales has expanded from 638 nm<sup>2</sup> (2,180 km<sup>2</sup>) when SBNMS was designated in 1992, to 194,936 nm<sup>2</sup> (699,429 km<sup>2</sup>) in 2015 with the inclusion of the Dominican Republic (SMMRD), the French Antilles (Agoa MMS), Bermuda territorial waters and EEZs, and Yarari MMS/Caribbean Netherlands (Map 2).



**Figure 5. Area of Sister Sanctuary Program Expanded Protection for Humpback Whales (nm<sup>2</sup>)** (Source: SBNMS)

### B. INFRASTRUCTURE AND CAPACITY BUILDING FOR TOURISM DEVELOPMENT AND CONSERVATION EDUCATION IN THE WIDER CARIBBEAN REGION

Added value among sister sanctuary partners comes through creating or improving management, and sharing knowledge, experience and resources to build technical and educational capacity. Specific capacity-building initiatives include eco-tourism development and outreach programs, publications and exhibits, international conferences, working groups, workshops, training and informal education.

SBNMS conceived, initiated and led several sister sanctuary initiatives that are designed to accelerate the outreach and education that ultimately influence policy decisions related to humpback whale protection throughout the WCR:

- Capacity for Conservation (CC) (formerly the AMIGOS Intern Exchange Program): Sponsors Caribbean university students to assist sister sanctuary research and education partners on projects aboard whale watch and research vessels within SBNMS.



- *Grenadine Capacity Building for Establishment of Marine Mammal Protected Areas:*  
Provides management capacity-building support for the development of expanding the marine mammal protected areas network (MaMPAN) in the Eastern Caribbean Region. The capacity building program promotes the conservation and economic benefits of establishing MMPAs and delineates an overview of the process and framework necessary for its implementation.
- *Jump With Whales Education and Engagement Campaign:*  
A multi-national sister sanctuary education and awareness-raising initiative for the WCR. Conceived and initiated by SBNMS, the project is a collaboration between SBNMS, sister sanctuary partners and UNEP-SPAW within the framework of the MMAP (Appendix C).
- *CARIB Tails:*  
An internet-based citizen science initiative enlisting recreational sailors (i.e., cruisers and yachters) to help track the movements of humpback whales between their North Atlantic feeding grounds and their Caribbean breeding grounds by photographing the distinct patterns on the tail flukes of humpback whales in their West Indies breeding grounds. Photo-identification helps monitor the recovery of this endangered species. The project is an international research collaboration between Stellwagen Bank National Marine Sanctuary (SBNMS) and its sister sanctuary partners, together with UNEP's Caribbean Environment Programme and SPAW. {Website address: [www.caribtails.org](http://www.caribtails.org)}

Outputs that serve as models or that can be shared among sister sanctuary partners expand consistent messaging for outreach and education initiatives. Items produced to date include the NAHW-SSP/SBNMS website, more than 20 NAHW-SSP fact sheets, 10 publications/exhibits and the CARIB Tails website.

Coordinating with the work of other international organizations, and increasing exposure through participation in international conferences, leverages the success of the NAHW-SSP. Exposure to date includes active participation and presentations at 30+ international meetings, and participation in three UNEP-SPAW working groups.

Seventeen workshops (all funded via SSP partners) have provided a productive vehicle for sharing expertise and information among sister sanctuary partners. Some workshops are sponsored and provided directly through the NAHW-SSP; others are the result of collaboration and participation with other organizations sharing similar goals and objectives (Appendix B).

### C. SCIENTIFIC COLLABORATION

One of the earliest benefits realized among sister sanctuary partners is sharing research techniques/protocols and scientific information. Areas of consultation and collaboration with SMMRD, Agoa and Yarari include marine spatial planning and mapping, humpback whale photo-identification studies, satellite and acoustic tagging, and collaborative research planning for baseline studies and technical exchanges.

For nearly four decades, the North Atlantic Humpback Whale Catalog (NAHWC) has provided a central database for individual identification photographs of humpback whales collected across the North Atlantic Ocean (Katona and Beard, 1990). The NAHWC has ocean-basin-wide coverage, including photographs from every known major feeding and breeding area in the North Atlantic. This makes it uniquely suited to address large-scale movement patterns and population dynamics. The NAHW-SSP addresses questions of population size, distribution and migration that can only be answered in a longitudinal manner and by the collaboration of many scientists willing to contribute

their data to this central catalog. As such, the NAHWC has contributed substantially to our understanding of humpback whale ecology in the North Atlantic.

The NAHW-SSP partners have contributed substantially to growth in the sample from the Eastern Caribbean (EC). The work (Stevick *et al.*, 2015) reported here more than doubles the number of individuals in the NAHWC database that have been identified in these waters, bringing the total to 123 from this remote and previously under-sampled area. Although, until recently, there has been limited work dedicated to studying on humpback whales in these waters, this area was the center of humpback whale catches in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries (Reeves *et al.*, 2001), and is the only region in which humpback whales continue to be killed in the aboriginal hunt at Bequia, St. Vincent and the Grenadines (Ward, 1996). The EC region is also the location of the Agoa marine mammal sanctuary and of recent work by the Caribbean Netherlands marine mammal initiative. All of these factors, along with some unanticipated findings from the area that are discussed below, make this a habitat of considerable interest.

Information submitted by the international citizen science initiative CARIB Tails and sister sanctuary research partners is used in mark-recapture studies to help monitor the recovery of this endangered species and offer new perspectives to the timing and movement patterns of humpback whales from the southeastern Caribbean. Recent data shows that the whales mating and calving in this region *are not* a representative subset of those that winter in the Dominican Republic. These analyses were compiled and presented to the Scientific Committee of the International Whaling Commission as paper SC/66a/AWMP2 (Stevick *et al.*, 2015).

These new findings raise management challenges, especially given the recent changes in listing status under the USA Endangered Species Act (ESA) that resulted in the West Indies breeding stock of humpback whales being de-listed from that Act. As a result of these finding related to breeding stock structure, NAHW-SSP research grants received in 2016/2017 (“Humpback Whales in the Southeast Caribbean”) will improve and expand our collaboration between NOAA’s National Marine Fisheries Service scientists and our counterparts working in the French and Dutch territories in the Caribbean to protect SBNMS humpback whales. Additional research projects (using standard acoustic, genetic and photo-ID techniques) with the Dutch TRANSCIENCE and French CARI’ MAM initiatives (2017-2020) will also result in a better understanding of the movements, habitat use and migratory destinations of humpback whales that breed in the southeastern Caribbean. This is particularly important, as it will substantially improve our knowledge of the humpback whale’s singular feeding grounds in the United States and clarify our understanding of the Distinct Population Segment (DPS) of Caribbean humpback whales that was recently de-listed is being considered for listing under the USA ESA.

## **VI. STRATEGY FOR ADVANCING HUMPBACK WHALE CONSERVATION — MOVING FORWARD**

The objective of the North Atlantic Humpback Whale Sister Sanctuary Program (NAHW-SSP) is to enhance cooperation and promote policy formulation for the conservation of humpback whales throughout the WCR by establishing MMPAs and signing subsequent sister sanctuary MOAs with countries in the WCR that are Parties to the SPAW Protocol, and to encourage non-SPAW Parties within humpback migration range to become part of Marine Mammal Protected Area Network’s (MaMPAN) NAHW-SSP. Map 3 (below) indicates countries (in bold) that have ratified the SPAW Protocol, all of which overlap humpback breeding and calving grounds in the insular Caribbean region.

In addition to existing sister sanctuary partners, it is expected that other Caribbean countries and territories share elements of the same population of humpback whales. These countries include Cuba, Haiti and Puerto Rico in the Greater Antilles and the Lesser Antilles island chain (Eastern Caribbean) including: Antigua and Barbuda, Barbados, St. Kitts and Nevis, Dominica, St. Lucia, St. Vincent and the Grenadines, Grenada and Trinidad and Tobago. We are working with these countries to engage policy directives toward marine mammal protection.

The NAHW-SSP is building on its success and momentum, and incorporating the experience gained to date through collaborating with partner organizations and governments. With an established legal framework in the WCR, marine mammal action plans, and model projects in place, individual activities to increase areas of protection and expand program resources and exposure are being designed by the NAHW-SSP and funded as part of a coordinated whole.



Map 3. Area of SPAW involvement in the Wider Caribbean Region (Source: UNEP)

#### A. SUPPORT FOR SPAW's MMAP-WCR

UNEP-SPAW's Marine Mammal Action Plan (MMAP) immediate goal is to assist participating governments in the region in developing and improving marine mammal policies and practices (UNEP-SPAW 2008). In light of the need to address a number of priority issues, SPAW's "MMAP

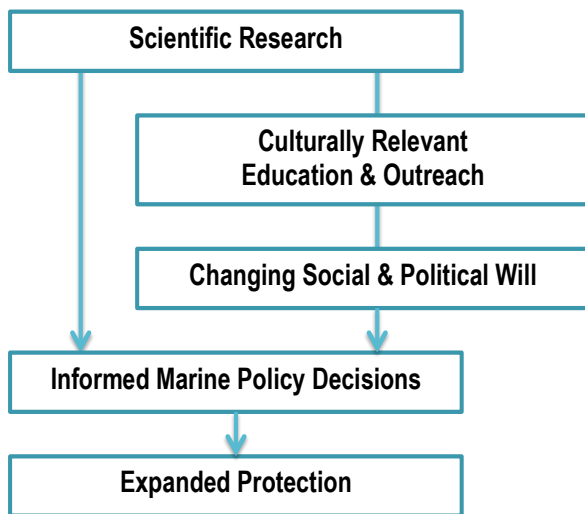
Priority Actions: Five-Year Plan” identifies actions to be executed as identified by Contracting Parties. The MMAP outlines ten priority issues, which include:

- Protected Areas and Other Management Regimes \*
- Research \*
- Whale Watching \*
- Acoustic Disturbance \*
- Vessel Strikes \*
- Fisheries Interaction (Entanglement) \*
- Marine Mammal Strandings \*
- Climate Change
- Habitats Degradation
- Pollution and Marine Mammal Health

SBNMS and NAHW-SSP has taken a leadership role or been a strong contributing partner to assist in convening workshops, modeling and mapping activities, capacity building and training for seven of the ten issues (as noted by \*) and related actions since the MMAP adoption by SPAW Parties in 2008. The remaining three items (i.e., Climate Change, Habitats Degradation, and Pollution and Marine Mammal Health) have not been addressed by the MMAP to date. The MMAP is intended to provide a framework for activities at the national and regional levels within a spirit of international cooperation and on the basis of respect for sovereign rights.

**B. STRATEGY FOR CHANGE**

The NAHW-SSP is a dynamic and evolving process. Expanded protection depends foremost on *scientifically based, informed marine policy decisions*. Success also depends heavily on *changing social and political will*; connecting with citizens through education and outreach programs to help them understand and support changes within their own countries. Since the Caribbean area embraces so many varied cultures, the NAHW-SSP is specifically designed to increase the probability of success through cultural relevancy. When fiscal means are available, outreach is provided in English, Spanish and French (Figure 6).



**Goals:**

- Insure protection of a shared population of humpback whales outside of U.S. borders by a unified network of marine mammal sanctuaries with specific focus on international breeding and mating grounds in the Caribbean, feeding and nursery grounds in SBNMS, and along migration corridors.
- Identify and reduce man-made impacts throughout the migration range.
- Develop and implement the *first* framework for managing transboundary protection for humpback whales in the North Atlantic and Caribbean via MaMPAN.

Transboundary conservation initiatives have the potential to deliver multiple goals: better biodiversity conservation outcomes; support for, and improved delivery of, ecosystem development and protection; the promotion of a transboundary cooperative framework for the day-to-day management of shared issues; and, encouraging and managing transboundary tourism.

The NAHW-SSP serves as a model for SPAW's Marine Mammal Protected Areas Network's transboundary management initiatives and potential transboundary conservation governance. Success will depend on an appropriate management investment. Next steps for NAHW-SSP may include the development of a common vision and framework for a NAHW-SSP 5-year Action Plan that will serve as the basis for developing cooperative management objectives for a future joint Humpback Whale Transboundary Management Plan to insure protection of sanctuary humpbacks throughout their migratory range. Potential ecological and socioeconomic benefits include:

- Ensuring the long-term persistence of viable population of North Atlantic humpback whales;
- Securing the survival of migratory species through cooperation in the management of essential wildlife habitats in range states;
- Building greater ecological integrity by increasing the size of the area under conservation management, reducing fragmentation and integrating ecosystem processes; and,
- Developing the potential to sustain livelihoods, contribute to national economies and support regional and global biodiversity conservation.

## VII. CONCLUSION

The success of the North Atlantic Humpback Whale Sister Sanctuary Program is achieved by improving communications, aligning priorities, and enhancing resource-sharing among sister sanctuary partners/nations, with support and involvement from a wide range of national and international agencies and authorities as well as research institutes and a wide array of non-governmental partners. In collaboration with UNEP-CEP/SPAW, the IUCN Green List of Protected Areas is a potentially useful initiative, which may be used as a monitoring and evaluation tool to measure the performance of transboundary conservation efforts.

Program partners have provided collective commitment and support (Appendix A). Their expertise and contributions are central to the success of this project.



*Photo credits (l to r): A.Friedlaender, J.Takaberry, D.Glockner-Ferrai, D.Cholewiak, WDC.*

## **APPENDIX A SISTER SANCTUARY PARTNERS**

The North Atlantic Humpback Whale Sister Sanctuary Program collaborates with and receives support from four UNEP programs including 71 NGOs and government organizations. Additionally, NAHW-SSP supports NOS's Caribbean Strategy Goal Areas including: a) Conservation and Management of Ocean and Coastal Ecosystems, and b) Resources and Strengthened Understanding of, and Adaptation to, Changing Climate; as well as three categories of the NOAA's International Science RFP; c) Addressing migratory stocks through bilateral and multilateral science cooperation; d) Conducting range-wide assessments on transboundary living marine resources with foreign partners; and e) Advancing science collaboration with international marine science organizations. Sister Sanctuary Program Governments include: USA, Bermuda, Dominican Republic, French Antilles and Caribbean Netherlands.

### INTERNATIONAL Programs (3)

The North Atlantic Humpback Whale Sister Sanctuary Program collaborates with and receives support from UNEP programs, partner NGOs and government organizations.

- United Nations Environment Programme (UNEP) Nairobi: Spain LifeWeb Project
- UNEP Caribbean Environment Programme (CEP) Regional Coordinating Unit (Kingston, Jamaica) (UNEP-CAR/RCU) Secretariat to Cartagena Convention and its Protocol Concerning Specially Protected Areas and Wildlife (SPAW)
- SPAW Regional Activity Centre (SPAW RAC, Guadeloupe, French Antilles)

### NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) (5)

- NOS Caribbean Strategy
- Office of National Marine Sanctuaries
- Marine Protected Areas (MPA) Research Center
- Northeast Fisheries Science Center (NEFSC): Protected Species Branch
- NOAA Fisheries International Affairs

### USA (9)

- Allied Whale, College of the Atlantic, Bar Harbor, ME
- Cape Cod Museum of Natural History (CCMNH), Brewster, MA
- Center for Coastal Studies (CCS), Provincetown, MA
- Cetacean Society International (CSI), Hartford, CT
- Dolphin Fleet Whale Watching, Provincetown, MA
- Martha Vineyard's Sister Island Council, MA
- Sailors for the Sea, Newport, R.I.
- SEA Education Association, Woods Hole, MA
- Whale and Dolphin Conservation (WDC), Plymouth, MA

DOMINICAN REPUBLIC (15)

- Aquatic Adventures (Puerto Plata, D.R.)
- Center for the Conservation and Eco-Development of Samaná Bay and its Surroundings (CEBSE)
- Fundación Dominicana de Estudios Marinos, Inc. (Foundation for Marine Studies) (Santo Domingo, FUNDEMAR)
- Fundacion Atemar Samana (ATEMAR)
- Institute of Technology (INTEC, Santo Domingo, D.R.)
- Ministry of the Environment and Natural Resource Santo Domingo
- Ministry of Biodiversity, Santo Domingo
- National Aquarium of the Dominican Republic, Santo Domingo
- National Museum of Natural History, Santo Domingo
- Samana Whale Museum
- Silver Bank Whale Watch Cooperative
- The Nature Conservancy (TNC)
- The Nautilus Group
- Universidad Autónoma de Santo Domingo (University of Santo Domingo) (UASD)
- Whale Samana Eco Tours

FRENCH ANTILLES (9)

- Agoa Marine Mammal Sanctuary
- Association Evasion Tropicale (Guadeloupe)
- CARIB Whale (Guadeloupe)
- Départementale de l'Environnement (DIREN), Guadeloupe, Martinique
- French Antilles Department of National Parks, Martinique
- Mon Ecole Ma Baleine (Guadeloupe)
- Observatoire des Mammifères Marins de l' Archipel Guadeloupeen (OMMAG)
- Réserve Naturelle St. Martin
- The French Marine Protected Areas Agency (AAMP), France
- Université des Antilles et de la Guyane (Pointe-à-Pitre, Guadeloupe)

BERMUDA (3)

- Ministry of the Environment, Planning and Infrastructure Strategy
- Sargasso Sea Alliance
- Bermuda Whale Foundation

CARIBBEAN NETHERLANDS (17)

- Aruba Marine Mammal Foundation (AMMF)
- Conservation Policy and Planning Division Ministry of Public Health and Social Development, Department of Environment and Nature (MINA)
- Dive Saba
- Dutch Caribbean Cetacean Network (Curacao, DCCN)
- Dutch Caribbean Nature Alliance (Bonaire, DCNA)
- Institute for Marine Resources and Ecosystem Studies (Holland, IMARES)
- Nature Foundation

## NORTH ATLANTIC HUMPBACK WHALE SISTER SANCTUARY PROGRAM

- Saba Conservation Foundation
- Saba National Marine Park (Saba)
- Sea Saba Dive Center
- St. Eustatius National Park
- St. Eustatius Marine Park (STENAPA)
- St. Maarten Nature Foundation
- Ministry of Economic Affairs
- University of Groningen, Netherlands
- World Wildlife Fund Netherlands
- Yarari Marine Mammal Sanctuary

## EASTERN CARIBBEAN (19+)

- Action Bequia, St. Vincent and the Grenadines (SVG)
- Antigua's Environmental Awareness Group
- Barefoot Bareboat Yacht Charters, SVG
- Bequia Maritime Museum, SVG
- Bequia Sailing Club, SVG
- Bequia Tourism Association, SVG
- Caribbean COMPASS, SVG
- Eastern Caribbean Coalition for Environmental Awareness (Martinique, ECCEA)
- Eastern Caribbean Cetacean Network (St. Vincent and the Grenadines, ECCN)
- Environmental Awareness Group (Antigua)
- Friends of the Tobago Cays, SVG
- Mustique Environmental Trust, SVG
- St. Vincent and the Grenadines Sister Island Council Diaspora
- St. Vincent and the Grenadines National Trust
- The St. Vincent and the Grenadines Preservation Fund
- University of the West Indies (Barbados)
- University of the West Indies (Trinidad and Tobago)
- WIDECAST (Barbados)
- Charter companies and yachting/sailing clubs throughout the Eastern Caribbean



## APPENDIX B SCIENCE AND OUTREACH

### SCIENTIFIC COLLABORATION

- Acoustics research, ambient and vessel noise and its impact (*D.R. 2010*).
- Satellite tagging (*D.R. 2011-2012*).
- Marine spatial planning/mapping (WCR and migration corridors; *LifeWEB 2010-2014*).
- *R/V Song of the Whale* joint humpback tagging cruise (SBNMS, IFAW, Agoa, The Netherlands; SBNMS, *Summer 2012*).
- Humpback whale research planning & exchanges, SBNMS, D.R., Agoa, The Netherlands (*2011-2012*).
- *Humpback Whales of the Southeast Caribbean*, Peter Corkeron, Frederick Wenzel, Sofie van Parijs, PSB, NEFSC Collaborators: Dr. Per Palsbol, University of Groningen, Netherlands, Dr. Meike Scheidat, IMARES, Netherlands, Dr. Nathalie Ward, Stellwagen Bank National Marine Sanctuary, USA (*2017+*).
- *Studying Humpback Whales in Bequia, St. Vincent and the Grenadines*. SBNMS: N. Ward & NMFS: S. van Parijs (*2017+*).
- *TRANSCIENCE: TRANSCIENCE* (Caribbean Islands Marine Megafauna Conservation)—Yarari MMS, (Dutch) (Submitted joint proposal to \$600K; Planned 2017-2021).
- *CARI'MAM* (Caribbean Marine Mammals Preservation Network)—Agoa MMS, French Antilles (Submitted joint proposal 3-4 million Euro; Planned 2017-2021).

### PUBLICATIONS AND EXHIBITS COMPLETED

- D.R. Samana Humpback Whale Photo-ID Catalog for Whalewatch Naturalists (*2008*).
- D.R. Samana Whale Museum Outreach/Education Sister Sanctuary Exhibit (CEBSE) (*Samana, D.R. 2010*).
- D.R. Sister Sanctuary Youth Program (CEBSE) (*2010*).
- Cape Cod Museum of Natural History & D.R. Samana Whale Museum partnership (CEBSE and FUNDEMAR, 2011).
- SBNMS Sister Sanctuary Website (*2012*).
- SBNMS Sister Sanctuary Fact Sheets (21) (*2012+*).
- CARIB Tails' Website (*2014*).
- *A Stranding Guide to Marine Mammals of the Wider Caribbean Region* (UNEP, Ward 2013).
- *Our Humpback Whales: Protection Beyond Borders*; Joint publication between SBNMS and The Nature Conservancy (TNC-DR) for tourism development (*Ward 2014*).
- A Strategy for Advancing Humpback Whale Conservation and Transboundary Management (*SBNMS 2016*).
- Traveling Exhibit: ANIMALS without PASSPORTS Exhibit: Mystic Aquarium (*2013*), Boston Museum of Science (*2014*), Norwalk Aquarium (*2016*).

### INTERNATIONAL COMMITTEES, CONFERENCES and WORKING GROUPS PRESENTATIONS

- Marine Mammal Commission Annual Meeting in the Caribbean; Sister Sanctuary presentation (*Puerto Rico 2005*).

## NORTH ATLANTIC HUMPBACK WHALE SISTER SANCTUARY PROGRAM

- UNEP/SPAW Scientific and Technical Advisory Committee; Sister Sanctuary presentation (*Guadeloupe 2005*).
- AGOA Steering Committee Meeting (*Martinique 2008*).
- UNEP Intergovernmental Meeting: Marine Mammal Action Plan SubCommittee (*2008-present*).
- UNEP Intergovernmental Meeting: Marine Mammal Experts Group (*2009-present*).
- UNEP Intergovernmental Meeting: Species Criteria Listing SubCommittee (*2010-present*).
- ICMMPA (International Conferences on Marine Mammal Protected Areas) (*Hawaii 2009*) (*Martinique 2011*) (*Australia 2014*, not included).
- UNEP/SPAW Conference of Parties Meeting: Sister Sanctuary Program (*Jamaica 2010*).
- UNEP/SPAW Meetings: Marine Spatial Planning (*Miami 2011*) (*D.R. 2012*).
- International Whaling Commission (IWC): Entanglement Response Training Workshops; Spanish (*La Paz, Mexico, 2011*); French and English (*St. Martin 2013*).
- UNEP/IWC Meeting: Sister Sanctuary and SBNMS Marine Mammal Research (*Panama 2012*).
- European Cetacean Society Meeting: Presentation (*Malta 2015*).
- NAHW-SSP Parties Meeting: Marine Mammal Sanctuaries Cooperation (*St. Maarten 2012; 2015*).
- Society for Marine Mammalogy Biennial Meeting: Poster Presentation (*December 2016*).
- UNEP/SPAW Conference of Parties meeting: Conservation Status of Marine Mammals in WCR (*Jamaica 2012*).
- UNEP/SPAW Conference of Parties (COP) and Scientific and Technical Committee (STAC) (*Colombia, December 2014*) (Video Presentation).

## WORKSHOPS AND TRAINING

- Sister Sanctuary Program Overview (*2005-present*).
- Sister Sanctuary Action Plan Workshop (*Santo Domingo, D.R. 2007*)
- Lindos Sueños Youth Program Whale Watch Education Program (*Santo Domingo, D.R. 2007*).
- SSP Research and Education Action Plan between D.R. and SBNMS (*Santo Domingo, 2008*).
- Best Practices Whale Watching (*Santo Domingo, D.R. 2009*).
- Tourism Development Program (*Santo Domingo, D.R. 2010*).
- Museum Volunteer Program Training (*Samana, D.R. 2010*).
- Exchange Visits among Partner countries (*D.R. 2011, ongoing*).
- LifeWEB Grenadine Program (*Samana, D.R. 2011*).
- SMMRD Management Plan Development Process Workshops (*D.R. 2011, 2012*).
- Learning Exchanges on Marine Spatial Planning (*D.R. 2012*).
- LifeWEB Marine Spatial Planning (*Miami 2011; Panama 2013*)
- *Caribbean Netherlands SSP Workshop for Development of Research Plan* (*St. Maarten 2011*).
- Entanglement Response Training (*Mexico 2012; St. Martin 2013*).
- Ship Strike Mitigation Workshop (*Panama, 2014*).
- Acoustics Research Discussions with Sister Sanctuary Partners (*2013+*).
- *Sister Sanctuary Program Workshop* (*St. Maarten, 2015*)

## APPENDIX C JUMP WITH WHALES PROGRAM RESOURCES

**Jump with Whales** is a humpback whale conservation education campaign for the Wider Caribbean Region sponsored by NOAA's Stellwagen Bank National Marine Sanctuary, UNEP's Specially Protected Areas and Wildlife Programme and NAHW-SSP's international partners. The initiative is a multi-national and multi-organizational effort, with each partner contributing a valuable and productive component toward marine mammal conservation education in the Wider Caribbean Region.

As outlined in the Marine Mammal Action Plan for the Wider Caribbean Region and SPAW's Workplan 2013-2014 {2.4.2 (41) (h)}, *Jump with Whales'* marine mammal education and awareness-raising initiative includes the following capacity-building components for participating SPAW Parties and other interested Caribbean partners.

- CARIB Tails Citizen Science Project for Yachters (2014+):  
Website ([www.caribtails.org](http://www.caribtails.org))  
18 Fact Sheets  
Twelve Popular Articles (e.g., *Cruising World*, *Caribbean COMPASS*, *Yachting News*) (2013+).
- Allied Whale Research Grant for Caribbean Fluke Matching (2014+):  
Caribbean Humpback Fluke Catalogue with GoM and NAHWC
- Whale Muse Seeker (2016+)
- Name-A-Calf & Adopt a Humpback Family (2017-2018+):  
Pilot Project 2017—Saba and Dominican Republic  
United Nations Poster (10-25 islands in WCR)  
Salt's Sanctuary Activities Book and Kit Book (all languages)  
Jump with Whales Coloring Book (all languages)
- Animals without Passports Traveling Exhibit (2017-2018)
- UNEP-SPAW's Year of the Humpback Whale (2019-2020).

## APPENDIX D SISTER SANCTUARY FACT SHEETS

The following Fact Sheets can be accessed via the SBNMS website:

<http://stellwagen.noaa.gov/sister/welcome.html>

Or the CARIB Tails website:

[www.caribtails.org](http://www.caribtails.org)

### HUMPBACK WHALES:

- Humpback Whales, International Citizens (*SBNMS and CARIB Tails*)
- Identifying Humpback Whales (*SBNMS and CARIB Tails*)
- Humpback Whale Migration (*SBNMS and CARIB Tails*)
- Humpback Whale Behaviors on Breeding Grounds of WCR (*CARIB Tails*)
- Salt, The Matriarch of Stellwagen Bank (*CARIB Tails*)
- Humpback Hazards (*CARIB Tails*)\*
- Into the Wild—CARIB Tails & SSP Discoveries (*CARIB Tails*)\*

### SISTER SANCTUARIES:

- North Atlantic Humpback Whale Sister Sanctuary Program (SSP) (*SBNMS and CARIB Tails*)
- UNEP: Sister Sanctuary Framework (*SBNMS*)
- UNEP: Wider Caribbean Region (WCR) (*SBNMS*)
- Dominican Republic / SMMRD (*SBNMS*)
- Agoa Marine Mammal Sanctuary (*SBNMS*)
- Bermuda Marine Mammal Sanctuary (*SBNMS*)
- Yarari Marine Mammal Sanctuary/Caribbean Netherlands (*CARIB Tails*)

### CARIB TAILS INTERNATIONAL CITIZEN SCIENCE PROJECT FOR YACHTERS:

- CARIB Tails Project (*CARIB Tails*)
- Safe Boating Near Humpback Whales (*CARIB Tails*)
- Photographing Humpback Whales (*CARIB Tails*)
- Safe Passage for Humpbacks Video (*CARIB Tails*)\*

### JUMP WITH WHALES:

- Jump with Whales Coloring Book (all languages)\*
- Salty's Beat\*
- Fluke Matching\*

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\* Under development.

**APPENDIX E  
ACRONYMS**

ATEMAR	Fundacion Atemar Samana
CEP	Caribbean Environment Programme
DIREN	Départementale de l'Environnement, Guadeloupe, Martinique
ESA	Endangered Species Act, USA
EEZ	Exclusive Economic Zone
FUNDEMAR	Foundation for Marine Studies, Dominican Republic
ICMMPA	International Conferences on Marine Mammal Protected Areas
IMARES	Institute for Marine Resources and Ecosystem Studies, Dutch West Indies
IUCN	The World Conservation Union
IWC	International Whaling Commission
MaMPAN	Marine Mammal Protected Areas Network
MMAP	Marine Mammal Action Plan
MMS	Marine Mammal Sanctuary
MOA	Memorandum of Agreement
NAHWC	North Atlantic Humpback Whale Catalog
NAHW-SSP	North Atlantic Humpback Whale Sister Sanctuary Program
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
ONMS	Office of National Marine Sanctuaries
RAC	Regional Activity Center (Guadeloupe)
RCU	Regional Coordinating Unit (Kingstown, Jamaica)
SBNMS	Stellwagen Bank National Marine Sanctuary
SMMRD	Santuario de Mamíferos Marinos de la República Dominicana
SPAW	Specially Protected Areas and Wildlife
SS	Sister Sanctuary
SSP	Sister Sanctuary Program
TNC	The Nature Conservancy
UNEP	United Nations Environment Programme
WCR	Wider Caribbean Region

**APPENDIX F  
RESOURCES AND BIBLIOGRAPHY**

- Dolphins, Whales and Porpoises. 2001-2010 Conservation Action Plan for the World's Cetaceans.* IUCN/SSC Cetacean Specialist Group. IUCN, 2003.
- Dudley, N. and Rao, M. (2008). *Assessing and Creating Linkages Within and Beyond Protected Areas: A Quick Guide for Protected Area Practitioners.* In: Ervin, J. (ed.). Quick Guide Series. Arlington, VA: The Nature Conservancy.
- Hoyt, E. *Marine Protected Areas for Whales, Dolphins and Porpoises.* A World Handbook for Cetacean Habitat Conservation. Earthscan, London, 2005.
- Katona S.K. and Beard J.A. 1990. Population size, migrations and feeding aggregations of the humpback whale (*Megaptera novaeangliae*) in the western North Atlantic Ocean. *Rep. int. Whal. Commn* (special issue 12):295-305.
- Reeves, R.R., Swartz, S.L., Wetmore, S.E. and Clapham, P.J. 2001. Historical occurrence and distribution of humpback whales in the eastern and southern Caribbean Sea, based on data from American whaling logbooks. *J. Cetacean Res. Manage.* 3:37-59.
- Stevick, P., Bouveret, L., Gandilhon, N., Rinaldi, C., Rinaldi, R., Broms, F., Carlson, C., Kennedy, A., Ward, N., and Wenzel, F. *Humpback whales in the southeast Caribbean are behaviourally from those off the Dominican Republic.* Paper SC/63a/AWMP2 presented to the Scientific Committee of the International Whaling Commission, San Diego, California, USA. May 2015.
- UNEP SPAW. 2008. Action Plan for the Conservation of Marine Mammals in the Wider Caribbean Region. UNEP Document.
- UNEP 2014. LifeWeb-Spain UNEP-CEP Meeting on Scenarios for Transboundary Marine Mammal Management in the Wider Caribbean San Juan, Puerto Rico, 23 - 24 April 2014.
- Ward, N. and Moscrop, A. 1999. Marine mammals of the Wider Caribbean Region: a preliminary review of their conservation status. {UNEP (WATER)/CAR WG.22/INF.7}.
- Ward, N., Moscrop, A. and Carlson, C. 2001. Elements for the development of a marine mammal action plan for the Wider Caribbean: a review of marine mammal distribution. {UNEP(DEC)/CAR IG.20/INF.3}.
- Ward, N. 2005. Draft Action Plan for the Conservation of Marine Mammals in the Wider Caribbean Region, {UNEP(DEC)/CAR WG.27/2 Rev.3}.
- Ward, N. Report: Regional Workshop of Experts on the Development of the Marine Mammal Action Plan for the Wider Caribbean Region, 2005. {UNEP (DEC)/CAR WG. 27.3}.