Fondation pour la Protection de la Biodiversité Marine
FoProBiM
www.foprobim.org

Toward the Development of Haiti's System of Marine Protected Areas (MPAs)

An Ecosystem Services Assessment for the Creation of Haiti's System of MPAs

ReefFix

An Integrated Coastal Zone Management (ICZM) Ecosystem Services Valuation and Capacity Building Project for the Caribbean

Funded by:
The Governments of Mexico and Monaco
Organization of American States

August, 2013

Prepared by:
Jean Wiener

Table of Contents

Summary 3

1. INTRODUCTION 5

1.1 Background 5

1.2 ReefFix 12

1.3 Statement of Work 13

2. THE SITUATION IN HAITI 13

3. METHODOLGY 14

Interpretation of Data 16

4. SITE DATA 17

4.1. Proposed Parc Marin des Trois Baies (Northeast) 17

4.1.a. Proposed Parc Marin des Trois Baies (Caracol) 18

4.1.b. Proposed Parc Marin des Trois Baies (Ft. Liberté/Lagon aux Bœufs) 19

4.2. Proposed Parc Marin de la Baie de l'Acul 20

4.3. Proposed Parc Marin Gonaïves/Grande Saline 21

4.4. Proposed Parc Marin des Arcadins 22

4.5. Proposed Parc Marin la Gonâve-Nord 23

4.6. Proposed Parc Marin la Gonâve-Sud 24

4.7. Proposed Parc Marin des Rochelois 25

4.8. Proposed Parc Marin Baradères/Cayemites 26

4.9. Declared Parc Marin Ile-à-Vaches/Aquin 27

V. TARGETS FOR THE GRANADA DECLARATION (Caribbean Challenge) 28

VI. ANNEXES 28

Annex I. Ranking of Sites 28

Annex I.a. Total value of mangrove ecosystem services 28

Annex 1.b. Total value of coral reef ecosystem services 28

Annex 1.c. Total recommended MPA site sizes 29

Annex 1.d. Total value of ecosystem services by site (mangroves and coral reefs): 29

Annex II. Ecosystem Service Values by Cover Type for Marine Parks and Environs in the Caribbean (US$) 30

Annex III. Resources, Endangered Species, and Status of Proposed MPA Sites 31

Annex IV. Primary Characteristics and Threats to Proposed MPA Sites 32

Annex V. Draft Presidential Decree for the Creation of a Marine Protected Area 33

Summary

Ecosystem services are the benefits people obtain either directly or indirectly from ecological systems (Millennium Ecosystem Assessment, 2003, page v.) and include fisheries production, shoreline stabilization, carbon sequestration, storm protection, nutrient cycling, tourism value, and medicinal products values among many others. The replacement costs of these systems are also often included. The process of identifying and quantifying ecosystem services is increasingly recognized as a valuable tool for the efficient allocation of environmental resources (Heal et al., 2005; Millennium Ecosystem Assessment, 2003). By estimating and accounting for the economic value of ecosystem services, social costs or benefits that otherwise would remain hidden can potentially be revealed and vital information that might otherwise remain outside of the economic decision making calculus at local, national, and international scales can be internalized (Millennium Ecosystem Assessment, 2005).

However, achieving such an objective requires considerably better understanding of ecosystem services and the landscapes that provide them. Thanks to the increased ease of using Geographic Information Systems (GIS) and the public availability of high quality land cover data sets (in this case through Google Maps), bio-geographic entities such as forests, wetlands and beaches can now more easily be attributed with the ecosystem services they deliver on the ground.

This ReefFix project, supported by the governments of Mexico and Monaco through the Organization of American States (OAS), is an Integrated Coastal Zone Management (ICZM) Coral Reef and Mangrove Restoration and Watershed Management Demonstration program that works with Small Island Developing States (SIDS) to restore and effectively manage coastal resources through the use and development of cost-effective techniques and economic validation of ecosystems (OAS/Department of Sustainable Development). This report is a continuation, expansion, and re-assessment of coastal and marine ecosystem services values for Haiti from an initial study undertaken by FoProBiM for ReefFix in the Caracol bay area in 2009 (funded by the government of Chile).

Several areas of Haiti have been identified as areas of interest for the development of Coastal and Marine Protected Areas. This study is based on the examination of the locations for Haiti's first network of Marine Protected Areas (MPAs) first proposed by the *Fondation pour la Protection de la Biodiversité Marine* (FoProBiM, 2000) and includes the sites of: Caracol/Ft. Liberté/Lagons aux Bœufs (Trois Baies), Baie de l'Acul, Gonaïves/Grand Saline, Arcadins, La Gonâve Nord, La Gonâve Sud, Banc des Rochelois, Baradères/Cayemites, and Ile-à-Vaches/Aquin. On August 7, 2013, just prior to the release of this report, the Haitian government through a decision of its Council of Ministers designated an expanded delimitation of the Ile-à-Vaches site in this study as a mixed marine/terrestrial protected area.

The evaluation of the condition of the various ecosystems needs to be taken into consideration in terms of ranking procedure (see Methodology/Interpretation of Data). In terms of ranking for mangrove linked ecosystem services, the Caracol area (good condition) with 5,260 ha provides an estimated US$ 3,156,000,000/yr. of services with Gonaïves/Grande Saline (poor condition) in second place at 8,162 ha and an estimated mangrove ecosystem value of US$ 1,632,000,000/yr. Ranking of coral reef linked ecosystem services placed the Banc des Rochelois (good condition) first with 5,720 ha and US$ 343,200,000/yr. estimated coral reef linked ecosystem services and Ile-à-

Vaches/Aquin (good condition) with 5,520 ha providing and estimated US$ 331,200,000/yr. of ecosystem services. For combined mangrove and coral reef estimates, Caracol placed first with mangroves in good condition and coral reefs in excellent condition with an estimated value of ecosystem services of US$ 3,246,000,000 and Gonaives/Grande Saline second at US$ 1,623,680,000. The total amount of ecosystem services provided by coral reefs and mangroves within all nine of these proposed marine protected area sites is over US$ 9,500,000,000/yr. not including services provide by seagrass systems (which were not evaluated for this study and the addition of which would exponentially increase the total value of all three linked ecosystems: mangroves, seagrasses, and coral reefs).

With all data analyzed, the Caracol Bay area should be considered as the most important site in Haiti in terms of the need for protection and the development of a sustainable management plan.

With claimed Territorial Seas of approximately 30,000 km^2 the development of the suggested sites within this study, taking into consideration ecosystem resilience and connectivity, would place an estimated 23% of Haiti's coastal and marine zones under protection; thus potentially surpassing the targets recommended by the Granada Declaration (Caribbean Challenge).

1. INTRODUCTION

1.1 Background

The preparations for the **United Nations Conference on Sustainable Development RIO+20** identified the oceans and marine ecosystems as one of seven areas[1] which need priority attention to ensure global sustainability. The very first entry point to discuss ocean governance was a side event of the forum on science, technology and innovation for sustainable development held on June 12, 2012, focusing on science and governance for global sustainability. The panelists and the public called for more and new research, including in economic valuation techniques, to fully understand and evaluate the impacts on marine ecosystems such as coral reefs and mangrove ecosystems.

Noting that current governance remains fragmented along both sectoral and geographical lines that ignore the interconnectivity and scale of ocean issues, they recognized that there is an urgent need for an international framework of cooperation for both ocean research and governance, which will define the conditions for scientist to prepare accurate scenarios for the future. The **Rio Ocean Declaration[2]** called for strong and immediate action to meet the sustainable development goals for oceans, coasts, and **Small Island Developing States (SIDS)** at Rio+20 and beyond. Of the three primary goals one of them is to enhance the capability of SIDS and developing coastal countries to benefit from, and sustainably manage, their marine resources and to adapt to climate change through increased financing, technology transfer, commensurate with the needs and challenges facing developing countries and SIDS, and ocean use agreements to ensure that the benefits derived from the sustainable use of resources in the Exclusive Economic Zones (EEZs) of SIDS and developing coastal countries accrue to them.

The Caribbean contains some of the world's richest marine biodiversity. In open waters and along coastlines, the region harbors 10% of the world's coral reefs, 1,400 species of fish and marine mammals, and tens of thousands of hectares of mangrove forests.

With 70% of the population living along the coast, Caribbean lives and livelihoods directly depend upon healthy marine and coastal resources. Alarmingly, the Caribbean is increasingly threatened by development, pollution, overfishing and climate change.

To the extent that the 37 Caribbean nations and overseas territories are separated by water, they are united by the Caribbean Sea. Governments and people throughout the Caribbean must work together to address growing threats to the sea and its resources. The Caribbean Challenge Initiative (CCI) is the first conservation initiative embraced by governments across the region.

[1] United Nations Conference on Sustainable Development "7 Critical Issues at Rio+20" available at http://www.uncsd2012.org/7issues.html

[2] The Rio Ocean Declaration is available at http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/pdf_Rio_Ocean_Declaration_2012.pdf

Launched in 2008, the CCI is an endeavor of unprecedented scale and scope. Ten participating CCI countries and territories have committed to:

- conserving at least 20% of their nearshore marine and coastal environments in national marine protected areas systems by 2020; and,

- creating National Conservation Trust Funds, endowed by new sustainable finance mechanisms (such as tourism fees), dedicated to solely to funding park management.

In May 2013, in a joint effort to safeguard and bolster the Caribbean region's tourism-dependent economy, fifteen Caribbean governments and seventeen corporations met on Necker Island, home of Sir Richard Branson, in the British Virgin Islands and made a series of bold commitments to preserve and protect the region's marine and coastal environment, and accelerate efforts to transition to renewable energy.

These commitments included approximately $64 million in funding to support marine and coastal conservation, along with commitments to take new actions and to put in place more sustainable business practices. The high-level dialogue resulted in consensus on the utmost importance of working together – as a region and across sectors – to tackle the pressing and interlinked issues of marine and coastal conservation, renewable energy and economic development. The specific areas for further work include:

- The urgent need to create protection for sharks and rays across the whole Caribbean region with the aim of creating a region-wide sanctuary within two years.

- Establishing a clear regulatory framework that delivers a systemic and regional approach to conservation of the marine and coastal environment, including increasing considerably the number of marine protected areas.

- A dramatic acceleration in the transition from fossil fuels to alternative energy sources over the next five years. This will be supported by the sharing of best practices, scaling of new technologies, and streamlining of regulatory processes applicable to renewable energy.

"Protecting and harnessing the natural world is the greatest opportunity of our lifetimes," said Sir Richard Branson, founder of the Virgin Group. "The energy challenge and marine conservation challenge in the Caribbean go hand-in-hand: we can't have a healthy economy without a healthy environment, nor a healthy environment without a healthy economy."

"The Caribbean is truly a paradise under threat, and today's focus is a critical step toward a brighter future. Governments and their people, companies and their consumers, and local communities all must work together to protect this beautiful region," said Glenn Prickett,

Chief External Affairs Officer for The Nature Conservancy. "This event has demonstrated that no longer is protecting nature viewed as a luxury, it is critical to the success of the region's economy."

Commitments announced at the Summit by individual governments to support these efforts included:

- The Bahamas: Establishment of a national trust fund to protect biodiversity, and recent declaration of six marine protected areas, with a pledge by the Government to further expand the system of marine reserves.

- The British Virgin Islands: Adoption of a Protected Areas System Plan which calls for 33 percent of the marine and coastal environment to be protected.

- Jamaica: Establishment of a network of 14 fish sanctuaries.

- Puerto Rico: A commitment to double the number of protected areas.

- Grenada: Reaffirmation of a previous commitment to protect 25 percent of Grenada's marine and coastal environment.

- Belize: Protection of 30 percent of Belize's marine and coastal environment, with over 10 percent designated as no-take fishing zones.

Coral reefs are sometimes referred to as "canaries of the sea" because of their early warning ability to forecast near-shore oceanic stress. Because of their biological diversity, they are also called "rainforests of the sea". Coral reefs are vital to the well-being of millions of people. Tropical marine and coral reef ecosystems, including mangroves and sea grasses, are vulnerable environmental resources that provide significant economic goods and services. The health of these resources is critical to human well-being. By accounting for coastal marine and coral reef ecosystem economic values in management decisions, Small Island Developing States (SIDS) can sustain their flow of goods and services in the interest of current and future generations.

Compared to just a few decades ago, the ever-increasing number and strength of forces affecting coastal ecosystems, including mangroves, require coastal managers to respond and adapt to ensure the sustainability of valued ecosystem services and products. One of the major challenges in the Caribbean region is strengthening the resilience of coastal ecosystems to the climate change-induced sea level rise and temperature increases

The Ocean covers 70% of the surface of the planet, yet we are only beginning to understand the extent and depth of the services it provides to us daily in terms of economic and ecological benefits. The more fundamental role of the ocean in absorbing nutrients, cycling carbon, regulating climate, harboring biodiversity and providing basic life support to planet

Earth remains to be quantified. Coastal and marine ecosystems protect lives and livelihoods, provide people with services for their livelihoods, nutrition and environmental security, as well as help defray the costs to society from the loss of ocean services related to pollution absorption, changes in ocean productivity, carbon sequestration, and climate regulation as a result of rapidly increasing atmospheric CO_2 concentrations and more local human pressures.

Along with this:

- Fish products are vital for food security and human wellbeing, supplying over 4.2 billion people with at least 15 per cent of their average animal protein intake
- In 2009, fisheries supported the livelihoods of about 540 million people (8 per cent of the world population)
- Approximately 30 per cent of the world's fish stocks are overexploited, depleted, or recovering from depletion and 50 per cent are fully exploited
- Globally, sea levels have been rising at an average rate of about 2.5 mm per year between 1992 and 2011
- Increasing carbon dioxide levels in the air are altering the chemistry of the ocean's surface causing it to become more acidic. The ocean's pH declined from 8.11 in 1992 to 8.06 in 2007, posing threats to marine food webs and ecosystems
- If ocean acidification trends continue, 75 percent of all coral reefs will face high to critical threat levels by mid-century
- International shipping transports around 90 per cent of world commerce and is the safest, most secure, most efficient and most environmentally sound means of bulk transportation
- Marine-based renewable energy (wind, wave and tidal) potential is high, yet in 2008 these energy technologies represented just 1 per cent of all renewable energy production
- The tourism economy, including coastal tourism, represents 5 percent of global GDP and contributes 6 to 7 per cent of total employment. Estimates show global spending on ecotourism is increasing by about six times the industry-wide rate of growth
- The amount of nitrogen reaching oceans and coasts has increased three-fold from pre-industrial levels - primarily due to agricultural run-off and untreated sewage. This can degrade marine ecosystems and groundwater and lead to the formation of oxygen-poor 'dead' zones.

Caribbean Countries have requested technical assistance to achieve the commitments laid out in the World Summit on Sustainable Development (WSSD) Plan of Implementation

and the Convention on Biological Diversity targets. A critical component of this technical assistance is the availability of appropriate and adequate data with which to establish robust baselines and monitor progress towards the goals.

The Millennium Development Goals Report 2012 indicated that in 2010, protected areas covered 12.7 per cent of the world's land area, but such protection extended to only 1.6% cent of the total ocean area. Since 1990, protected areas have increased in number by 58% and in their extent by 48%. But growth has varied widely across countries and territories. Terrestrial protection doubled between 1990 and 2010 in 59 of 228 countries with available data, and marine protection doubled in 86 of 172 countries with available data. In contrast, growth of less than 1 per cent, or no growth at all, occurred in the terrestrial protected area system of 54 countries, and in the marine protected area system of 35 countries. Despite their relatively small extent, marine protected areas have expanded at a faster pace than those on land. The extent of protection increased especially in coastal waters out to 12 nautical miles—from 3.1 per cent in 1990 to 7.2 per cent in 2010[3].

According to the Millennium Ecosystem Assessment[4], ecosystem services are the benefits people obtain either directly or indirectly from ecological systems. Quantifying ecosystem services is a valuable tool for countering private attempts to convert an ecosystem such as a mangrove swamp to a marina, golf, and hotel development. By estimating and accounting for the economic value of ecosystem services, social costs or benefits that otherwise would remain hidden can potentially be revealed and vital information that might otherwise remain outside of the economic decision making calculus at local, national, and international scales can be internalized (Millennium Ecosystem Assessment, 2005).

The most important sites for species conservation remain unprotected. Conservation action is slowing the rate at which species are moving towards extinction. New research has confirmed that appropriately located protected areas can reduce declines in status of species. But despite an increase in these areas, half of the world's most important terrestrial sites for species conservation remain unprotected. There are, for example, 588 Alliance for Zero Extinction sites (AZEs), supporting the only remaining population of one or more highly threatened species. Fifty-one per cent of these critical sites are wholly unprotected, as are 49 % of the 10,993 Important Bird Areas (IBAs). Only 22 per cent of AZEs and 28 percent of IBAs are completely covered by protected areas.

Protected-area coverage of these important sites has increased over time. But in terms of proportion, the extent of protected area covering key biodiversity sites as a share of overall conservation land preserves has declined annually since 1950. Adequate protection and management of AZEs and IBAs, among other important sites, is called for to forestall extinctions, safeguard ecosystem services, preserve the benefits that people derive from

[3] United Nations. The Millennium Development Goals Report 2012 Goal 7: Ensure Environmental Sustainability Pg. 49

[4] Millennium Ecosystem Assessment, 2003. Ecosystems and Human Well-Being: A Framework for Assessment. Island Press, Washington, DC

these sites, and support international commitments under the Convention on Biological Diversity.

In addition, since 2009 IUCN – the International Union for the Conservation of Nature, has initiated recommendations for the development of a tool to grow a Red List of Ecosystems. It will be a global standard for how we assess the status of ecosystems, applicable at local, national, regional and global levels and will complement the IUCN Red List of Threatened Species which is the world's most comprehensive inventory of the global conservation status of biological species.

The RLE will be used to provide the following:

- **Conservation**: to help prioritize action, for example, in terms of ecosystem restoration and land use practices, and as a means to reward good and improved ecosystem management.
- **Land use planning**: to highlight the risks faced by ecosystems and ecosystem services as important components of land use planning, for example, clean water, maintenance of soil fertility, pollination, and natural products.
- **Improvement of governance and livelihoods**: to link ecosystems services and livelihoods, and explore how appropriate governance methods can improve ecosystem management and livelihood security.
- **Macro-economic planning**: to provide a globally-accepted standard that will enable planners to evaluate the risk and related economic costs of losing ecosystem services, and, conversely, the potential economic benefits of improved management.

There have also been several key findings from the World Resource Institute's Reefs at Risk in the Caribbean Report (Lauretta Burke, Jon Maidens et al., September, 2004) which include:

- **Nearly two-thirds of coral reefs in the Caribbean are threatened by human activities.** Integrating threat levels from all sources considered in this analysis (coastal development, watershed-based sediment and pollution, marine based threats, and overfishing), the Reefs at Risk Threat Index identified about one-tenth of Caribbean coral reefs at very high levels of threat, one-third at high threat, one fifth at medium threat, and one-third at low threat.
- **An estimated one-third of Caribbean coral reefs are threatened by coastal development.** This includes sewage discharge, urban runoff, construction, and tourist development.
- **Sediment and pollution from inland sources threaten about one-third of Caribbean coral reefs.** Analysis of more than 3,000 watersheds across the region identified 20 percent of coral reefs at high threat and about 15 percent at medium

threat from damage caused by increased sediment and pollution from agricultural lands and other land modification.

- **Marine-based threats to coral reefs are widespread across the Caribbean.** Our indicator of marine-based damage and pollution identified about 15 percent of Caribbean reefs as threatened by discharge of wastewater from cruise ships, tankers and yachts, leaks or spills from oil infrastructure, and damage from ship groundings and anchors.
- **Overfishing threatens over 60 percent of Caribbean coral reefs.** Fishing above sustainable levels affects coral reefs by altering the ecological balance of the reef. The removal of herbivorous fish, which consume algae, facilitates algal overgrowth of corals. Declines in coral cover and increases in algal cover have been observed across the region. This analysis identified about one-third of Caribbean reefs at high threat from overfishing pressure and about 30 percent at medium threat.
- **Diseases and rising sea temperatures threaten to damage coral reefs across the Caribbean region.** Diseases have caused profound changes in Caribbean coral reefs in the past 30 years, with very few areas unscathed by disease, even reefs far removed from human influence. In addition, coral bleaching episodes-the most direct evidence of stress from global climate change on Caribbean marine biodiversity-are on the rise.
- **Ineffective management of protected areas further threatens Caribbean coral reefs.** With the growth of tourism, fisheries, and other development in coral reef areas, marine protected areas (MPAs) are an important tool for safeguarding coral reefs. At present, over 285 MPAs have been declared across the Caribbean, but the level of protection afforded by MPAs varies considerably. The Reefs at Risk Project found only 6 percent of MPAs to be rated as effectively managed and 13 percent as having partially effective management.
- **The coastal communities and national economies of the Caribbean region are poised to sustain substantial economic losses if current trends in coral reef degradation continue.** Coral reefs provide valuable goods and services to support local and national economies, and degradation of coral reefs can lead to significant economic losses, particularly in the coastal areas of developing countries, through loss of fishing livelihoods, malnutrition due to lack of protein, loss of tourism revenues, and increased coastal erosion. Analyses carried out by the Reefs at Risk project indicate that Caribbean coral reefs provide goods and services with an annual net economic value in 2000 estimated at between US$3.1 billion and US$4.6 billion from fisheries, dive tourism, and shoreline protection services.

1.2 ReefFix

Ecosystem services are the benefits people obtain either directly or indirectly from ecological systems (Millennium Ecosystem Assessment, 2003, page v.) and include fisheries production, shoreline stabilization, carbon sequestration, storm protection, nutrient cycling, tourism value, and medicinal products values among many others. The replacement costs of these systems are also often included. The process of identifying and quantifying ecosystem services is increasingly recognized as a valuable tool for the efficient allocation of environmental resources (Heal et al., 2005; Millennium Ecosystem Assessment, 2003). By estimating and accounting for the economic value of ecosystem services, social costs or benefits that otherwise would remain hidden can potentially be revealed and vital information that might otherwise remain outside of the economic decision making calculus at local, national, and international scales can be internalized.

However, achieving such an objective requires considerably better understanding of ecosystem services and the landscapes that provide them. Through the ReefFix project four case studies including a framework for the spatial analysis of ecosystem service values (ESVs) will be illustrated. Thanks to the increased ease of using Geographic Information Systems (GIS) and the public availability of high quality land cover data sets (in this case through Google Maps), bio-geographic entities such as forests, wetlands and beaches can now more easily be attributed with the ecosystem services they deliver on the ground.

This ReefFix project, supported by the governments of Mexico and Monaco through the OAS, is an Integrated Coastal Zone Management (ICZM) Coral Reef and Mangrove Restoration and Watershed Management Demonstration program that works with Small Island Developing States (SIDS) to restore and effectively manage coastal resources through the use and development of cost-effective techniques and economic validation of ecosystems (OAS/DSD).

ReefFix works with SIDS to complete stakeholder analysis and socio-economic valuation with a view towards improving oversight of marine resources to meet commitments made by SIDS to increase coverage and effective management. It has multi-level linkages that trains participating countries in (i) ecosystem goods and services valuation methodologies (ii) cost effective interventions to improve marine ecosystem health, and (iii) revenue raising techniques of cost recovery and user pays/polluter pays principles. In this process, ReefFix will use and develop cost-effective techniques that can be replicated throughout the wider Caribbean by applying the ReefFix methodology in up to seven case study sites that will include capacity building exercises and a workshop to disseminate preliminary results as well as lessons learned and best practices.

In this context, ReefFix offers a valuable opportunity for SIDS to strengthen their coastal zone management through one or more of the five options below:

1. Apply, when possible, three ecosystem services valuation methodologies on fisheries and/or tourism and/or estimated economic productivity/ha/year

2. Cost effective analysis of most efficient interventions such as sewage treatment vs. watershed management, reforestation or solid waste management
3. Green tax: Cost recovery mechanisms such as hotel bed tax or tourism tax ($1% tax to protect reasons that tourists come.)
4. Policy and legislation necessary for the implementation of a payments for ecosystem services project
5. System Plan of most representative marine ecosystems to meet Grenada Declaration to put 25 percent of near-shore marine and 25 percent of terrestrial natural resources under effective conservation by 2020 under the Grenada Declaration (Caribbean Challenge)

1.3 Statement of Work

Due to the lack of available information relating to options 2, 3, and 4 including socio-economic conditions, most types of tourism activities or revenue as well as a total lack of reliable information in regard to fisheries activities which would be required to accomplish the socio-economic portion of this study at the nine target sites, this study will address Options 1 and 5 above.

2. THE SITUATION IN HAITI

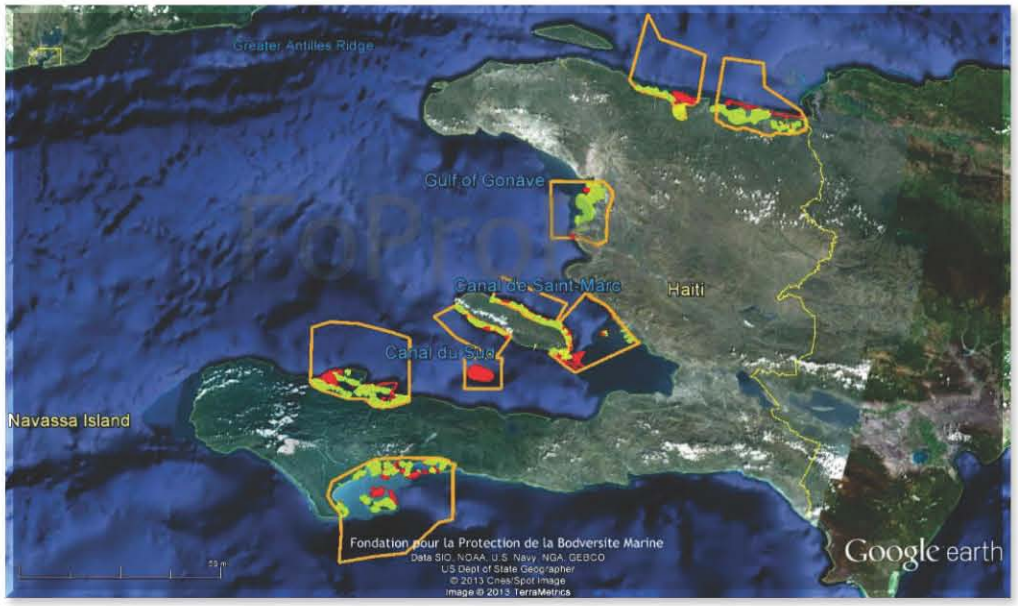
With over 1,770km of coastline, an island shelf estimated at approximately 5,000km^2 and territorial seas of close to 30,000km^2 (National Survey of Coastal and Marine Zones, FoProBiM 2013), Haiti is the third largest nation in the insular Caribbean with a population approaching 10 million. On August 7th, 2013 the Haitian government designated what may be considered the nation's first mixed use (coastal/marine/terrestrial) protected area as recommended in this report in the southwest (Ile-à-Vaches/Aquin) of the county although the specifics of how this area will be managed remains unclear.

Although coastal and marine resources in Haiti are critical to the nation's survival (e.g. maritime shipping, food security) and are present in many aspects of daily life (e.g. a view across the ocean from a road, a lunch made with "*tri-tri*", turtle shells at a souvenir stand, mangroves along coastal roads), they have suffered from a lack management and understanding of their critical role.

The Tragedy of the Commons is on full display in the exploitation and the attempts to manage these resources. Open access by everyone and anyone without any type of control is the primary reason for the extreme degradation of these important resources. With a dire economic situation, the concept of "I can't stop him from making a living and feeding his family" have become so ingrained that the downward spiral of fisheries exploitation has led to facetious comments in some parts of the country that "…they are now fishing with

bed sheets," a reference to the tiny net mesh sizes which are now being used in many parts of the country.

This document is meant to take an initial view at the evaluation of the monetary value of ecosystem services within areas proposed for the creation of a network of Marine Protected Areas (MPAs) for Haiti. It is designed to be a living document with changes/updates occurring as necessary as Haiti moves to create MPAs and a linked MPA network taking into account connectivity and resilience among the various sites.



Map of sites proposed for the creation of MPAs in Haiti (FoProBiM 2000)

3. METHODOLGY

The World Resource Institute's (WRI) economic valuation methodology provides a simple and replicable method for estimating the value of coral reefs and mangroves in the Caribbean. The methodology uses the concept of "ecosystem services" – the tangible benefits ecosystems provide which sustain and fulfill human life – as the basis for measurement. The approach looks primarily at the direct economic benefits provided by these resources; it does not attempt to calculate the Total Economic Value (TEV) of coral reefs and mangroves, which would include non-use values (for instance, the 'existence value' non-users place on the presence of the reef). The methodology focuses instead on three important ecosystem goods and services associated with coral reefs: fisheries, tourism, and shoreline protection services. These services comprise an integral part of many Caribbean economies. The methodology also offers guidance on estimating the wider (indirect) impact on the economy of these resources, the consumer surplus associated with their use, and the potential losses or gains in value associated with changes in ecosystem condition. (WRI, Economic Valuation of Coral Reefs, Methodology v2.1, October, 2007)

The Ecosystem Value Transfer (EVT)/Benefit Transfer Method (BTM) was used for this study in which values which have already been estimated for similar ecosystems are extrapolated to the study site. In an attempt to estimate the monetary value of the services that ecosystems provide various methods of ecosystem valuation have been designed. Dollar-based valuation systems can include: travel cost, productivity, benefit transfer, and others. Many individuals and institutions from around the world have developed estimates for the values of the wide range of ecosystem services which are provided as well as replacement values. These estimates range from hundreds to trillions of dollars. For this activity a median value of US$ 550,000 ($/ha/yr) rate for mangroves, and US$ 60,000 ($/ha/yr) rate for coral reefs is used based on a conservative mid-range average of a low/high of US$ 200,000/900,000 ($/ha/yr) for mangroves and US$ 20,000/100,000 ($/ha/yr) for coral reefs (Huber, R., OAS 2013).

Mangrove and coral reef ecosystem services in this evaluation were ranked against each other using the following table of ecosystem services vs. condition of the resources (values in US$).

Ecosystem Type ► Condition ▼	**Mangroves ($)**	**Coral Reef ($)**
Poor	200,000	20,000
Fair	400,000	40,000
Good	600,000	60,000
Excellent	900,000	100,000

(Huber, R., OAS, 2013)

Maps and tools (path and polygon) from Google Earth Pro where used to estimate the areal extent of ecosystems which were examined. Only areal measurements for mangroves and coral reefs are included. Only areas of linear/fringing mangroves greater than 10m deep (wide) were included. A complete areal assessment of Haiti's mangroves can be found on FoPoBiM's website.

No deep water corals or seagrass beds were included in this valuation due to the difficulty of determining the areal extent of these ecosystems. The addition of seagrass beds, deep sea corals and other types of substrate ecosystems would potentially exponentially increase the total monetary figure for total ecosystem services at each proposed MPA site; therefore, the figures provided in this study for total ecosystem services values should be considered extremely conservative.

The general condition of mangrove and coral reefs was estimated through a combination of on-the-ground/in-the-water observations, satellite imagery, location near large urban centers, location near watersheds (sedimentation and pollution), and aerial photography undertaken within the last 3 years. These ecosystems were given grades varying from (best to worst): excellent, good, fair, and poor and were ranked against each other.

Mangrove data was taken from recent work performed by FoProBiM during Haiti's first on-the-ground in-depth evaluation of the location and size of all of Haiti's mangroves in 2013.

A general evaluation of the condition of area seagrasses was estimated taking into consideration overall conditions of local mangroves and coral reefs, sedimentation from area watersheds, and coastal composition.

Interpretation of Data

Sizes of sites in relation to a standardized value for ecosystem services provided must also take into consideration the condition of the resources being examined (e.g. mangroves, coral reefs).

For example, although the Gonaives/Grand Saline mangrove site is entered as the #1 site in terms of size, ecosystem services provided by mangroves the condition of the site must also be taken into consideration. Although this site is technically the largest mangrove site in Haiti it is also highly degraded from man-made alterations to its primary fresh water source (the Artibonite River), the development of salt pans, and it is heavily logged for mangroves for fuel (raw wood and charcoal). Therefore, although it is a very large site, its ecosystem services have been highly degraded in comparison to a smaller site in better condition, for example, Caracol, which receives a higher grade for the condition of it resources and therefore value of its ecosystem services.

For coral reefs, size and condition must also again be factored into a final analysis. Coral reefs in (comparatively) excellent condition with dense growth, high rugosity and few threats (e.g. Caracol) would certainly provide more ecosystem service benefits than coral reefs in fair condition, sparse growth, low rugosity and many threats. The Arcadins area received a fairly high value based on overall size, however, much of what was included in the areal calculations included very large areas of sparse, patchy reefs providing limited coral reef based ecosystem services.

Other examples include the Baradères/Cayemites, and Ile-à-Vaches/Aquin sites which due to the difficulty in separating out coral reef and seagrass (and other substrate) ecosystems, coral reef measurements included coral reefs mixed with often very large areas of seagrasses or other substrate. This causes skewing of some of the valuation of the coral reef data in which areas of rich coral reef representation may appear to be less important in size comparisons due to the inclusion of this variable substrate in areas with large areas of more scattered patchy reefs. Another example of this is the comparison of the Baradères/Cayemites site with Caracol in which the Baradères/Cayemites site is comprised of large areas of scattered patchy reefs in fair condition mixed with seagrasses and other substrate (which would diminish its calculated coral reef ecosystem services value) whereas the reefs at Caracol are almost entirely coral reefs in excellent condition (which increases its ecosystem services value).

4. SITE DATA

4.1. Proposed Parc Marin des Trois Baies (Northeast)

Divided into two parts (below) for analysis (Caracol and Ft. Liberté/Lagon aux Boeufs).

4.1.a. Proposed Parc Marin des Trois Baies (Caracol)

Caracol

Ecosystem	Total Area	$/ha/yr rate	Total	Condition
Mangrove	**5,260 ha**	**$600,000**	**$ 3,156,000,000**	**Good**
Coral	**900 ha**	**$100,000**	**$ 90,000,000**	**Excellent**
Seagrass	**--**	**--**	**--**	**Excellent**
Total value of ecosystem services			**US$ 3,246,000,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**13,300 ha**			

Primary threats:

- Overfishing
- Fuel/Charcoal Production
- Coral harvesting
- Salt pan development
- Industrial Park
- Marine Pollution
- Sedimentation
- Coastal development
- Climate Change
- Invasives

4.1.b. Proposed Parc Marin des Trois Baies (Ft. Liberté/Lagon aux Bœufs)

Ft. Liberté/Lagons aux Bœufs

Ecosystem	Total Area	$/ha/yr rate	Total	Condition
Mangrove				
Ft. Liberté	**257 ha**	**$400,000**	**$ 102,800,000**	**Fair**
Lagons aux Bœufs	**42 ha**		**$ 1,680,000**	**Fair**
Coral				
Ft. Liberté	**203 ha**	**$40,000**	**$ 8,120,000**	**Fair**
Lagons aux Bœufs	**0 ha**		**$ 0**	**--**
Seagrass	**--**	**--**	**--**	**Fair**
Total value of ecosystem services			**US$ 112,600,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**96,780 ha**			

Total MPA site (Caracol/Ft. Liberté/Lagons aux Boeufs) = 13,300 + 83,480 = 96,780 ha

Primary threats:

- Overfishing
- Fuel/Charcoal Production
- Salt pan development
- Marine Pollution
- Sedimentation
- Coastal development
- Climate Change
- Invasives
- Development of a port facility

4.2. Proposed Parc Marin de la Baie de l'Acul

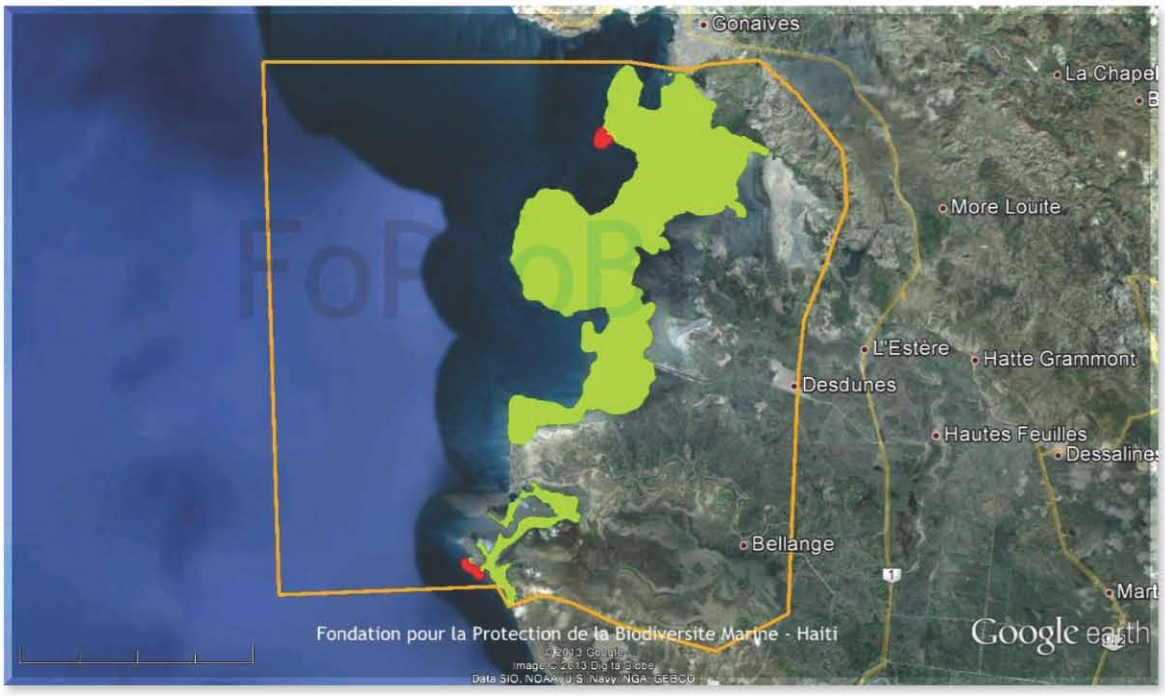
Baie de l'Acul

Ecosystem	Total Area	$/ha/yr rate	Total	Condition
Mangrove	**879 ha**	**$600,000**	**$ 527,400,000**	**Good**
Coral	**2,322 ha**	**$40,000**	**$ 92,880,000**	**Fair**
Seagrass	**--**	**--**	**--**	**Fair**
Total value of ecosystem services			**US$ 620,280,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**71,330 ha**			

Primary threats:

- Overfishing
- Fuel/Charcoal Production
- Coral harvesting
- Marine Pollution
- Sedimentation
- Coastal development
- Climate Change
- Invasives

4.3. Proposed Parc Marin Gonaïves/Grande Saline



Gonaïves/Grande Saline

Ecosystem	Total Area	$/ha/yr rate	Total	Conditions
Mangrove	**8,160 ha**	**$200,000**	**$ 1,632,000,000**	**Poor**
Coral	**34 ha**	**$20,000**	**$ 680,000**	**Poor**
Seagrass	**--**	**--**	**--**	**Poor**
Total value of ecosystem services			**US$ 1,632,680,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**86,068 ha**			

Primary threats:

- Overfishing
- Fuel/Charcoal Production
- Salt pan development
- Marine Pollution
- Sedimentation
- Coastal development
- Climate Change
- Invasives

4.4. Proposed Parc Marin des Arcadins

Arcadins

Ecosystem	Total Area	$/ha/yr rate	Total	Condition
Mangrove	**475 ha**	**$200,000**	**$ 95,000,000**	**Poor**
Coral	**4,700 ha**	**$60,000**	**$ 282,000,000**	**Good**
Seagrass	**--**	**--**	**--**	**Good**
Total value of ecosystem services			**US$ 377,000,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**78,600 ha**			

Primary threats:

- Overfishing
- Fuel/Charcoal Production
- Coral harvesting
- Marine Pollution
- Coastal Development
- Climate Change
- Invasives

4.5. Proposed Parc Marin la Gonâve-Nord

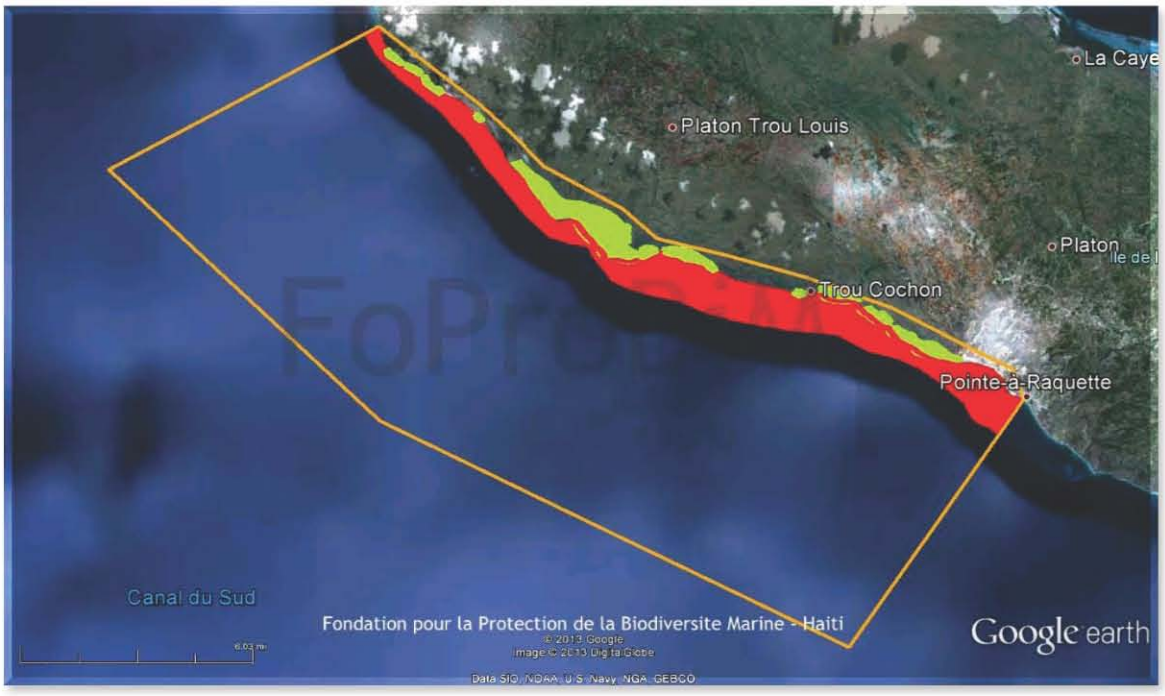
La Gonâve Nord

Ecosystem	Total Area	$/ha/yr rate	Total	Condition
Mangrove	**565 ha**	**$600,000**	**$ 339,000,000**	**Good**
Coral	**845 ha**	**$60,000**	**$ 50,700,000**	**Good**
Seagrass	**--**	**--**	**--**	**Good**
Total value of ecosystem services			**US$ 389,700,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**37,380 ha**			

Primary threats:

- Overfishing
- Fuel/Charcoal Production
- Coral harvesting
- Marine Pollution
- Climate Change
- Invasives

4.6. Proposed Parc Marin la Gonâve-Sud



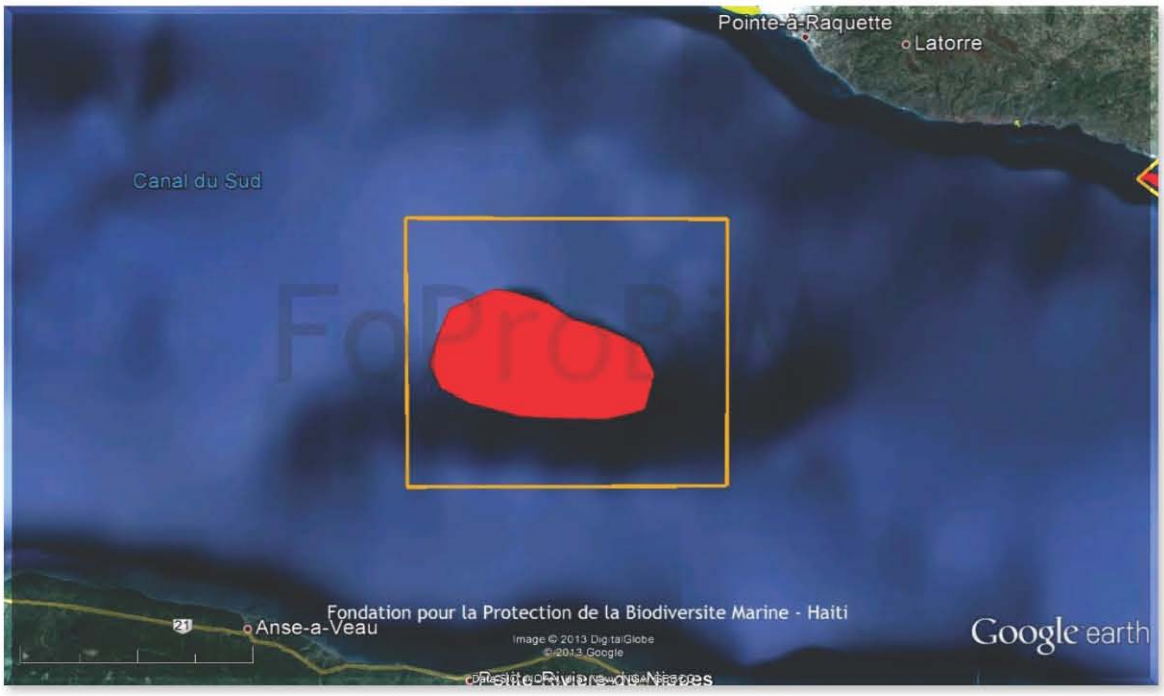
La Gonâve Sud

Ecosystem	Total Area	$/ha/yr rate	Total	Condition
Mangrove	**520 ha**	**$600,000**	**$ 312,000,000**	**Good**
Coral	**2,880 ha**	**$60,000**	**$ 172,800,000**	**Good**
Seagrass	**--**	**--**	**--**	**Good**
Total value of ecosystem services			**US$ 484,800,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**37,830 ha**			

Primary threats:

- Overfishing
- Fuel/Charcoal Production
- Coral harvesting
- Marine Pollution
- Climate Change
- Invasives

4.7. Proposed Parc Marin des Rochelois



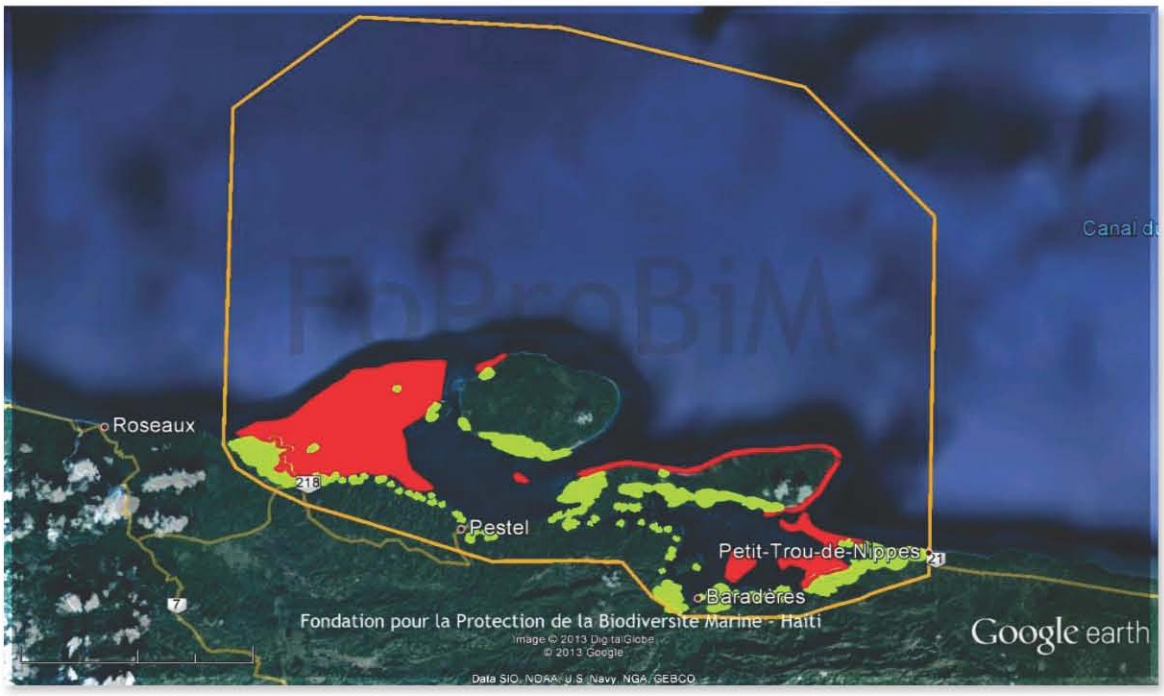
Rochelois

Ecosystem	Total Area	$/ha/yr rate	Total	Condition
Mangrove	**0 ha**	**--**	**$ 0**	**--**
Coral	**5,720 ha**	**$60,000**	**$ 343,200,000**	**Good**
Seagrass	**--**	**--**	**--**	**Good**
Total value of ecosystem services			**US$ 343,200,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**24,600 ha**			

Primary threats:

- Overfishing
- Climate Change
- Invasives

4.8. Proposed Parc Marin Baradères/Cayemites



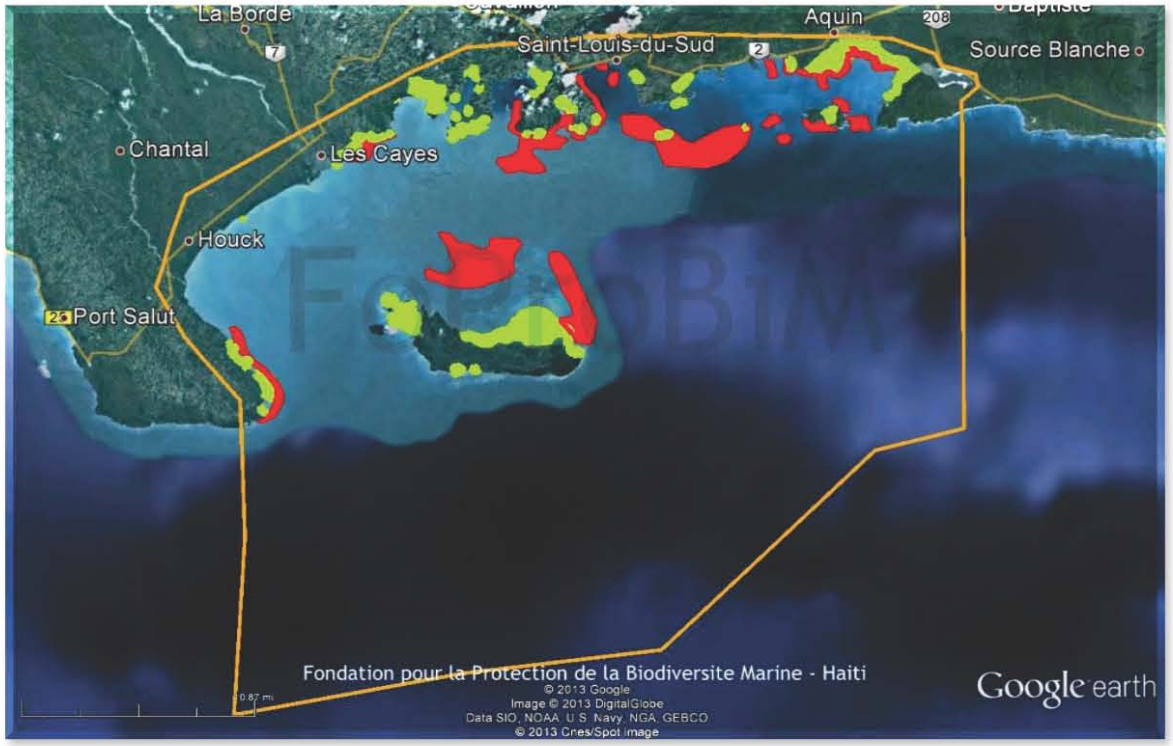
Baradères/Cayemites

Ecosystem	Total Area	$/ha/yr rate	Total	Condition
Mangrove	**2,050 ha**	**$400,000**	**$ 820,000,000**	**Fair**
Coral	**7,285 ha**	**$40,000**	**$ 291,400,000**	**Fair**
Seagrass	**--**	**--**	**--**	**Good**
Total value of ecosystem services			**US$ 1,111,400,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**152,300 ha**			

Primary threats:

- Overfishing
- Fuel/Charcoal Production
- Coral harvesting
- Climate Change
- Invasives

4.9. Declared Parc Marin Ile-à-Vaches/Aquin



Ile-à-Vaches/Aquin

Ecosystem	Total Area	$/ha/yr rate	Total	Conditions
Mangrove	**2,309 ha**	**$400,000**	**$ 923,600,000**	**Fair**
Coral	**5,520 ha**	**$60,000**	**$ 331,200,000**	**Good**
Seagrass	**--**	**--**	**--**	**Good**
Total value of ecosystem services			**US$ 1,254,800,000** (does not include seagrass beds)	
Total Recommended MPA Site (mangroves/coral reefs/seagrass)	**214,690 ha**			

Primary threats:

- Overfishing
- Fuel/Charcoal Production
- Coral harvesting
- Marine Pollution
- Sedimentation
- Coastal development
- Climate Change
- Invasives

V. TARGETS FOR THE GRANADA DECLARATION (Caribbean Challenge)

With claimed Territorial Seas of approximately 30,000 km^2 the development of all of the recommended Marine Protected Areas within this study, taking into consideration among other factors ecosystem resilience and connectivity, would place an estimated 7,150 km^2 or 23% of Haiti's coastal and marine zones under protection; thus potentially surpassing the targets recommended by the Granada Declaration (Caribbean Challenge).

VI. ANNEXES

Annex I. Ranking of Sites

Annex I.a. Total value of mangrove ecosystem services

	Site	Total Area (ha)	Condition	$/ha/yr rate	Total ($)
1	Caracol	5,260	Good	600,000	3,156,000,000
2	Gonaïves/Grande Saline	8,160	Poor	200,000	1,632,000,000
3	Ile-à-Vaches/Aquin	2,309	Fair	400,000	923,600,000
4	Baradères/Cayemites	2,050	Fair	400,000	820,000,000
5	Baie de l'Acul	879	Good	600,000	527,400,000
6	La Gonâve-Nord	565	Good	600,000	339,000,000
7	La Gonâve-Sud	520	Good	600,000	312,000,000
9	Ft. Liberté/Lagons aux Bœufs	299	Fair	400,000	104,480,000
8	Arcadins	475	Poor	200,000	95,000,000
10	Rochelois	0	--	--	--
	Total	**20,517**		**--**	**$ 7,909,480,000**

Annex 1.b. Total value of coral reef ecosystem services

	Site	Total Area (ha)	Condition	$/ha/yr rate	Total ($)
1	Rochelois	5,720	Good	60,000	343,200,000
2	Ile-à-Vaches/Aquin	5,520	Good	60,000	331,200,000
3	Baradères/Cayemites	7,285	Fair	40,000	291,400,000
4	Arcadins	4,700	Good	60,000	282,000,000
5	La Gonâve-Sud	2,880	Good	60,000	172,800,000
6	Baie de l'Acul	2,322	Fair	40,000	92,880,000
7	Caracol	900	Excellent	100,000	90,000,000
8	La Gonâve-Nord	845	Good	60,000	50,700,000
9	Ft. Liberté/Lagons aux Boeufs	203	Fair	40,000	8,120,000
10	Gonaives/Grande Saline	34	Poor	20,000	680,000
	Total	**30,409**	**--**	**--**	**$ 1,662,980,000**

Annex 1.c. Total recommended MPA site sizes

	Site	Total Area (ha)
1	Ile-à-Vaches/Aquin	214,690
2	Baradères/Cayemites	152,300
3	Caracol*	96,790*
4	Ft. Liberté/Lagons aux Bœufs*	96,790*
5	Gonaïves/Grande Saline	86,068
6	Arcadins	78,600
7	Baie de l'Acul	71,330
8	La Gonâve-Sud	37,830
9	La Gonâve-Nord	37,380
10	Rochelois	24,600
	Total	**799,588**

*Caracol, Ft. Liberté, Lagons aux Bœufs are combined into potentially one MPA.

Annex 1.d. Total value of ecosystem services by site (mangroves and coral reefs):

	Site	Total Area (ha)	Total ($)
1	Caracol	96,790*	3,246,000,000
2	Gonaïves/Grande Saline	86,068	1,632,680,000
3	Ile-à-Vaches/Aquin	214,690	1,254,800,000
4	Baradères/Cayemites	152,300	1,111,400,000
5	Baie de l'Acul	71,330	620,280,000
6	La Gonâve-Sud	37,830	484,800,000
7	La Gonâve-Nord	37,380	389,700,000
8	Arcadins	78,600	377,000,000
9	Rochelois	24,600	343,200,000
10	Ft. Liberté/Lagons aux Bœufs	96,790*	112,600,000
	Total		**$ 9,572,460,000**

*Part of the *Parc Marin des Trois Baies* MPA

Annex II. Ecosystem Service Values by Cover Type for Marine Parks and Environs in the Caribbean (US$)

Habitat Type	Ave.$/ha/yr	Lower Bound	Upper Bound
Beach	88,000	77,000	99,000
Beach near Dwelling	117,000	94,000	140,000
Coastal & Riparian Forest	9,271	5,542	13,000
Freshwater Stream	1,085	939	1,231
Freshwater Herbaceous Swamp	64,000	32,000	96,000
Grassland/pasture	118	118	118
Nearshore Aquatic Habitat	16,283	4,630	27,935
Coral Reef	60,000	20,000	100,000
Mangrove	550,000	200,000	900,000
Mangrove restoration	110,112	225	220,000

(Huber, R., OAS 2013)

Annex III. Resources, Endangered Species, and Status of Proposed MPA Sites

Resources ➤ Site ⮟	Mangroves	Coral Reefs	Seagrass	Mud Flats	Endangered Species*	Status
Caracol/Liberté	✓	✓	✓		Manatees Marine turtles Coral	Proposed
l'Acul	✓	✓	✓		Manatees Marine turtles Coral	Proposed
Gonaïves	✓			✓	Manatees Flamingos	Proposed
La Gonâve Nord	✓	✓	✓		Coral	Proposed
La Gonâve Sud	✓	✓	✓		Coral	Proposed
Arcadins	✓	✓	✓		Manatees Marine turtles Coral	Proposed
Rochelois		✓	✓		Coral Whales	Proposed
Cayemites	✓	✓	✓		Manatees Marine turtles Coral	Proposed
Ile-à-Vaches	✓	✓	✓		Manatees Marine turtles Coral	Declared

(FoProBiM 2000)

*Marine turtle nesting beaches or potential nesting beaches
Confirmed or potential location of *Acropora spp.*

Annex IV. Primary Characteristics and Threats to Proposed MPA Sites

Threats to ➤ Site ⮟	Mangroves	Coral Reefs	Seagrass	Mud Flats	Threats
Caracol/Liberté	✓	✓	✓		Overfishing[1], Fuel/Charcoal Production, Coral harvesting, Salt pan development, Industrial Park[2], Marine Pollution, Sedimentation, Coastal development, Climate Change, Invasives[3], Port facility[4]
l'Acul	✓	✓	✓		Overfishing[1], Fuel/Charcoal Production, Coral harvesting, Marine Pollution, Sedimentation, Coastal development, Climate Change, Invasives[3]
Gonaïves/Grande Saline	✓			✓	Overfishing[1], Fuel/Charcoal Production, Salt pan development, Marine Pollution, Sedimentation, Coastal development, Climate Change, Invasives[3]
La Gonâve Nord	✓	✓	✓		Overfishing[1], Fuel/Charcoal Production, Coral harvesting, Marine Pollution, Climate Change, Invasives[3]
La Gonâve Sud	✓	✓	✓		Overfishing[1], Fuel/Charcoal Production, Coral harvesting, Marine Pollution, Climate Change, Invasives[3]
Arcadins	✓	✓	✓		Overfishing[1], Fuel/Charcoal Production, Coral harvesting, Marine Pollution, Sedimentation, Coastal development, Climate Change, Invasives[3]
Rochelois		✓	✓		Overfishing[1], Climate Change, Invasives[3]
Baraderes/Cayemites	✓	✓	✓		Overfishing[1], Fuel/Charcoal Production, Coral harvesting, Climate Change, Invasives[3]
Ile-à-Vaches	✓	✓	✓		Overfishing[1], Fuel/Charcoal Production, Coral harvesting, Marine Pollution, Sedimentation, Coastal development, Climate Change, Invasives[3]

(FoProBiM 2000)

[1] Overfishing: including lobster, conch, sea turtles, and sea cucumbers
[2] Industrial Park: development of the Parc Industriel de Caracol (increased potential for marine and terrestrial pollution, increased exploitation of resources including mangroves)
[3] Invasives; particularly the Pacific Lionfish
[4] Port Facility; development of port facility in the Ft. Liberté area

Annex V. Draft Presidential Decree for the Creation of a Marine Protected Area

Draft Presidental Decree (Arrêté) for the creation of the « Parc Marin XXXXX »

Vu les Articles 36, 36-1, 36-5, 52-1.h, 136, 138, 215, 253, 254, et 256 de la Constitution ;

Vu la Loi du 6 juin 1963 établissant les règles spéciales relatives à l'habitation et à l'aménagement des villes et des campagnes en vue de développer l'urbanisme ;

Vu le décret du 18 mars 1968 dénommant "Parcs Nationaux ou Sites Naturels " toutes étendues de terres boisées ou pas sur lesquelles sont établis des monuments historiques ou sites naturels" ;

Vu le décret du 27 Octobre 1978 sur la pêche ;

et toute autre loi, arrêté, ou décret qui pourrait être applicable ;

Considérant que l'Etat Haïtien exerce sa souveraineté sur les eaux nationales, sur le plateau continental, la zone contigüe, la zone économique exclusive, sur les sous-sols marins et fluviaux.

Considérant qu'il lui échoit l'obligation d'organiser et de réglementer la protection et l'exploitation de la faune et de la flore qui y croissent;

Considérant que la rationalisation de l'exploitation des ressources biologiques aquatiques exige la protection de la faune et de la flore maritimes et fluviales, le contrôle des méthodes de capture et des engins utilisés, ainsi que celui de la pression de pêche face au stock disponible.

Considérant que l'érosion de plus en plus accentuée du sol des régions montagneuses constitue un très grave danger pour l'avenir du pays;

Considérant que le site désormais dénommé Parc Marin de XXXXX est d'une importance majeure pour l'environnement naturel d'Haïti par ses richesses biologiques, historiques, culturelles, et scientifiques et qu'il incombe a l'Etat d'en assurer la protection et la préservation;

Considérant qu'il convient de déclarer le site désormais dénommé Parc de XXXXX Zone Réservée;

Sur le rapport des Ministres de l'Environnement, du Tourisme, de l'Agriculture des Ressources Naturelles et le Développement Rural, et de la Planification et après délibération en Conseil des Ministres.

Arrêté

Article 1.-
Est déclarée Zone Réservée la zone désormais dénommé Parc de XXXXX délimitée par le littoral et haute mer suivant les coordonnées GPS : Pin (1) XXXN, XXXW; Pin (2) XXXN, XXXW; Pin (3) XXXN, XXXW; Pin (4) XXXN, XXXW.

Cette zone comprend :

tous les mangliers situés à l'intérieur ou adjacents à cette zone y compris une zone de tampon de 25 mètres autour des mangliers ;

tous les récifs ;

toutes les iles ou ilots ;

tous les herbiers ;

tous les étangs séparés de la mer par moins de 100 mètres de terre ;

toutes les épaves ;

toute forme biologique ;

le fonds marin ;

et toutes les formes et structures naturelles ou créées par l'homme.

Cette zone comprend tout zone décrite comme plage ou littoral et, le cas échéant, s'étant jusqu'au niveau de la marée haute de la mer.

Le Parc Marin de XXXXX est déclaré Zone Réservée en vue de la mise en place de différentes zones de gestion visant 1) la protection de l'environnement 2) la protection de la biodiversité 3) le développement durable du tourisme 4) l'exploitation durable des ressources côtières, marines, et autres, spécifiquement les ressources de pêche 5) l'aménagement durable des villes et des campagnes.

Article 2.-

Tous les droits de propriété dans cette zone seront respectés. Toute activité et tout développement dans cette zone ou dans les zones adjacentes ne devront en aucun cas aller à l'encontre des stipulations de l'Article 1 susmentionné.

Article 3.-

Un comité composé de membres du secteur publique et privé sera mis en place et sera chargé de la surveillance et de la gestion durable de cette zone.

Article 4.-
Le présent Arrêté sera publié et exécuté à la diligence des Ministres de l'Environnement, du Tourisme, de l'Agriculture des Ressources Naturelles et du Développement Rural, et de la Planification, chacun en ce qui le concerne.

Donné au Palais National, à Port-au-Prince, le _____ 20XX, An XXX de l'Indépendance.

Par le Président
Le Premier Ministre
Le Ministre de l'Environnement
Le Ministre du Tourisme
Le Ministre de l'Agriculture, des Ressources Naturelles et du Développement Rural
Le Ministre de la Planification