

**The Proposed Reintroduction of the Antillean Manatee (*Trichechus manatus manatus*)
in the Grand Cul de Sac Marin Bay, Guadeloupe (FWI):
An Innovative Challenge of Collaboration with the Fishing Community**

**El Proyecto de Reintroducción del Manatí Antillano (*Trichechus manatus manatus*)
en la Bahía del Grand Cul-de-Sac Marin in Guadalupe (FWI):
Un Desafío Innovador de Colaboración con la Comunidad Pesquera**

**Le Projet de Réintroduction du Lamantin des Antilles (*Trichechus manatus manatus*)
dans la Baie du Grand Cul-de-Sac Marin en Guadeloupe:
Un Défi Innovant de Collaboration avec la Communauté des Pêcheurs**

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ABSTRACT

With support from the French Department of Ecology, the National Park of Guadeloupe has taken careful steps to assess the feasibility of reintroducing Antillean manatees to the waters of the Grand Cul-de-Sac-Marine bay (GCSM), a large protected area of 15,000 ha. Although manatees were extirpated from Guadeloupe several decades ago, the waters of the GCSM bay are well protected, including enforced no-entry zones, and have relatively little boat traffic or other threats to manatees. A number of meetings have been organized in recent years to involve and inform the project's stakeholders, including but not limited to fishermen, boaters, tourism operators, environmental non-governmental organizations and community leaders. Formal agreements with local fishing organizations and excellent relationships with communities (including "Lamentin" - French for manatee) are attempting to secure local support of a re-introduction effort. Special attention has been paid to developing a dialog with local fishing groups. The National Park of Guadeloupe (PNG) and the Fisheries Committee of Guadeloupe (CRPM) have jointly decided to conduct a study to assess the potential impact of the presence of manatees on fishing activities and *vice versa*. This effort lies within the framework of a wider cooperative agreement promulgated and formally initiated in February 2011 between the PNG and the CRPM. Furthermore, representatives of the fishing communities in Guadeloupe met with their counterparts in Puerto Rico in September 2011 to discuss the experience that the latter group has had involving interactions between manatees and fishing activities, and the possible effects on fishing.

KEY WORDS: Reintroduction, Antillean manatee, Guadeloupe

INTRODUCTION

West Indian manatee, an endangered species according to the IUCN Red List of Threatened Species, is present in 20 range states in the wider Caribbean, but the sizes of these populations are reported to be small (fewer than 100 individuals) and in decline in 14 of those 20. In addition, in many range states, persistence of manatees is threatened by incidental takes in fishing gear, poaching, contaminants, and habitat destruction. Furthermore, although protective legislation exists and Marine Protected Areas have been created, economic constraints prevent both enforcement of laws and effective infrastructures for conservation to function. Thus, manatees could easily disappear within the foreseeable future from most Caribbean countries and territories they inhabit today. In such a grim situation, creative and collaborative approaches and actions should be considered to conserve remaining manatees and, as possible, facilitate the establishment and growth of new populations.

The National Park of Guadeloupe (Figure 1) has undertaken an ambitious project: re-establishing the West Indian manatee in the the "Grand Cul-de-Sac Marin" bay (Figure 2). This large marine and coastal protected area is currently managed by the National Park. Manatees were extirpated from the waters of Guadeloupe several decades ago by hunters for food, but nowadays the Grand Cul-de-Sac Marin represents a well-managed area with relatively few, minor threats to manatees, compared to many other locations in the wider Caribbean.

The project is part of a larger initiative that seeks to:

- i) Overcome and reverse loss of biodiversity in Guadeloupe;
- ii) Improve the global conservation status of the species and subspecies by restoring a population in Guadeloupe and thus diversify the survival of the species. It could also contribute in the long term at a progressive recolonization of the species in the Lesser Antilles in order to restorate a link between populations now disconnected; and
- iii) To provide a transferable model for other conservation projects.

After years of individuals and citizen initiatives, a feasibility study (Lartiges et al. 2002) concluded that the reintroduction of manatees had merit, even if hurdles needed to be overcome to ensure success. The conclusion was echoed by the

assessment of the Mote Marine Laboratory (Reynolds and Wetzel 2008) during a workshop in April 2008 in Guadeloupe. Factors that will contribute to the possible success of the project include:

- i) The large area of seagrasses (about 5,500 ha) within a protected marine park,
- ii) presence of little boat traffic and relatively few other apparent threats, and
- iii) general acceptance (and even some enthusiastic endorsement) of agency scientists and managers, politicians, and local citizens around the Grand Cul-de-Sac Marin bay.

The first part of the project is the preparation phase which began in 2010 for about four years. During this phase, studies of environmental contaminants of seagrasses and sediments, seagrass productivity, and socio-economic factors will be done. In addition, there will be discussions with regard to the optimal location(s) from which manatees might be taken to populate the new area, and to organize a cooperative network of scientists and managers from various Caribbean countries to advise the project.

The second part, the implementation and monitoring phase, will last about five years, and involve the actual reintroduction of selected manatees. It will begin once everyone is assured that environmental and other possible threats to manatees have been identified and are under control. The reintroduction will involve soft releases and VHF and satellite monitoring of the animals.

The success of the project depends to a large extent on its endorsement by the people of Guadeloupe with special attention to the fishing community.

HOST SITE OF THE PROJECT

Name: The Grand Cul-de-Sac Marin bay (Figure 2)

Main characteristics:

- i) About 15 000 ha,
- ii) Three habitats : mangroves, seagrass beds and coral reefs,
 - 5,500 ha of seagrass beds,
 - 6,000 ha of mangroves
 - 25 Km long of coral reef
- iii) Several rivers flowing in the bay
- iv) Six protected sites as core zones of the National Park surrounded by the a marine buffer zone
- v) Extirpation of manatee at the beginning of the 20th century (hunted for food)
- vi) RAMSAR and MAB site
- vii) Human activities (with a population around the bay of 120,000 inhabitants)
 - Tourism (boats, kayaks...)
 - Fishery (small boats with gillnets and a majority of traps)
 - Diving, snorkeling
 - Boat traffic/transit to go out of the bay



Figure 1. Location of Guadeloupe and its National Park.

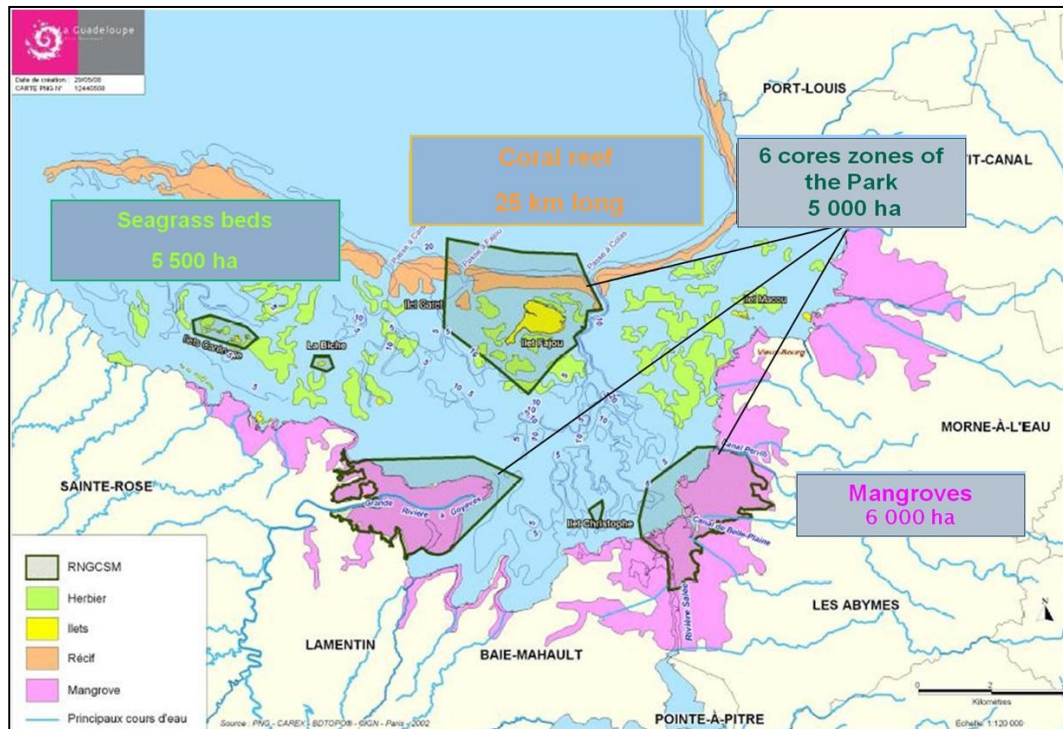


Figure 2. The Grand Cul-de-Sac Marin Bay.

CONTEXT AND ISSUES

The manatee, an herbivorous aquatic mammal, was present at the precolombian time around the majority of Lesser Antilles (Figure 3).

The decrease of this specie began after the colonization. In Guadeloupe, the size of the population has seriously decreased in the middle of the XVIII century, to lead to its extinction at the beginning of XX century because of an intensive hunting for food.

Today, the sub-specie *Trichechus manatus manatus* is not anymore present in the Lesser Antilles. The nearest populations are located in Northern, in the Greater Antilles (Puerto Rico, Dominican Republic) and in Southern, in Trinidad and Tobago (Figure 3).

Among its various ambitions, the project aims to:

- i) Overcome and reverse loss of biodiversity in Guadeloupe (biodiversity restoration),
- ii) Improve the global conservation status of species and subspecies,
- iii) Provide a transferable model for other conservation projects,
- iv) Improve the environmental quality of the bay,
- v) Develop sustainable tourism,
- vi) Make of the bay an exemplary site of environment management with of all Guadeloupe stakeholders, and
- vii) Improve the ecological awareness among citizens

THE STUDY OF THE POTENTIAL IMPACT OF THE PRESENCE OF MANATEES ON FISHING ACTIVITIES AND VICE VERSA

Commercial fishing in the Grand Cul-de-Sac Marin bay (GCSM) is practiced mainly in the traditional way with boats not exceeding 12 meters in length (7 m average) and mainly use traps and gill nets. Most nets are used outside the reef in depths more than 20 m.

Just like many fisheries, fishermen from the GCSM bay experience for many years a number of difficulties including a decrease of the resource, resulting in a low attractiveness of the activity for young people. Despite the historical presence of this aquatic mammal in the waters of Guadeloupe, the possible return of the manatee is perceived by a large proportion of fishermen as a new potential threat to the profession. The main fear is based on the appearance of more restrictive regulations regarding fishing and navigation, to protect the manatees reintroduced.

A literature review on the biology and behavior of the manatee in the Caribbean countries has helped focus areas of the GCSM bay which might be favorable to its installation and identify fishing gear and practices used in the bay that may interact negatively with the manatee.

Firstly, shallow waters (less than 2 meters) with the presence of seagrass are sites where manatees can spend hours a day feeding. Potential areas to rest and reproduction of the animal were identified. Finally, areas of fresh water supply (necessary to the manatee) have been also listed and some of them are known to be historically occupied by the manatee.

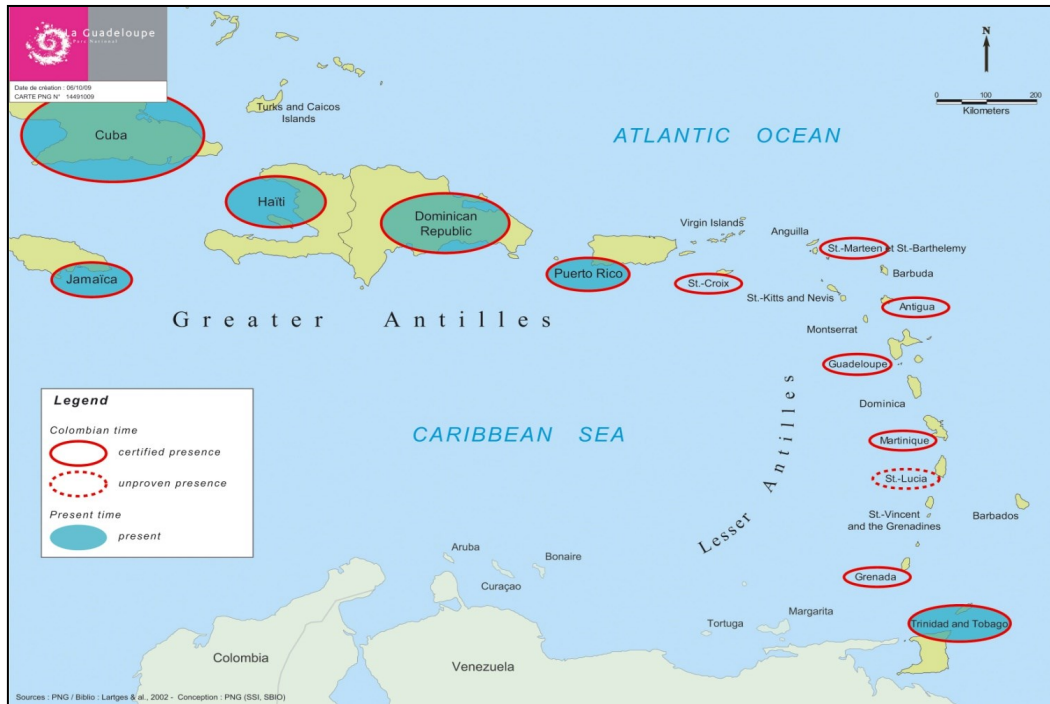


Figure 3. Distribution of Antillean Manatee in the Antilles area (from Lartiges et al. 2002).

Despite this information it is difficult to accurately predict the occupation of manatees in the GCSM bay. However, these animals tend to prefer quiet environments and shallow waters, and thus, the coral reef can be regarded as a theoretical limit of the manatee occupation due to the current and agitation caused by waves beyond it. Moreover, in light of the experiences in other countries of the Caribbean and the small number of manatees reintroduced, the literature review concluded that the impacts on fisheries may be priori considered very low.

Direct disturbance that can cause manatees on commercial fishing, are related to navigation and destruction of fishing gear. Collisions with boats are one of the first causes of mortality of manatees in the Caribbean (especially in the US). However this risk has been assessed as minor in the GCSM bay. Indeed, the good ability of detection and avoidance of the manatees, the low density of the animals in the environment and the small number of professional fishing boat (about 120 – 140) predicts a low probability of collision. This risk increases significantly in areas less than 2 m depth. The consequences of these interactions result most of the time by lacerations of the skin and flesh of the animal, without consequences on motors or boats. Despite these injuries may occur several times in the life of an animal, its relative robustness allows frequently a proper healing.

Disturbances that can cause the manatee on fishing activities result in entanglement in fishing gear and can lead to their loss or destruction. Gillnets are the only gears likely to be affected. This risk of entanglement greatly

increases with the mesh size of the net. Thus, gill or trammel nets designed to capture species of large size present the greatest risk.

To better assess these risks, the impact study also focused on the investigation of a sample of 60 professional fishermen representative of the 120 – 140 fishermen active in the bay. Information collected allowed assessing their practices and fishing sites.

Analysis of these data revealed that the majority of fishing is practiced outside the reef barrier, and thus, the majority of the sample has an almost zero risk of being disturbed by the manatee. The few fishermen that could be potentially impacted could be affected in very different ways depending on the type of gear, its depth and location of use. Thus, a more detailed analysis assessed that only two fishermen in the sample could be really affected. These vulnerable fishermen are characterized by fishing practices undiversified using gill net between 0 and 5 meters deep. By comparing this result to the entire population of fishermen in the GCSM bay, it has been estimated that nine fishermen may be penalized by the manatee.

Fishermen surveyed were also asked about their needs or expectations for assistance in the fisheries sector. Thus, they are a majority to seek to increase the fight against informal fishing that causes real economic harm. They also call for better development of the ports for the seafood marketing, storage of fishing gear or fish conservation. Finally, it was noted that some fishermen wish to diversify their activity into ecotourism and also turned on the manatee.

**SYNTHETIC OVERVIEW OF PROGRESS
MADE OVER THE 2010-2012 PERIOD
REGARDING THE PROJECT**

The developments fall into several categories:

Enhanced scientific guidance — An expert working group was formed to work with the staff of the National Park and with long-term project advisor, Dr. John Reynolds, in order to provide guidance and scientific expertise for the various aspects of the project, both at the local level and in terms of regional cooperation. The members of the group (chaired by Reynolds) include Dr. Thomas J. O'Shea (USA; former leader of the US Department of the Interior's Sirenia Project), Dr. Benjamin Morales (Mexico; current co-chair of the IUCN Sirenia Specialist Group), Mr. Patrick Rose (USA; Executive Director, Save the Manatee Club), Dr. Alejandro Acosta (USA; Member of the Board of Directors and Chairman of the Program Committee of the Gulf and Caribbean Fisheries Institute and leader in community-based fisheries management), and Ms. Haydee Dominguez (Dominican Republic; PhD student, Duke University, assessing status and conservation of manatees in that country).

Enhanced stakeholder involvement — A number of meetings have been organized over the past two years to involve and inform the project's stakeholders, including but not limited to fishermen, boaters, tourism operators, environmental non-governmental organizations NGO's, and community leaders. Also, several public meetings were held with the residents of the Grand Cul-de-Sac Marin to present the project, answer questions, and allow individuals and groups to voice their feelings about the project and its possible ramifications. In addition to the informational meetings, the National Park has organized workshops with users of the bay to work cooperatively to develop implementable solutions to address potential threats and manage potential usage conflicts. Special attention has been paid to developing a dialog with local fishing groups. The PNG and the Fisheries Committee of Guadeloupe (CRPM) have jointly decided to conduct a study to assess the potential impact of the presence of manatees on fishing activities and *vice versa*. This effort lies within the framework of a wider cooperative agreement promulgated and formally initiated in February 2011 between the PNG and the CRPM. Furthermore, representatives of the fishing communities in Guadeloupe met with their counterparts in Puerto Rico in September 2011 to discuss the experience that the latter group has had involving interactions between manatees and fishing activities, and the possible effects on fishing.

Awareness programs — Representatives of the PNG are involved in frequent presentations about the project to local school groups. These programs were accompanied in

2010-2011 by a competition throughout the school district of Guadeloupe on the theme of the reintroduction of the manatee. The children in the class with the winning entry were flown to Florida to see manatees first hand and to meet experts on manatees and manatee habitat to discuss the project and its conservation implications.

Establishment of formal relationships with countries that may provide manatees for the project — A strategy for international cooperation was developed. Representatives of the PNG intend to present the project and the strategy document to potential donor countries. Presently, the project has been formally presented only to the government of Colombia, but a similar presentation is expected to take place with the government of Mexico in the upcoming months.

Assessment of the feasibility of using manatees from French Guiana — Dr. Nataly Castelblanco was hired by the project to do preliminary assessments of manatee distribution and relative abundance in French Guiana. The possibility of using manatees from that territory (which would minimize diplomatic issues and certain issues associated with permitting) first required that the relative abundance and availability of manatees be assessed. Dr. Castelblanco submitted a report of her activities, with recommendations, in mid-May 2012 for consideration by the Park staff and the expert working group.

Communicating the goals and approaches of the project to a number of professional audiences — Formal presentations regarding the project were made at a number of professional conferences to (a) provide transparency, and (b) solicit suggestions for improvements.

Issuance of a contract to rigorously assess literature and other information on reintroductions — The project team issued a contract to Dr. O'Shea and Dr. Reynolds to (a) review all available information (published and unpublished) on sirenian releases into the wild, and (b) review relevant literature regarding releases and reintroductions of large mammals in general. The goal of the contract was to establish the release criteria (e.g., using wild vs. captive manatees; the optimal relative age at which released animals succeed best; the best use of soft release facilities) that create the best possible chance for the manatee reintroduction project to succeed. The contract report is due in July, 2012.

Invitation of manatee rehabilitation experts — (Dr. James Powell, Dr. Thomas O'Shea, Dr. John Reynolds) to assess habitat in the Grand Cul-de-Sac Marin and recommend specific criteria for the optimal soft release facility. That process took place with the Park staff in late August, 2012.

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