

Managing the Gladden Spit Marine Reserve: An Analysis of the Whale
Shark Dive Tourism Industry in Placencia, Belize

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ABSTRACT

The Gladden Spit Marine Reserve is co-managed by Friends of Nature and the Government of Belize. A section of the reserve, known as the Whale Shark Zone, is managed for whale shark dive tourism as part of an initiative to shift the local economy away from the fishing industry that threatens the marine resources of Gladden Spit to a more sustainable and lucrative tourism industry.

A fee was assessed to visitors to the Whale Shark Zone in 2004 in order to generate revenue for managing the protected area. Concurrently, a survey was developed targeting visitors who had spent time diving and/or snorkeling in the Whale Shark Zone. The intent of the survey was to assess visitor willingness to pay, as well as to gather information on visitor demographics and their perceptions of their tourism experiences. In addition, an evaluation of management effectiveness at the Gladden Spit and Silk Cayes Marine Reserve was conducted, as well as an evaluation of the sustainability of the whale shark tourism industry under the management of Friends of Nature. The purpose of this project was to generate recommendations for the improvement of management of the Gladden Spit and Silk Cayes Marine Reserve.

Results indicate that many visitors would be willing to pay more than the fee of \$15 per day that was charged in 2004 to visit the Whale Shark Zone. Visitor perceptions of their experiences at Gladden Spit indicate overcrowding of tourists in the reserve, fewer sightings of whale sharks, and a desire for improved educational information about the reserve prior to tours. Recommendations for the improvement of the management of the Gladden Spit Marine Reserve are based on the results of the visitor survey and of the evaluation of the sustainability of the whale shark tourism industry.

Despite the challenges that Friends of Nature faces in managing the Gladden Spit and Silk Cayes Marine Reserve, the organization has established itself as a strong force in the effort to promote environmental and economic sustainability. One of the most significant resources at the disposal of Friends of Nature is the support of local communities. Belize has a strong commitment to environmental conservation, and people recognize the importance of maintaining the integrity of the country's natural resources to their own socioeconomic wellbeing. The challenge is to direct policy and management in such a way that the use of natural resources for the purpose of economic development, including tourism, is a sustainable process.

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	<i>BELIZE</i>	1
1.2	<i>GLADDEN SPIT AND SILK CAYES MARINE RESERVE</i>	5
1.3	<i>WHALE SHARK TOURISM</i>	13
2	METHODS.....	14
2.1	<i>INTRODUCTION TO METHODS</i>	14
2.2	<i>METHODS FOR IMPLEMENTING TOURISM USER FEES</i>	15
2.3	<i>SURVEY METHODS</i>	17
2.4	<i>SURVEY ANALYSIS METHODS</i>	21
2.4.1	<i>Statistical and Economic Analysis Methods</i>	21
2.4.2	<i>Methods for Analysis of Visitor Comments</i>	22
2.5	<i>METHODS FOR EVALUATION OF MANAGEMENT EFFECTIVENESS</i>	23
2.5.1	<i>Introduction to Management Effectiveness Evaluation</i>	23
2.5.2	<i>Evaluation of Management Effectiveness for the Gladden Spit Marine Reserve</i>	24
2.6	<i>METHODS FOR EVALUATION OF THE SUSTAINABILITY OF WHALE SHARK TOURISM</i> ...	25
3	RESULTS.....	25
3.1	<i>STATISTICAL AND ECONOMIC ANALYSIS RESULTS</i>	25
3.2	<i>RESULTS OF ANALYSIS OF VISITOR COMMENTS</i>	31
3.3	<i>RESULTS OF EVALUATION OF MANAGEMENT EFFECTIVENESS</i>	34
3.4	<i>RESULTS OF EVALUATION OF THE SUSTAINABILITY OF WHALE SHARK TOURISM</i>	37
4	DISCUSSION.....	43
4.1	<i>WHALE SHARK TOURISM</i>	43
4.2	<i>MANAGEMENT</i>	48
4.3	<i>SUSTAINABILITY</i>	48
5	RECOMMENDATIONS.....	51
5.1	<i>RECOMMENDATIONS FOR WHALE SHARK TOURISM</i>	51
5.2	<i>RECOMMENDATIONS FOR IMPROVING THE OVERALL MANAGEMENT OF GLADDEN SPIT AND SILK CAYES MARINE RESERVE</i>	54
5.3	<i>RECOMMENDATIONS FOR ENHANCING THE SUSTAINABILITY OF PROJECTS AT GLADDEN SPIT</i>	56
6	CONCLUSION.....	57
7	LITERATURE CITED.....	58

LIST OF FIGURES

FIGURE 1. MAP OF CENTRAL AMERICA..... 3
FIGURE 2. MAP OF BELIZE 6
FIGURE 3. MAP OF GLADDEN SPIT AND SILK CAYES MARINE RESERVE ZONES..... 8
FIGURE 4. HUMAN ECOLOGY OF THE MANAGEMENT OF THE GLADDEN SPLIT AND SILK CAYES
MARINE RESERVE 12
FIGURE 5. CODING SCHEME APPLIED TO VISITOR COMMENTS TO ANSWER THE QUESTION, ‘WHAT
WERE THE MOST PREVALENT SUGGESTIONS THAT VISITORS MADE FOR THE ENHANCEMENT OF
THEIR EXPERIENCE AT GLADDEN SPIT?’ 23
FIGURE 6. VISITOR PERCEPTIONS OF CROWDING 28

LIST OF TABLES

TABLE 1. NUMBER OF VISITORS TO THE WHALE SHARK ZONE AND SURVEY PARTICIPANTS IN 2004
..... 25
TABLE 2. AVERAGE IMPORTANCE RATING OF FACTORS IN CONSIDERING A VISIT TO GLADDEN SPIT
..... 29
TABLE 3. SUMMARY OF VISITOR SUGGESTIONS TO ENHANCE THE EXPERIENCE AT GLADDEN SPIT
..... 33

APPENDICES

APPENDIX A. 2004 WHALE SHARK SURVEY
APPENDIX B. LIST OF DIVE TOUR OPERATORS
APPENDIX C. CHARACTERISTICS OF SOUND INSTITUTIONS

1 INTRODUCTION

1.1 Belize

Belize is a small Central American nation, roughly the size of Massachusetts. It shares borders with Mexico to the North and Guatemala to the West and South; its East coast borders the Caribbean Sea (Figure 1). Belize gained its independence from Britain in 1981, although it remains a member of the Commonwealth of England.¹ The country is a sovereign, democratic state with a system of government based on the principles of Parliamentary Democracy. Leadership is represented by a Prime Minister and a Cabinet, which comprise the Executive Branch. The country is divided into six administrative districts, and each district's administration is carried out jointly by a District Accountant, the Officer Commanding the District Police and heads of government departments that vary among districts. At the town level, each community has a locally elected Town Board consisting of seven members. The decentralized nature of the government of Belize affords citizens generous opportunities for participation. However, despite the basic framework for strong governance, the country is often characterized by corruption, a lack of transparency and accountability, and a lack of resources.

The judicial system is well-established in Belize and there is a mechanism for providing the public with access to legal information. The Government of Belize maintains a website called the Gazette that provides electronic access to legal documents as they are generated. Legal information such as newly passed statutory instruments is also printed in newspapers. Similarly, the government of Belize maintains a website for the dissemination of general information on the judiciary system and the laws of Belize (Ministry of the Attorney General of Belize). However, once again as a result of a lack of resources, many laws are never enforced.

¹ Unless otherwise noted, the information in this section is from Government of Belize. About Belize. <http://www.belize.gov.bz/belize>.

Belize is characterized as a developing nation with a small, open economy. However, as a result of its rich natural resources and a relatively small population of only 273,000 people, the socioeconomic conditions in Belize far surpass those in neighboring countries. Belize has traditionally derived economic benefits from harvesting timber, agriculture and fishing. However, the timber industry is largely exhausted, and agriculture has suffered from a series of strong hurricanes and diseased crops. Over fishing has also become a serious concern in the country. Marine products and fisheries constitute only a small portion of exports, and fisheries resources are mainly used domestically. Of those that are marketed outside of Belize, a significant percentage of marine product exports are sold under preferential arrangements that provide producers (i.e., fishermen) with profits from higher prices than world market prices would provide. These arrangements are not consistent with the trend towards global free trade, and the Belizean Government plans to gradually phase out preferential pricing.

In response to pressures on the timber, agriculture and fishing industries, Belize has capitalized on its natural resources to develop an ecotourism industry. From 1997 through 2001, tourism represented an average of 20.2% of GDP within Belize. In some locations, tourism has become the primary source of economic gain.

Endowed as it is with rich natural resources, both terrestrial and marine, the government of Belize has traditionally maintained a strong ideological commitment to environmental conservation and sustainable development. In practice however, a lack of government resources often impedes the successful and efficient achievement of environmental and development goals. There are also deficiencies in the country's law enforcement capabilities that limit regulatory efforts, which the government is working to overcome (U.S. Department of State).

There are a number of agencies within the government that have the authority to regulate use of the nation's natural resources, including those utilized for tourism purposes. In 1989, the Department of the Environment was established, and in 1992 the passage of the Environmental Protection Act conferred statutory power to the department with regard to a broad range of environmental issues. The Belize Tourism Board functions within the Ministry of Tourism to promote partnerships between the public and private sectors to develop, market, and implement tourism programs.

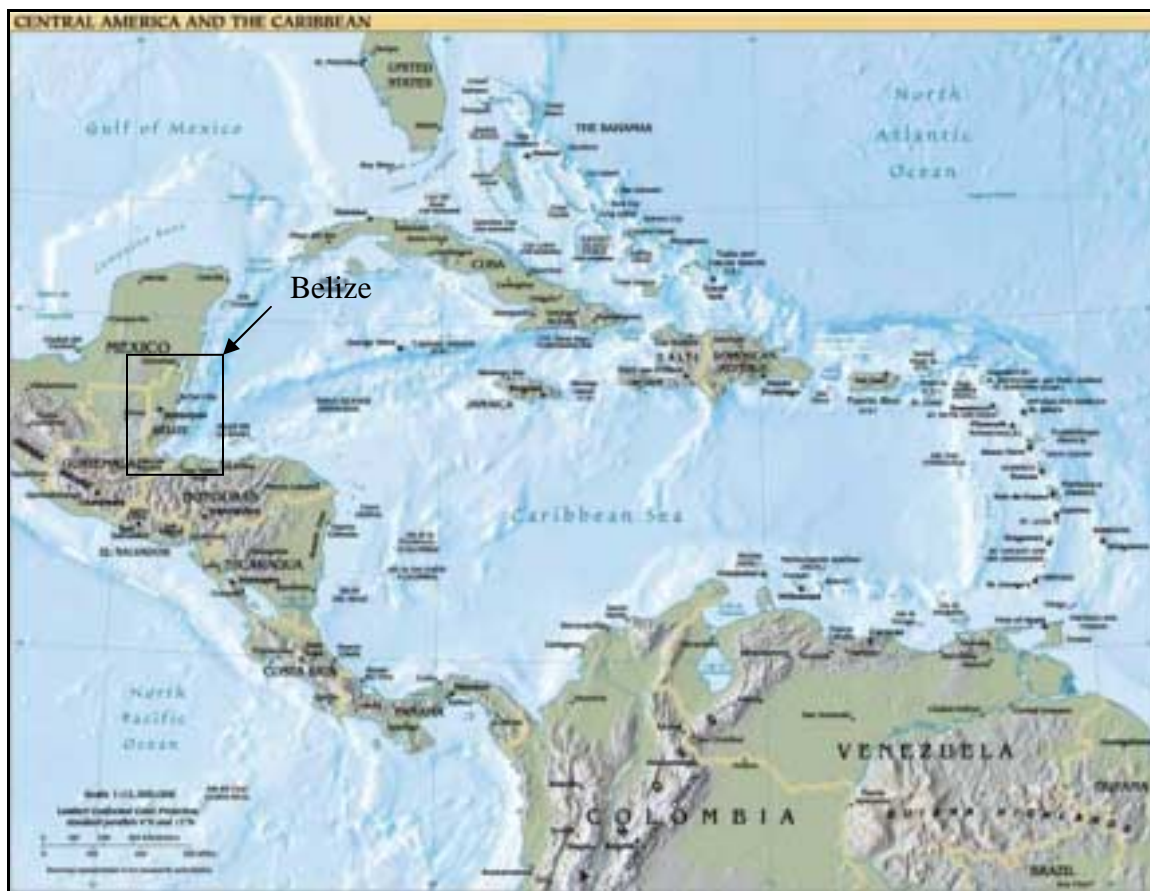


Figure 1. Map of Central America

In 1965, the Belize Fisheries Department was established within the Ministry of Agriculture and Fisheries to manage the fisheries industry. Also within the Ministry of

Agriculture and Fisheries, the Coastal Zone Management Authority and Institute exists as the agency most influential in the oversight of marine and coastal resources in Belize. The agency, jointly established with the Coastal Zone Management Advisory Council in 1998 by the Belize Coastal Zone Management Act, serves as an autonomous public statutory body that is mandated to develop, implement and monitor the coastal zone management and development policies of Belize (Belize Coastal Zone Management Authority and Institute). The Ministry of Natural Resources and the Environment houses the Forest Department and the Department of the Environment, which are also both involved in managing coastal resources.

There is a thriving and growing civil society in Belize, representing a variety of sectors and interests related to the management of marine and coastal resources, and advocating for the conservation of natural resources and sustainable development.

The government of Belize recognizes a number of national marine parks and protected areas, but unfortunately this classification is not always synonymous with true marine protection. There are 14 Marine Protected Areas in Belize, although a formal network to connect them and their respective management and administration has not yet been created. The Fisheries Department, which is responsible for the management of Marine Reserves, has the authority to manage eight of the Marine Protected Areas in Belize. The Forest Department, which is responsible for protected areas management of Natural Monuments, National Parks, Wildlife Sanctuaries and Forest Reserves, has the authority to manage the remaining six Marine Protected Areas (Belize Coastal Zone Management Authority and Institute). Seven of the MPAs are co-managed by one of these two departments and an NGO. One such MPA is the Gladden Spit and Silk Cayes Marine Reserve.

1.2 *Gladden Spit and Silk Cayes Marine Reserve*

The Gladden Spit and Silk Cayes Marine Reserve (GSSCMR) lies 36 km directly east of Placencia Village, a small fishing community located at the tip of a peninsula in southern Belize (Figure 2). GSSCMR is part of the Meso-American Reef, the largest barrier reef in the Western Hemisphere. The reef supports more than 500 species of fish, many of which in turn support the livelihoods of local fishermen (Friends of Nature, *Gladden Spit*).

GSSCMR contains an intact spawning aggregation site for at least 25 species of reef fish, resulting in a continuous replenishment of fisheries in Southern Belize (Friends of Nature, *Gladden Spit*). The marine reserve is threatened by unsustainable fishing practices, such as the use of gill nets, and anchor damage to reefs (Friends of Nature, *Gladden Spit*). Over fishing has reduced critical fish species populations, threatening their long-term survival in GSSCMR and throughout the Meso-American Reef.

The health of the fish spawning aggregation sites is directly correlated with the presence of one of the major tourist attractions in the waters off of Belize. Large concentrations of whale sharks, which come to feast on fish larvae, appear annually during the late spring and early summer (Friends of Nature, *Gladden Spit*).

The whale shark is the world's largest fish, growing up to 60 feet in length (The Nature Conservancy). It is found in warm waters in open seas near the equator, throughout the Atlantic, Pacific and Indian Oceans. It is a pelagic species and is often seen very far offshore, either individually or in schools. However, it can also be seen in inshore waters. It is highly migratory,



Figure 2. Map of Belize

thought to follow changes in water temperature or planktonic blooms. Whale sharks, which are filter feeders, eat plankton.

The whale shark is relatively scarce and poorly understood. Whale sharks are classified as “vulnerable” on the International Union for Conservation of Nature and Natural Resources' redlist of threatened species (IUCN). A species is “vulnerable when it is not critically endangered or endangered but is facing a high risk of extinction in the wild in the medium-term future” (IUCN). Some of the factors contributing to this status include depletion due to harpoon fisheries in several countries, incidental capture in other fisheries, a high value in international trade, the characteristics of its life history, a highly migratory nature, and low abundance. In addition, dive tourism focused on the whale shark has grown rapidly around the world in recent years, including at the GSSCMR in Belize (IUCN).

GSSCMR spans an area of 105 km² (Friends of Nature, *Gladden Spit*). Figure 3 depicts how the reserve is divided in four zones: 1) a General Use Zone, 2) a Conservation Zone that was established around three small islands known as the Silk Cayes, 3) a Restoration Zone for the re-establishment of conch, and 4) a Special Use area known as the Whale Shark and Spawning Zone (Friends of Nature, *Gladden Spit*). The Whale Shark Zone (WSZ) consists of an area that is 5 km² (Friends of Nature, *Gladden Spit*). The WSZ is located in an area also known as “Point of Reef,” where the coral reefs come to an apex and the adjacent waters drop from a depth of 40 to 2000 meters (Friends of Nature, *Gladden Spit*). The WSZ is utilized by three main stakeholders including tourists, researchers and fishermen.

The non-governmental organization (NGO) Friends of Nature (FoN), which was founded in 1996, was selected by the Belizean government to co-manage GSSCMR with the Belizean



Figure 3. Map of Gladden Spit and Silk Cays Marine Reserve Zones

Fisheries Department (Friends of Nature, *Gladden Spit*). The mission of Friends of Nature is to ensure that:

Regional ecosystems with their rich biological, social and cultural diversity are healthy and productive and sustained by empowered and prosperous resource users who live and work in harmony with their environment. Its mission is to manage, protect and promote the sustainable use of its surrounding geographical environment by involving and educating resource users for the benefit of present and future generations. Friends of Nature fosters initiatives that strengthen the relationship between environmental protection and building sustainable livelihood at the community level. The organizational motto is “protecting our natural resources by developing our human resources (Friends of Nature, *Gladden Spit*).

In consultation with Community Advisory Groups from five local communities that have traditionally used the resources of the GSSCMR, FoN created a Management Plan for the reserve. FoN receives considerable support from international organizations, as well as from local stakeholders and the Belizean government, to carry out the policies and meet the goals outlined in the Gladden Spit and Silk Cayes Marine Reserve Management Plan.

The legal mandates that pertain to the GSSCMR include both domestic Belizean legal mandates and international conventions and treaties. On May 18, 2000, the Belizean Minister of Agriculture and Fisheries declared GSSCMR a marine reserve by passing Statutory Instrument 68 (Friends of Nature, *Gladden Spit*). A second statutory instrument, S.I. 91, passed in 1992, and details regulations pertaining to activities in marine reserves and penalties for violating these regulations without license (Friends of Nature, *Gladden Spit*). In May 2002, a Memorandum of Understanding was issued for the co-management of GSSCMR between the Belizean

Department of Fisheries and Friends of Nature (Friends of Nature, *Gladden Spit*). The 2003 Management Plan for GSSCMR provides a summary of regulations specifically for the reserve, particularly regarding tourist interaction with whale sharks within the WSZ (Friends of Nature, *Gladden Spit*).

There are a number of international conventions and treaties to which Belize is party that pertain to the GSSCMR. Belizean domestic policy is generally consistent with the ideals and goals of these international conventions and treaties, although due to a lack of resources within the country the manifestation of these ideals in policy is not always evident. Similarly, actions that reflect that policies have been developed to be consistent with international treaties are not always possible due to restricted funding, personnel and other resources. The conventions and treaties that Belize is a party to include the following:

- Convention on Biological Diversity
- The Jakarta Mandate
- United Nations Convention on the Law of the Sea
- Agenda 21
- United Nations Agreement on Straddling and Highly Migratory Fish Stocks
- United Nations Environment Program Conference on Protection of the Marine Environment from Land-based Activities
- Convention on International Trade in Endangered Species
- Cartagena Convention
- World Heritage Convention (Friends of Nature, *Gladden Spit*)

The human, or cultural, ecology associated with a coastal environment consists of both “the human constituencies of the coastal environment itself and the humans who constitute the policy and management structures whose decisions and actions affect the behavior of coastal constituencies” (Orbach). Figure 4 depicts the components of the coastal ecology of the GSSCMR, and specifically of the Whale Shark Zone within the reserve.

The physical environment of the WSZ includes the water within the zone, the whale sharks and the spawning fish associated with the zone, as well as other species that are found in the zone, including various species of shark. The scientific community that has a stake in the WSZ includes researchers, who consist mainly of foreign members of the science community, and to a limited extent also includes scientists from the University of Belize, NGOs, and the Belizean government.

The human constituents that represent stakeholders include tourists who visit the WSZ of the GSSCMR to participate in scuba diving and snorkeling activities. Other stakeholders include dive business operators and representatives of the tourism industry such as hotel and restaurant owners. Fishermen also use the resources of the reserve; legal fishermen include those that have been issued a license to fish inside the WSZ, and illegal fishermen primarily include foreigners who enter the reserve under the dark of night from Guatemala and Honduras and leave before daylight (Friends of Nature, *Gladden Spit*).

Other human constituents include local community members who profit indirectly from the economic benefits of the tourism industry. International NGOs represent specific interests such as the environment and sustainable development, and include The Nature Conservancy, the World Wildlife Fund, Conservation International, the Oak Foundation, and the regional

cooperative organization of NGOs called TriGOH. TriGOH is a tri-national alliance of nine NGOs from Belize, Guatemala and Honduras (Friends of Nature, *Gladden Spit*).

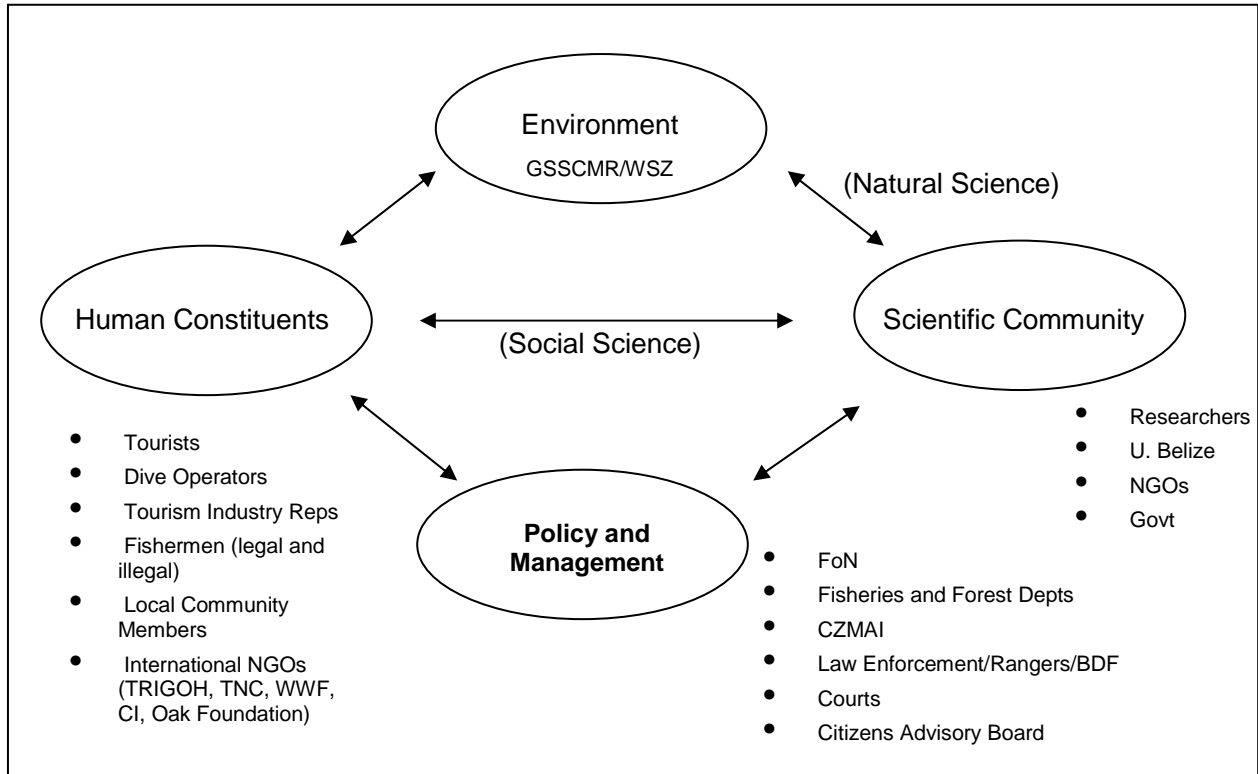


Figure 4. Human Ecology of the Management of the Gladden Split and Silk Cayes Marine Reserve (adapted from Orbach, *The Cultural Ecology of Coastal Public Policymaking*)

Policy and management organizations can include federal, regional and local legislative bodies, administrative agencies and courts. In Belize, the policy and management organizations that have a stake in the management of the GSSCMR include the Belize Fisheries Department, which has regulatory authority over the reserve and shares management responsibilities with Friends of Nature (Friends of Nature, *Gladden Spit*). FoN, in addition to undertaking the majority of management responsibilities for the reserve also provides law enforcement within the reserve through staff hired as rangers. Other sources of law enforcement include officers from

the Belize Defense Force, who are responsible for patrolling the reserve. The Belizean Coastal Zone Management Authority and Institute influence policy and management decisions related to marine reserves, but do not currently possess any regulatory power (Friends of Nature, *Gladden Spit*). Judicial oversight is provided by the Belizean courts. Development of management and policy occurs with the input of community based advisory boards.

The Gladden Spit and Silk Cayes Marine Reserve is an example of a situation in which management is both a domestic and international concern, as the resources of the reserve are regional in scope. The policy problem of how to manage a rich marine reserve with multiple stakeholders is compounded by the problems of a country facing economic development issues, political corruption and oftentimes a lack of legal authority and enforcement. There are also a number of weaknesses in the Management Plan for the reserve that preclude the goal of protecting marine biodiversity and promoting sustainable economic development, such as a lack of clear timelines for all goals and objectives. One of the greatest challenges that FoN faces in managing Gladden Spit is to develop and implement a plan to make the management and operation of the reserve economically sustainable while at the same time meeting conservation goals.

1.3 *Whale Shark Tourism*

Fishermen first noticed the recurring presence of whale sharks at Gladden Spit in the 1920s. However, it was not until 1997 that a team of scientists and local fishermen began to investigate the reasons for this phenomenon. They discovered that the presence of whale sharks in the area during the full moon from March through June coincided with the spawning of particular species of snapper, and concluded that the whale sharks had gathered to feed on the eggs. It was at this time that the first tourists visited the area now known as the Whale Shark

Zone in order to dive and snorkel with the whale sharks (Friends of Nature, *Gladden Spit*). Due to the unique predictability of the presence of whale sharks at the same location on an annual basis, the whale shark tourism industry developed rapidly. In 1997, the industry was represented by one tour operator; in 2004 there were 22 tour operators. From 2002 to 2004, there was an increase in the number of whale shark visitors from 500 to 1089 visitors (Jones).

The increase in the whale shark tourism industry is due in part to a partnership between the U.S.-based NGO, The Nature Conservancy, and FoN. To reduce the economic dependency of local fishermen on spawning aggregation sites for fishing, FoN and TNC, along with the Belizean government and other international NGOs, are working to develop alternative sources of income for local communities. A number of fishermen have been trained and certified as dive and sport-fishing guides, providing them with the opportunity to earn more from the spawning sites as guides than they could from commercial fishing.

Efforts to effectively manage and protect the spawning aggregation sites are also aimed at sustaining an ecotourism destination for visitors who want to view the whale sharks. To this end, tourism user fees were implemented during the 2004 whale shark season to generate revenue for the management of GSSCMR. Concurrently, in an endeavor to assess visitor willingness to pay for a whale shark tourism experience and to evaluate the effectiveness of marine and coastal management efforts by FoN and the Belizean government with respect to the GSSCMR, and particularly within the WSZ, a socioeconomic survey was designed to administer to divers and snorkelers visiting the reserve during peak whale shark tourism months in Placencia.

2 METHODS

2.1 Introduction to Methods

The methodology used to conduct the data collection and the data analysis for this project is summarized in this section. Specifically, the methods for implementing tourism user fees, the methods used to conduct the visitor survey, the methods associated with the analysis of survey data, the methods used to evaluate management effectiveness of Gladden Spit, and analysis of the sustainability of whale shark tourism are all discussed.

2.2 Methods for Implementing Tourism User Fees

Tourism user fees represent one type of income-generating mechanism that can be implemented to earn revenue to finance a protected area. A user fee is defined as a “fee charged to visitors to a protected area for the use of a service or a particular opportunity offered by the site that incurs a cost higher than that covered by the entrance fee” (Drumm and Moore). An ecotourism site should establish an objective to generate enough income to cover its operating costs plus a surplus to invest in conservation and community development priorities (Drumm and Moore).

The Nature Conservancy has implemented a pilot project aimed at meeting the need for broader application of appropriate mechanisms for realizing the economic value of recreation in protected areas (Drumm). The Gladden Spit Marine Reserve in Belize, along with two other sites located in Bolivia and Mexico, was selected to participate in this tourism user fee initiative (Drumm). As an initial step, a tourism diagnostic was conducted for Gladden Spit to determine a visitor profile, principal activities, access points, tourism industry structure, and future trends. In addition, stakeholders were identified and consultations were held in order to evaluate tour operator opinion and willingness to participate in the tourism user fee implementation, as well as to assess local community expectations. The Nature Conservancy also recommended a visitor registration system for Gladden Spit.

Carrying capacity for the protected area was estimated, resulting in the establishment of a system of scheduling access to the Whale Shark Zone by tour operators. It was determined that a maximum of six vessels with a capacity limit of 12 divers each can be in the Whale Shark Zone for one 2 hour slot per day during whale shark season, which occurs between March 1st and June 31st. A pilot willingness to pay study aided in determining an appropriate fee of \$15 per person per day for the Whale Shark Zone and \$10 for the rest of the Gladden Spit and Silk Cayes Marine Reserve. These fees were set by FoN in consultation with local communities in 2003, and informational materials were designed and printed out to inform visitors and tour operators of the fee (Drumm). The fees are collected by Friends of Nature at the organization's office in Placencia Village. Tour operators determine how many tickets they will need to purchase based on the number of reservations for dive and snorkel trips each day. They then visit the FoN office to purchase tickets to Gladden Spit directly from FoN staff.

The national tour operator association of Belize invoked a six month notice norm which led to the cancellation of plans to implement the tourism user fee during the 2003 whale shark season (Drumm). Therefore, the fee was first implemented during the 2004 whale shark season, beginning in March. The implementation of the fee coincided with the administration of the 2004 visitor survey.

Additional steps that are outlined in the tourism user fee initiative included determining protected area management costs and tourism management costs for Gladden Spit; identifying income generation mechanisms; proposing income management; training tour guides and staff responsible for the sale of user fees; and proposing income management, distribution and investment. Throughout the process, priorities included transparency, consulting stakeholders, and capacity building of local partners (Drumm).

Currently, The Nature Conservancy is in the process of reviewing the results of the first year of the tourism user fee initiative by evaluating its effectiveness and making adjustments and recommendations to FoN and stakeholders. Evaluation of the 2004 entrance fee level of \$15 for the Whale Shark Zone took into account three considerations 1) willingness to pay for access to a managed area by a visitor; 2) comparison of fees charged at other similar sites; and 3) the need to cover the costs of the provision and maintenance of recreational opportunities (Drumm and Moore). Visitor willingness to pay for access to the Whale Shark Zone was determined by the analysis of visitor price responsiveness surveys, described below.

In 2003, the Coastal Zone Management Authority and Institute proposed that a standard fee of US\$10 for international visitors should be applied to all 14 Marine Protected Areas within Belize, with the exception of the Gladden Spit and Silk Cayes Marine Reserve and the Blue Hole National Monument, both considered sites of high value. Visits to these two sites would require payment of a fee of US\$30.

2.3 *Survey Methods*

A visitor survey was implemented in Placencia during the months of March through June, 2004. The survey, the complete version of which can be found in Appendix A, was designed by The Nature Conservancy and administered by volunteers and FoN staff. The survey targeted visitors who had spent time diving and/or snorkeling in the Whale Shark Zone of the Gladden Spit Marine Reserve. Prior to each survey, interviewers were provided with instruction regarding how to approach visitors. The goal of the survey was to develop a strategy for targeting as many of the whale shark tour operators as possible, and hence a maximum number of visitors. A list of tour operators offering trips to the whale shark zone can be found in Appendix B.

The first survey was conducted in March 2004. While there was no official test prior to this the month of March essentially served as a test run, as very few surveys were actually collected and therefore only limited data was generated. However, despite the small number of survey responses, the experience provided FoN and TNC with an opportunity to refine the approach to administering surveys prior to the month of April. The survey strategy employed during April was developed in part by FoN and TNC staff, and was further refined by survey volunteers and FoN management prior to the survey week, April 5th through 11th.

The survey strategy included a plan to approach visitors both on the water at the entrance to the Whale Shark Zone and at locations where dive boats returned to shore following dive and snorkel trips. Specifically, it was predetermined that for whale shark tours conducted by Robert's Grove, Hamanasi and Nautical Inn, all resorts located relatively far from the village of Placencia by car, a FoN employee based at the ranger station on Little Water Caye would approach visitors during their lunch break between dives. FoN planned to maintain daily communication with this employee via a VHS radio during the period of the survey in order to monitor survey progress with tour groups.

It was also predetermined that tour operators located in the village of Placencia, or within close proximity to the village, including Sea Horse, Natural Mystic/Splash, Nite Wind, Advanced Diving, Ocean Motion and Southern Belize Reef and Jungle, typically utilized three main docking locations. The first location, at the end of the Placencia peninsula in front of the FoN office, was the docking location of Sea Horse, Natural Mystic/Splash and Nite Wind. The second location, on the beach facing the East side of the peninsula, was where Advanced Diving and Ocean Motion returned passengers at the end of a tour. Finally, Southern Belize Reef and Jungle docked in the lagoon on the western side of the peninsula where its shop is located. The

survey strategy provided for one survey administrator to be positioned at each of these three locations at the end of each day during the week of the full moon when Whale Shark tours were conducted. Prior to the April survey, two volunteers and two FoN staff members were committed to conducting surveys at these locations, while a Turtle Inn divemaster volunteered to administer surveys to guests at the Turtle Inn dive shop.

The April survey generated very few surveys due to a number of factors that were reported by survey volunteers. Specifically, the survey was reported to be too lengthy, resulting in a refusal by many visitors to complete it. In addition, tours often returned later than anticipated, and passengers were often too tired to complete the survey. Finally, the survey effort was hampered by fewer volunteers than had originally committed their time, which resulted in fewer visitors being approached.

In response to the observations following the April survey, TNC and FoN made some adjustments to the survey itself and to the survey implementation process. The goals for improving the May survey plan included shortening the length of the survey, implementing a visitor registration process in order to collect demographic data on tourists, encouraging tour operators to return to shore earlier so that passengers were not too tired to complete surveys, and requesting that tour operators stress the importance of completing the survey to their guests.

The May survey plan took into consideration the recommendations and goals for improving the survey that were made following the April moon. The length of the survey was reduced from four to three pages. As in March, a FoN employee was stationed at the entrance to the Whale Shark Zone to approach visitors during their dive and snorkel tours. However, due to a low response rate from visitors approached on the water in March, the employee was instructed to approach boats representing other operators who were present at the site in addition to the

three tour operators originally targeted during the first survey month. In March, it proved impossible to maintain daily contact between the employee and FoN's office in Placencia via radio, and as an alternative he was instructed to keep a daily log of his survey experience. Once again, volunteers were stationed at tour operator docking locations in the evening to conduct surveys with visitors who had not been approached on the water. The survey plan also included visits to the Turtle Inn and Robert's Grove resorts following breakfast in order to approach guests around the resort grounds who had been on whale shark tours during previous days of their trips. In addition, posters were designed and hung in dive shops informing divers and snorkelers of the whale shark survey.

Considerable improvements were made during the May survey, resulting in a marked increase in the survey response rate, especially among visitors approached on the water. Efforts to approach boats that were not originally identified as those that conduct whale shark tours increased the response rate of visitors to GSSCMR greatly, indicating that there were considerably more operators advertising and conducting such tours than originally expected. On shore, a number of problems that were encountered during the April survey were perpetuated in May, including late return times by boats, a lack of coordination between FoN and tour operators with regard to return times and locations, limited staff to collect surveys, and a lack of communication about the length of the survey week.

Recommendations for the June survey that were generated following the May survey included greater coordination between FoN and dive shops and improved communication between FoN staff and volunteers. In addition, it was recommended again that tour operators be asked to inform their passengers that they would be approached to fill out a survey either during or immediately following their trip and to stress the importance of completing the survey. Also,

visits to resorts during the daytime hours and to dive shops when boats returned at night proved successful during May, and it was recommended that this approach be continued in June.

During the June survey, whale shark dive and snorkel tours were not approached at the Gladden Spit Marine Reserve due to a shortage of survey staff. Volunteers continued to approach visitors at resorts and dive shops, during the daytime and in the evening, respectively. The June survey effort produced a relatively small survey response rate, due mainly to the lack of staff to collect surveys. There were very few tours that actually went to the WSZ during June due to inclement weather and a lack of whale shark sightings. However, additional people to collect surveys would have enabled greater coverage to meet those few people who did go on tours.

2.4 *Survey Analysis Methods*

Following the administration of the visitor survey, data was entered into an excel spreadsheet. Survey analysis was divided into two parts, quantitative and qualitative analysis. Quantitative analysis consisted of statistical and economic analysis of the data, while qualitative analysis focused on analyzing visitor comments.

2.4.1 *Statistical and Economic Analysis Methods*

The Nature Conservancy contracted Kreg Lindberg of Oregon State University to conduct statistical and economic analysis of the survey data. Analysis focused on answering questions related to current and past trip characteristics of visitors; fee experience, awareness and price responsiveness; and demographic characteristics of visitors. Analysis was conducted using the software program Limdep (Lindberg).

2.4.2 *Methods for Analysis of Visitor Comments*

Question number seventeen of the visitor survey, which was the final question, was an open-ended question for which visitors could provide their opinions about their experience at the Whale Shark Zone. The question was phrased:

17. Finally, what can Friends of Nature do to enhance your dive experience at Gladden Spit?

The answers to this question were used to qualitatively analyze the impressions of visitors of their whale shark tourism experience, with the purpose of applying the results to the improvement of management of the Gladden Spit Marine Reserve and of the enhancement of tour operations.

The answers to question seventeen were first copied and pasted from the excel data spreadsheets into a word document. After reading through the comments once for context, the following research question was developed:

What were the most prevalent suggestions that visitors made for the enhancement of their experience at Gladden Spit?

The text was then read a second time to identify key themes and ideas that answered the research question. Based on these key themes, a coding system was developed to assist in the analysis of the data. The coding scheme associated with the research question was derived from the data and is shown in Figure 5. After the coding system was developed, colored markers were used to highlight text in the document containing the visitor comments that coordinated with particular codes. A combination of in vivo and interpretative coding was used to assign codes to text. In vivo coding allows the analyst to identify specific words in the text that literally represent the code. In contrast, interpretive coding permits the analyst to infer a meaning from

text that is essentially synonymous with a code, despite the lack of an explicitly stated word or phrase, as with in-vivo coding (Seale and Kelly). Similar visitor comments that were linked to particular codes were grouped together and the results were summarized in a table.

Code: Increase chances of viewing whale sharks
Code: Reduce crowding in the Whale Shark Zone
Code: Prevent harassment of whale sharks
Code: Provide thorough briefings prior to arriving at the Whale Shark Zone
Code: Keep the environment within the reserve clean
Code: Protect the resources within the reserve
Code: Relax regulations
Code: Enforce regulations more strictly
Code: Improve professionalism of tour operators
Code: Institute certification and experience standards for diving in the Whale Shark Zone
Code: Provide additional services and facilities within the reserve
Code: Improve customer service provided by tour operators
Code: Utilize alternative methods to find and view whale sharks
Code: Reduce the cost of whale shark tourism experiences

Figure 5. Coding Scheme Applied to Visitor Comments to Answer the Question, ‘What were the most prevalent suggestions that visitors made for the enhancement of their experience at Gladden Spit?’

2.5 *Methods for Evaluation of Management Effectiveness*

2.5.1 *Introduction to Management Effectiveness Evaluation*

Management effectiveness is defined as the “degree to which management actions are achieving the goals and objectives of a protected area” (Pomeroy et al.). Evaluation of management effectiveness involves a review of the results of actions to determine if those actions are producing results that are desired, allows for opportunities to learn from both positive and negative management experiences, and assists in understanding how and why management practices are being adapted (Pomeroy et al.). Adaptive management is the “cyclical process of systematically testing assumptions, generating learning by evaluating the results of such testing and further revising and improving management practices” (Pomeroy et al.). Adaptive

management can lead to improved management effectiveness and increased progress towards the achievement of goals and objectives (Pomeroy et al.).

A collaborative effort by NOAA, WWF and IUCN resulted in a guide to evaluating management effectiveness for MPAs. The guide outlines how to assess management effectiveness, but stresses that evaluation methods will vary from site to site. The process begins with determining whether an MPA meets the minimum requirements to conduct an evaluation of management effectiveness. If it is determined that it does indeed meet these minimum requirements, the guide then proceeds to the step of evaluating the goals and objectives of the MPA. The next step is to match relevant biophysical, socioeconomic and governance indicators to these goals and objectives. After indicators are selected, an evaluation plan must be developed, which includes assessing the resource needs for measuring selected indicators, determining who the audience is that will receive the evaluation results, identifying who should participate in the evaluation, and developing a timeline and work plan for the evaluation. After the plan is developed, it must be implemented. Conducting the evaluation incorporates the collection, management and analysis of data, followed by peer review of results. Finally, results should be shared with the target audience and used to adapt management strategies (Pomeroy et al.).

2.5.2 Evaluation of Management Effectiveness for the Gladden Spit Marine Reserve

Selected steps in the management effectiveness evaluation process were conducted. These include determining whether the Gladden Spit Marine Reserve meets the minimum requirements to conduct an evaluation of management effectiveness and evaluating the goals and objectives of the MPA. These steps were conducted by consulting the Gladden Spit and Silk Cayes Marine Reserve Management Plan. Indicators were then matched with the goals and

objectives stated in the Management Plan. The evaluation of the majority of the indicators is beyond the scope of this project. For those indicators for which evaluation was feasible, mainly governance indicators, results are presented here.

2.6 *Methods for Evaluation of the Sustainability of Whale Shark Tourism*

The success of whale shark tourism at the Gladden Spit Marine Reserve, and specifically the success of the tourism user fee program as a mechanism to generate revenue for the reserve, is dependent upon the sustainability of the management of the marine reserve and of the user fee program. The sustainability of the program in turn depends upon the characteristics of FoN as an organization and of the institutional conditions under which it operates. In an effort to evaluate the characteristics of both FoN and its institutional environment and structure, a checklist developed by Professor Francis Lethem of the Duke University Sanford Institute of Public Policy was applied (Appendix C).

3 RESULTS

3.1 *Statistical and Economic Analysis Results*

The visitor survey effort resulted in approximately 20% of visitors completing the survey (Lindberg). Table 1 shows the total number of visitors that visited the whale shark zone between March and June 2004, as well as the number among them who completed surveys.

Table 1. Number of Visitors to the Whale Shark Zone and Survey Participants in 2004 (Lindberg)

Month	Visitors	Completed Surveys
March	Approx. 30	13
April	415	44
May	569	150
June	Approx. 75	13
Total	Approx. 1,089	220

Due to the reduction in survey length from the April to the May survey as a result of visitor refusal to participate during the initial months of the 2004 whale shark season, some results apply only to the March/April survey and some only to the May/June survey. The high number of refusals to participate in the survey indicates that results should be interpreted with some caution, as they may be biased toward visitors that were more motivated to participate in surveys relative to other visitors that were less motivated to complete the surveys. The dominance of May/June visitors in the data set also suggests that results may more strongly reflect the characteristics of visitors during those months, rather than the months of March and April (Lindberg).

The majority of survey respondents live in the United States, followed by Belize, Canada, the United Kingdom, and Mexico. Among visitors who completed the survey, 63% were male and 37% were female. Most respondents were in their 20s or 30s and were very well educated; over a third had a graduate degree and most of the remaining had a bachelor's degree. Among March/April survey respondents, 21% of visitors had an income of US\$20,000 or less, while 12% had an income of \$140,000 or more. May/June visitors had higher incomes on average (Lindberg).

Results of the survey are based on the assumption that activities reported on visitor surveys reflected activity specifically in the Whale Shark Zone of the Gladden Spit Marine Reserve. Of those people who visited the whale shark zone during the 2004 season, 73% reported that they had only been diving, 20% had only been snorkeling, and 7% had been both diving and snorkeling (Lindberg).

March/April respondents reported considerable international diving experience, with 40% having taken more than 10 international trips involving diving and/or snorkeling. Half of

May/June respondents had already completed one dive in the Whale Shark Zone upon completion of the visitor survey, while the rest had more experience in the area (Lindberg).

March/April respondents reported that the average number of days they were staying in Belize was 10.5, with 6.2 of these days spent diving and/or snorkeling. The most common trip length was 10 days, followed by 7 days (Lindberg). Approximately two thirds of visitors during the months of April, May and June paid for their tours to Gladden Spit through a dive operator in Belize independent of a hotel or resort. However, another 23% did pay through a hotel or resort, and 11% paid for their tours in their country of origin (Lindberg).

During all four months of the whale shark season, most visitors rated their experience at Gladden Spit fairly highly. However, it is common for satisfaction ratings to be quite high for experiences such as whale shark tourism; in fact, many of the respondents gave low ratings, indicating that experience quality could be better. Weather or other factors outside management control may have affected visitors negatively, resulting in the low ratings. However, these factors are not definitively known (Lindberg).

Given that whale sharks are the main attraction in the Whale Shark Zone, one possible predictor of experience quality is whether whale sharks are seen. Survey results revealed that 61% of respondents saw whale sharks; whale sharks were seen by 50% of respondents in March, 55% in April, and 68% in May. Of those visitors who completed surveys in the month of June, nobody saw a whale shark. The majority of those visitors who reported seeing whale sharks in May/June only saw one. Overall, visitors saw 1.9 whale sharks on average (Lindberg).

The average satisfaction rating, on a scale of 1 to 10, for those visitors who did not see whale sharks was 6.55, as opposed to an average satisfaction rating of 7.81 for those visitors who

did see whale sharks. This difference is statistically significant based on a t-test with p-value of 0.05, concluding that seeing a whale shark did increase visitor satisfaction (Lindberg).

The level of crowding also impacts experience quality. March and April visitors were asked to express their perception of crowding at the WSZ on a scale of 1 through 9, with 1 being not crowded at all and 9 being extremely crowded. In May and June, visitors were also asked about their perception of crowdedness, but the scale was changed from a 9-point scale to a 10-point scale. Figure 6 shows that approximately 18 percent of March/April visitors perceived high levels of crowding within the Whale Shark Zone, although the majority of visitors reported only low to mid levels of crowding. May/June visitors generally reported less crowded conditions (Lindberg).

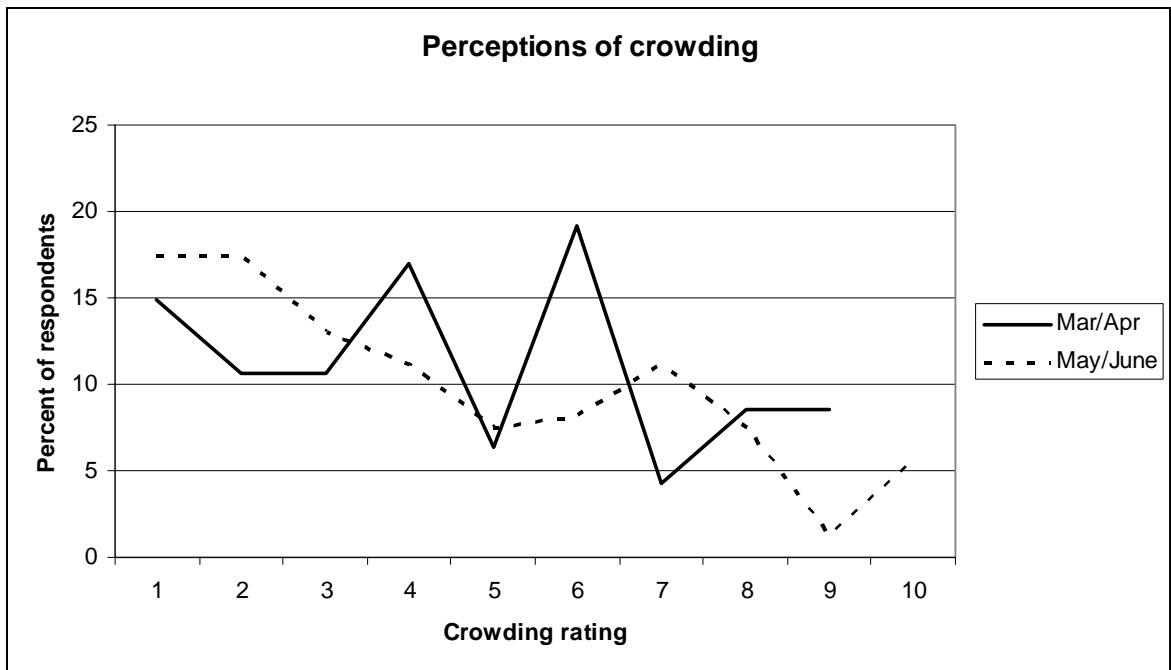


Figure 6. Visitor Perceptions of Crowding (Kreg Lindberg)

Table 2 summarizes the importance to visitors of various factors in determining whether they came to Gladden Spit. Importance was rated on a scale of 1 through 5, with 1 being the

least important consideration and 5 being the most important consideration. The presence of whale sharks received the highest average importance rating (Lindberg).

Relative to other destinations, Gladden Spit rates best on quality of the dive briefing, dive guide skill level, and presence of whale sharks. It rates better or about average on all items except overall trip cost and travel time from shore to dive site (Lindberg).

Table 2. Average Importance Rating of Factors in Considering a Visit to Gladden Spit (Lindberg, 2004)

Consideration	Average importance rating
Presence of whale sharks	4.6
Visibility / water quality	3.7
Overall trip cost (flight, lodging, operator fees, etc.)	3.1
Quantity of fish (density)	3.0
Diversity of fish species	2.9
Quality of dive site relative to the entrance fee cost	2.8
Travel time from shore to the dive site	2.5

Almost half of March/April visitors had paid fees at other dive and/or snorkel sites, either in Belize or in other locations. The average fee that was paid at other sites was \$6.60. The most common fee paid was \$5 per person per day, followed by \$10 (Lindberg).

Only a minority of visitors who completed the survey in all four months were aware of the \$15 per day entrance fee for the Whale Shark Zone prior to their arrival in Belize. However, awareness of the fee was considerably higher among May/June visitors than among March/April visitors (Lindberg).

All respondents completed a contingent behavior question. The actual fee to enter the Whale Shark Zone during the 2004 season was \$15; visitors were given a scenario involving a randomly assigned higher entrance fee of US\$30, \$50, \$75, or \$100 and asked whether they

would have changed their itinerary in response to the higher fee. Among respondents, 33% said they would have kept the same itinerary despite the fee increase, 29% said they would have canceled their entire trip, and 38% would have changed their itinerary. Therefore, respondents were more likely to change their itinerary as the fee increased. Respondents were also more likely to cancel their trip altogether as the fee increased (Lindberg).

Based on visitor responses to the contingent behavior question, it was estimated that the number of days spent at Gladden Spit decreases as the fee increases. A fee of \$30 would lead to a 22% decrease in visits to the site, a fee of \$50 would lead to a 44% decrease, and a fee of \$100 would lead to a 76% decrease. Price elasticity is estimated at -0.25 at a fee of \$15. Therefore, at \$15 a 10% increase in price would lead to a 2.5% decrease in visitation (Lindberg).

Approximately half of all visitors to Gladden Spit reported spending an average of 2.2 days diving and/or snorkeling at other sites in Belize. These other sites in Belize, as well as sites outside Belize, are complements to Gladden Spit. Therefore, a fee increase at Gladden Spit would not only decrease the number of days spent there, but would also potentially decrease the number of days spent at other dive sites in Belize and outside Belize (Lindberg).

The survey results indicated that there are a number of other variables that have an effect on the number of days spent diving and/or snorkeling at Gladden Spit. Not all survey respondents provided information on these variables, and some variables differed from the March/April survey to the May/June survey. However, these discrepancies were ignored during analysis in order to obtain the largest possible data set. Therefore, some inaccuracy occurs in the data and results should be interpreted with caution. Given these conditions, a number of variables were found to be statistically significant in determining visitation to Gladden Spit. Visitors who only snorkel tend to spend fewer days at Gladden than visitors who dive or engage

in both activities. Visitors from the US tend to spend more days than visitors from other countries. Visitors who perceive greater levels of crowding tend to spend more days than those who perceive less crowding, and those who are aware of the actual fee before arriving in Belize are less responsive to fee increases. Visitors with higher income are less responsive to fee increases, while visitors with higher education are more responsive to fee increases (Lindberg).

In addition to the contingent behavior question, survey respondents were asked an open-ended contingent valuation question. Specifically, they were asked to report the maximum fee per person per day that they would be willing to pay to visit the Whale Shark Zone. Responses ranged from \$3 to \$300 per person per day. The mean response was \$40, the median response was \$25, and the most common response was \$15. These results indicate that many visitors are willing to pay more than the \$15 entrance fee implemented in the 2004 whale shark season (Lindberg).

3.2 Results of Analysis of Visitor Comments

In answer to the question, ‘*What can Friends of Nature do to enhance your dive experience at Gladden Spit?*’ visitors provided a variety of responses. Thirteen respondents indicated that their experience in the Whale Shark Zone of Gladden Spit was a positive one. Such comments are exemplified by the statement from one tourist to “*Keep up the good work and protect the environment.*” Other respondents offered constructive suggestions to enhance visitor experiences within the reserve. These responses were coded using the coding scheme shown in Figure 1, which reflects the research question addressed in this portion of the analysis:

What were the most prevalent suggestions that visitors made for the enhancement of their experience at Gladden Spit?

Table 3 summarizes the results of the coding process, listing the most prevalent suggestions that visitors made for the enhancement of their experience at Gladden Spit. Comments exemplifying each category are also provided.

Of the 220 surveys that were completed, 123 visitors completed question number seventeen. The 56% response rate for this question may indicate that the people who took the time to answer it were more concerned with the conservation and sustainability of the resources associated with the Gladden Spit Marine Reserve, or that they were more personally invested in ensuring the quality of their dive and snorkel experiences, thereby imparting some bias into the data. The total number of comments in Table 3 does not add up to the 123 responses from visitors to this survey question. The difference represents visitors who expressed satisfaction with their trips and did not offer specific recommendations for improving their experience at Gladden Spit.

The frequency of the suggestions provided by visitors in answer to the survey question could serve as an indicator of the measure of importance of the suggestions and associated key ideas. Table 3 summarizes the various suggestions and provides the frequency with which they were mentioned in visitor comments. The suggestion to reduce crowding occurred most frequently, followed by the suggestion for improved informative briefings prior to tours to the Whale Shark Zone. The third most prevalent suggestion was to protect the resources within the reserve, followed by the suggestion to enforce regulations within the reserve. The next two most prevalent suggestions both related to improving opportunities to view whale sharks, and were followed by a suggestion to reduce the cost of the whale shark tourism experience.

Based on analysis of visitor comments, concerns about the price of whale shark tours are not nearly as prevalent as concerns about maintaining the quality of the actual whale shark

tourism experience, conservation of resources, regulation of the reserve, and opportunities to see the whale sharks. This could support the results of the statistical and economic analysis which showed that people may be willing to pay more money for the whale shark experience than the current fee.

Table 3. Summary of Visitor Suggestions to Enhance the Experience at Gladden Spit

Response	Number
Reduce crowding in the Whale Shark Zone <i>“There are too many boats and divers in the area.”</i>	25
Provide thorough briefings prior to arriving at the Whale Shark Zone <i>“Educate divers before they go diving (e.g., provide a video).”</i>	20
Protect the resources within the reserve <i>“Protect the whale sharks so people can see them in the future.”</i>	12
Enforce regulations more strictly <i>“Try to enforce the laws already in place as best as possible.”</i>	11
Increase chances of viewing whale sharks <i>“Make sure more whale sharks are around.”</i>	10
Utilize alternative methods to find and view whale sharks <i>“Maybe more communication between different dive boats when sharks are sighted (via a radio).”</i>	8
Reduce the cost of whale shark tourism experiences <i>“Don't charge me more for an already overpriced trip!”</i>	6
Improve customer service provided by tour operators <i>“Ensure dive operators ensure equipment is serviceable and that all prices are explicit in the information.”</i>	4
Prevent harassment of whale sharks <i>“We can't touch the whale shark which is good, but divers with cameras and videos hassle them and don't take care about other divers! Don't allowed cameras!”</i>	3
Relax regulations <i>“Make it easier to dive more often without restrictions.”</i>	3
Keep the environment within the reserve clean <i>“Keep all litter out of the water.”</i>	2
Institute certification and experience standards for diving in the Whale Shark Zone <i>“Ensure visiting divers have the necessary skills to dive safely at Gladden Spit!”</i>	2
Improve professionalism of tour operators <i>“A few of the rangers were not well-mannered with the group.”</i>	1
Provide additional services and facilities within the reserve <i>“I would like to stay overnight closer to Gladden Spit. A sailboat or a cabin on a nearby island.”</i>	1

3.3 Results of Evaluation of Management Effectiveness

The first step in evaluating the management effectiveness of the Gladden Spit and Silk Cayes Marine Reserve was to determine whether the protected area meets the minimum requirements to conduct such an evaluation. The Gladden Spit and Silk Cayes Marine Reserve does indeed meet these requirements. Specifically, it exists as a formal, legislated MPA; there is an ongoing management planning process; there is a written management plan including clearly stated goals and objectives; and it has been in operation for at least two years (Pomeroy et al.).

The next step in the process was to evaluate the goals and objectives of the MPA. This was accomplished by consulting the Gladden Spit and Silk Cayes Marine Reserve Management Plan. The goal of the Gladden Spit Marine Reserve is synonymous with the mission statement of Friends of Nature and is “to preserve and promote the sustainability of marine resources, islands, and cayes for our children and the country of Belize” (Friends of Nature, *Gladden Spit*). The objectives of the Gladden Spit Marine Reserve are outlined in the Management Plan and are:

- To manage resources of the Gladden Spit Marine Reserve with the help of all stakeholders.
- To manage Gladden Spit Marine Reserve on a scientific basis, relying on accurate monitoring for feedback control.
- To sustain both the dignity and livelihood of local fishermen.
- To provide and sustain a world-class recreational experience – safe and ecologically sound – that benefits local communities.
- To manage the spawning aggregations so that no species disappear and to replenish depleted stocks of some commercial species.

- To educate surrounding communities and others about marine ecosystems and the importance of sustaining them. (Friends of Nature, *Gladden Spit*)

The goals and objectives meet the criteria defined by Pomeroy et al. in their guidebook for evaluation of management effectiveness (2003). The goal for the Gladden Spit Marine Reserve is a broad statement of what the MPA is ultimately attempting to achieve. It is brief, clearly defines a long term vision, and is simple to understand. The objectives are more specific measurable statements of what must be achieved to meet that goal. They are easily understood, written in terms of what will be accomplished rather than how to go about accomplishing it, realistically achievable, and can be achieved by being measured and validated (Pomeroy et al.). The objectives are not, however, defined within a limited period of time.

Indicators were matched with the goals and objectives stated in the Management Plan. In order to evaluate the natural science management objectives for Gladden Spit Marine Reserve, the following biophysical indicators are appropriate:

- Focal species abundance
- Focal species population structure
- Habitat distribution and complexity
- Composition and structure of the community
- Recruitment success within the community
- Food web integrity
- Type, level and return on fishing effort
- Water quality
- Area showing signs of recovery
- Area under no or reduced human impact

Some of these indicators may only be applicable in particular areas of the Gladden Spit and Silk Cayes Marine Reserve. For example, using the indicator to assess whether an area is under no or reduced human impact would be especially pertinent in the conservation zone.

In order to evaluate the socioeconomic management objectives of the Gladden Spit Marine Reserve, the following indicators are applicable:

- Local marine resource use patterns
- Local values and beliefs about marine resources
- Level of understanding of human impacts on resources
- Changes in conditions of ancestral and historical sites/features/monuments
- Stakeholder knowledge of natural history
- Distribution of formal knowledge to communities
- Material style of life
- Household income distribution by source
- Community infrastructure and business
- Perceptions of non-market and non-use value

Finally, in order to evaluate the existing management goals and objectives, the following governance indicators are appropriate:

- Existence and activity level of community organizations
- Level of training provided to stakeholders in participation
- Level of stakeholder participation and satisfaction in management
- Availability and allocation of MPA administrative resources

Friends of Nature was founded through the efforts of members of the communities that

traditionally used the resources of Gladden Spit and who had an interest in conserving those resources. Community participation has been a keystone of the management plan development process for the Gladden Spit Marine Reserve, and stakeholders continue to be involved in many aspects of management activities. Therefore, the existence and activity level of community organizations is quite high. Similarly, the level of training provided to stakeholders in participation has been high. Level of stakeholder participation and satisfaction in management is generally high as well. MPA administrative resources are generally allocated efficiently when they are available. Due to a lack of resources and funding, some management areas suffer from shortages in the availability and allocation of administrative resources, most notably with regard to enforcement and monitoring.

3.4 Results of Evaluation of the Sustainability of Whale Shark Tourism

The following questions and answers were aimed at determining whether Friends of Nature can be characterized as a sound institution and whether whale shark tourism at Gladden Spit is a sustainable industry.

- Is there general agreement on FoN's legitimacy? Is FoN's purpose clearly stated?
YES. FoN is recognized as a legitimate institution by the Belizean government, by other organizations and by the communities that FoN represents. FoN is registered as a non-governmental organization with the Belizean government. Similarly, FoN's mission statement represents a clearly stated purpose of the institution.
- Is there a demand for FoN's products and services? Is FoN's purpose supported by key stakeholders?
YES & NO. There is generally a strong demand for the services provided by FoN. These services include managing tourism in the Gladden Spit and Silk Cayes Marine

Reserve, providing monitoring of the natural environment, patrolling the reserves and enforcing rules and regulations, providing community education and outreach, and managing fisheries in a sustainable manner. However, there are stakeholders who do not generate demand for the services provided by FoN. For example, some tour operators would prefer to conduct tours in an unregulated manner, with unlimited access to sites within Gladden Spit, and more specifically, within the Whale Shark Zone. FoN's purpose, declared in its mission statement, is supported by the majority of key stakeholders such as tour operators and fishermen.

- Does Belize have sound and equitable macro-economic policies, a predictable and efficient judiciary system, effective law enforcement, and freedom of information and of the press?

YES & NO. Belize has some sound and equitable macro-economic policies, but other policies are not sound. For example, Belize has a large trade deficit (World Bank). While the country has institutions to provide law and order, corruption and a lack of resources often means that law enforcement is not carried out. There is freedom of information and of the press in Belize.

- Are both the public and private sector institutions of Belize characterized by transparency and accountability?

YES & NO. FoN operates under high standards of transparency and accountability, engaging in community consultations to keep stakeholders well-informed. While FoN and its Board do not publish meeting minutes, they are available for the public to see if they request them (Interview with Lyndsay Garbutt). However, while FoN

maintains transparency and accountability, the public institutions of the government of Belize are not always transparent or accountable for their actions.

- Is FoN politically astute and able to find ways to make its enabling environment more supportive, including regarding its degree of managerial autonomy, and is FoN also capable of adapting to a changing environment – incl. at the international level?

YES. Belize is a small nation, and FoN's management staff has strong relationships with other NGOs and with the public institutions that they work with, most notably the Fisheries and Forestry Departments. Therefore, FoN is often able to use the networks that it is a part of to build a stronger and more supportive enabling environment. FoN has a great degree of managerial autonomy. The organization is young and has not had many opportunities to adapt to changing environments.

- Does FoN have committed leadership?

YES. FoN has strong, committed leadership with considerable professional experience and training and a stake in local community development and ensuring the sustainability of resources at Gladden.

- Is FoN's location appropriate?

YES. The FoN office is located in Placencia, where the majority of whale shark tour operators are located and where a fishing cooperative is also located.

- Does FoN have established sound structural and process linkages (i.e., appropriate to their relative power relationship) with their key stakeholders, incl. abroad (e.g., access to policy-making bodies; composition of their Board; contracts and partnership agreements; [interactive planning processes]; liaison mechanisms with other bodies; training arrangements; exchanges of information, etc.)?

YES. FoN has established some structural and process linkages with its key stakeholders that could be characterized as strong linkages. FoN's board is composed of members of the five local communities that have a stake in the resources of GSSCMR. FoN also has linkages to The Nature Conservancy, the World Wildlife Fund and other international NGOs, as well as the Belize Fisheries and Forestry Departments. These linkages provide access to policy-making bodies, are formalized through contractual agreements, and permit interactive planning processes, training opportunities and an exchange of information. For example, the government provides training regarding regulations, and FoN is responsible for making sure that its staff is present at the trainings. There are also community consultations and basic training that FoN conducts by hiring consultants (Interview with Shalini Cawich). The Belize Defense Force (BDF) does patrol Gladden occasionally. FoN is trying to build partnerships with BDF through the Ministry of Agriculture and Fisheries, with the assumption that it will be easier to facilitate partnerships in government to government relationships rather than directly through FoN via an NGO to government relationship (Interview with Lyndsay Garbutt).

- Is FoN able to obtain from its external environment all the resources it needs to achieve its purposes, incl. finances?

YES & NO. FoN is not always able to obtain all of the resources that it needs to achieve its purpose, goals and objectives from its external environment due to a lack of resources among other institutions and stakeholders that it has linkages with. Although FoN has been able to obtain many of the resources, including financial resources, that it needs to operate, many resources have been beyond its reach.

Specifically, the organization requires additional staff to patrol and provide enforcement of regulations.

- Has FoN (and/or its sponsors) devised institutional incentives (or mitigated institutional disincentives) as necessary to achievement of its objectives (e.g. clarity and feasibility of its mandate; appropriate time-horizon, competent ex-ante and ex-post evaluation of its policies and activities; establishment of meaningful rewards and penalties etc.)?

YES & NO. FoN has devised some institutional incentives to facilitate the achievement of its objectives, including establishing a clear and feasible mandate.

However, FoN has not established appropriate time-horizons, or any time horizons at all, for some of its objectives. Similarly, it has not developed a system to evaluate policies and activities at multiple stages. FoN conducts evaluations internally, and the Community Advisory Board meets every six weeks to conduct its own evaluations. FoN also attempts to hold staff meetings when possible, but it is difficult due to the fact that many staff members are located at the Cayes. Management holds staff meetings occasionally. Management evaluates staff, and the Board evaluates management (Interview with Shalini Cawich).

- Is FoN making use of economic incentives where they can substitute for administrative controls and regulations?

YES & NO. FoN is making use of some economic incentives where they can substitute for administrative controls and regulations. For example, there are fines for violating regulations, which vary depending on the type of violation. However, due

to a lack of resources, these economic incentives (or disincentives) are not always implemented.

- Is FoN able to balance both the demands of its higher authorities and the expectations of the entities subordinated to it?

YES & NO. FoN is sometimes able to balance both the demands of higher authorities and the expectations of subordinate entities. However, once again due to a lack of resources, FoN is often unable to satisfy all of the demands and expectations made of it.

- Is FoN's incentive system appropriate to its purposes and its staff's orientation?

YES. FoN's incentive system is appropriate to its purposes and to its staff's orientation. Like with many organizations, after a period of time, and pending evaluations, employees become eligible for raises (Interview with Shalini Cawich).

- Is FoN's structure, processes, and management style consistent with its strategy?

YES. FoN's structure, processes, and management style are consistent with its strategy.

- Did FoN's design process first ensure the institution's legitimacy by achieving a common vision of its purposes among its key stakeholders and the neutrality of its potential opponents?

YES. The design process first ensured FoN's legitimacy by achieving a common vision of its purposes among tour operators, fishermen from local communities, and other key stakeholders, and by achieving the neutrality of its potential opponents.

- Were FoN’s boundaries negotiated with its key stakeholders and were appropriate coordination mechanisms designed with the external entities indispensable for its success?

YES. FoN’s boundaries were established in consultation with the five FoN communities. The Belizean government does not really impose boundaries on FoN; rather NGOs and government tend to work together (Interview with Shalini Cawich).

- Were appropriate internal arrangements designed, including the feedback mechanisms needed to permit monitoring and learning from experience?

YES. Feedback is provided through community consultations to management. FoN implements changes to the management plan through consultations with the Board, and changes are communicated to the staff.

4 DISCUSSION

4.1 *Whale Shark Tourism*

Analysis of the visitor survey data suggests that the fee assessed to visit the Whale Shark Zone could be set higher and a considerable number of visitors would be willing to pay it. Results of the contingent behavior survey question showed that a fee increase from \$15 to \$30 would lead to a 22% decrease in visits to the Whale Shark Zone. While a higher fee could potentially lead to a decrease in the number of visitors, this would mean fewer visitors crowding the Whale Shark Zone and less of an impact on the whale sharks and the environment. Also, while a fee of \$30 per day would result in a reduction in the number of visitors from 1,089 to 849, it would also lead to an increase in revenue from \$16,335 at the \$15 fee level to \$25,470.

The contingent behavior approach is more similar to an actual fee “market” than the contingent valuation scenario in that it asks people to respond to a given fee rather than to

identify their maximum willingness to pay. Therefore, the results of the contingent behavior analysis are recommended as the preferred basis for making fee policy decisions (Lindberg 2004). The results of the contingent behavior and contingent valuation questions are completely independent of one another, and in no way inform the other. However, the results of the contingent valuation analysis, which revealed that survey respondents would be willing to pay an average of \$40 to visit the Whale Shark Zone, is useful in that it substantiates the argument that the fee could be higher without negatively impacting visitation to Gladden Spit.

However, while a higher fee would have the benefit of generating more revenue for management and potentially reducing impacts on the reserve, many tour operators are concerned that a decrease in visitors associated with an increase in fees would result in reduced profits for their dive tourism businesses. These concerns were expressed during 2004 meetings between FoN and tour guides and operators to revise the guidelines for whale shark tourism at Gladden Spit. There was agreement that the Whale Shark Zone had experienced overcrowding during the 2004 whale shark season and that actions needed to be taken to remedy this. However, the results of the guideline revisions are not radically different from the original version of the guidelines. Instead of six boats allowed in the whale shark zone, a smaller area defined by buoys will permit only 4 boats, with a total of six still permitted in the entire zone (Placencia Breeze).

The amount of time that a boat is permitted to remain inside the whale shark zone was reduced from two hours to one and a half hours. However, boats are allowed to remain in the zone until 5 p.m. Tour operators and tourists prefer to remain as late as possible in the area to be present when the snapper begin to feed at dusk and when there is a greater likelihood of seeing a whale shark. However, at this time there is also a greater chance of disturbing the whale sharks and the snapper. A lottery system will be implemented to assure fair and equal opportunity to all

operators for the favored, evening time slot. It was also determined that boat captains will be required to take the whale shark tourism course offered by FoN. All boats must register with Friends of Nature, but there will be no registration fee in 2005. By not requiring a boat registration fee, FoN is forgoing an opportunity to generate additional revenue that could be used to meet their financial requirements. Only one boat per operator will be allowed in the buoyed area during each time slot, unless there is a vacancy.

The maximum number of tourists allowed per boat will remain at 12 in 2005. Finally, stakeholders decided that the entrance fee will remain at US\$15 per person and will include use of the Silk Cayes during 2005. This decision reflects the concern on the part of tour operators that raising the fee will reduce the number of visitors. However, the results of the survey analysis show that visitor levels will not be substantially affected by an increase in fees. In addition, by incorporating a visit to the Silk Cayes and the Whale Shark Zone into one fee, FoN is losing potential revenue that could be gained by charging the standard fee of \$10 for Gladden Spit overall, which would include the Silk Cayes, and an additional sum to visit the Whale Shark Zone.

Analysis of visitor comments led to a number of conclusions. First, there are many people who visited the Whale Shark Zone during the 2004 season who thoroughly enjoyed their trips and did not have any suggestions for FoN to enhance their experience. However, many people were frustrated by the lack of whale sharks. The sentiment that divers and snorkelers perceived the zone to be overcrowded was revealed emphatically. There was also a strong desire to receive more educational and informative briefings prior to arriving at Gladden Spit. People want to see that regulations and rules are strongly enforced and that there is consistency among

tour operators and marine reserve personnel with regard to understanding of regulations. People also expressed their concern about the protection of the marine resources within the reserve.

There are a number of specific policy alternatives that could be considered which would reflect the perspectives of visitors. One option would be to not permit any divers and snorkelers in the water with the whale sharks. Comments from visitors, managers and scientists alike have indicated that the presence of people in the water with the whale sharks has contributed to a decrease in the number of whale sharks seen within the zone. However, the communities that benefit economically from the dive tourism industry would not be supportive of eliminating the very lucrative niche market for whale shark diving and snorkeling.

In lieu of completely eliminating opportunities to dive or snorkel with whale sharks, other policy alternatives could include permitting only snorkeling, as diving allows people to descend deeper in the water column where they have greater access to, and greater opportunities to harass, the whale sharks. Similarly, another policy alternative could be one that permits only one entry into the water in the whale shark zone per visitor. When whale shark regulations were originally created, managers and policy makers calculated the carrying capacity for the whale shark zone under the assumption that divers and snorkelers would only enter the water once. The carrying capacity is intended to minimize the impact on the whale sharks and the physical environment. However, these carrying capacities were established without the awareness that dive shops typically offer two-tank dive trips, and whale shark dive trips were no exception. Therefore, the total number of individual entries into the whale shark zone was actually double the number that had originally been anticipated by managers and policy makers. A policy to limit the number of entries into the water per individual would be consistent with the carrying capacities that were originally established. However, upon analysis of scientific data related to

the whale sharks, these carrying capacities may need to be adjusted to further reduce human impact on the whale sharks.

Another policy alternative to eliminate impacts on the whale sharks and their environment could include implementing a minimum diving certification level for visitors to the whale shark zone. The zone is not a forgiving dive location; it is situated beyond the protection of the reef where the water conditions are rough, the depth drops to over 2000 feet, and the snapper spawning aggregations that attract the whale sharks also draw large, relatively aggressive sharks that come to feed. It is imperative that divers are experienced and are able to maintain good buoyancy and control to remain at a distance from the sharks and fish and at a safe depth. A policy initiative to promote the development of additional tourism opportunities to take pressure off of the WSZ is another alternative to continuing to focus largely on the whale shark dive tourism industry. This has been initiated, but additional alternatives need to be developed, and more importantly, promoted.

Currently, regulations pertaining to the interaction of tourists with whale sharks exist. The management plan for GSSCMR also details the penalties for violating these regulations. However, there is no monitoring mechanism to observe the interactions between people and the whale sharks. If violations of the regulations occur, it is unlikely that they will be reported because enforcement resources are too limited to have rangers in the water with tourists and tour operators observing their behavior, and if tour operators and dive masters report violations there is no way to substantiate their reports. Therefore, a policy alternative that would require the development of a monitoring mechanism would greatly benefit the enforcement of whale shark regulations.

4.2 Management

The Management Plan for the Gladden Spit and Silk Cayes Marine Reserve is quite comprehensive. One aspect that is lacking is a focus on governance in the objectives of the plan. For example, while in practice there has traditionally been a high level of community participation in the management and decision-making process regarding Gladden Spit, there are not sufficient goals outlined in the plan with regard to community participation. Similarly, there is a lack of defined timelines for the achievement of objectives throughout the Management Plan.

An overwhelming obstacle to the effective management of the GSSCMR is the lack of enforcement resources to stop illegal fishing practices, primarily from neighboring countries. A policy that would serve as an alternative to the current approach to enforcement could involve closer collaboration between Friends of Nature rangers, who provide enforcement within the reserve, the Department of Fisheries and the Belize Defense Force. Similarly, enforcement efforts must also be extended to focus on the activities of researchers, who are bound by regulations that require them to provide scientific data to improve the management of the reserve in exchange for permits to conduct research, but who do not always do so.

4.3 Sustainability

Friends of Nature and of the Whale Shark Tourism industry in particular are both well on their way to being sustainable. Friends of Nature possesses many characteristics of a sound institution to varying degrees. However, there are many characteristics of a sound institution that FoN only partially possesses.

Friends of Nature, in cooperation with the Belizean Government, other regional NGOs, local stakeholders, and The Nature Conservancy, is making significant strides towards its goals of developing a comprehensive eco-tourism program for the Gladden Spit Marine Reserve, all

the while considering the priorities of conservation and sustainability of marine and coastal resources. However, despite the best efforts to design a sound eco-tourism management plan, there are limits imposed on the organization by a lack of resources. Additionally, efforts to implement and enforce management policies for the marine reserve are undercut by the lack of widespread understanding among all stakeholders of the connection between sustainable use of environmental resources and economic benefits.

In addition to promoting greater horizontal integration of Belizean agencies to improve enforcement capabilities with regard to illegal fishing activities, another potential policy alternative is to dedicate greater resources towards regional international cooperation. A primarily unilateral approach to dealing with the problem of illegal fishing is not proving to be sufficient to reduce the negative impacts of over fishing. TRIGOH and the Mesoamerican Barrier Reef System Initiative between Belize, Mexico, Guatemala and Honduras both aim to promote greater regional cooperation. However, border conflicts between Guatemala and Belize limit the opportunities for cooperation. Despite this obstacle, the potential benefits of engaging in regional cooperation over resources that are linked ecologically warrant greater investment in regional initiatives.

In addition to regional policy initiatives, another area that requires increased dedication of resources is the improvement of governance within Belize. Belize suffers from considerable corruption, a relative lack of transparency and accountability, and a significant lack of funding and resources. The lack of strong governance affects the ability of Friends of Nature to effectively manage the GSSCMR. For example, although Friends of Nature oversees the daily management operations of the reserve, the Department of Fisheries has the authority to prosecute individuals who violate marine reserve regulations. When a marine reserve ranger makes an

arrest for a violation of a regulation, the arrestee must be prosecuted by a Fisheries prosecuting officer. Friends of Nature directors reported that in nearly all cases, they have had to transport arrestees in their personal vehicles from Placencia to another town where the nearest jail is located because a Fisheries officer is not typically available to transport arrestees, despite the fact that it is the responsibility of Fisheries Department personnel to do so.

Prosecution must occur in the regional court that is located in yet another town, and a Fisheries Department prosecuting officer must travel from Belize City or the capitol of Belmopan to this regional court, which is a three hours drive. Limited personnel and financial resources often prohibit a prosecuting officer from traveling to the regional court within a timeframe of two days, which is the maximum length of time under Belizean law that an arrestee may be detained if not prosecuted. Therefore, arrestees often go free and are not prosecuted for violating marine reserve regulations. Conversely, when prosecutions do occur in a timely manner, FoN wins cases, proving that the system does work and that regulations are upheld when resources are sufficient to enable prosecution.

FoN directors are not optimistic about the possibility that Belizean law could be changed to lengthen the amount of time that a person can be detained without being prosecuted, but an alternative would be to allocate resources to lobby for improved governance in the long term. The NGO community within Belize has a strong lobbying presence, and this could be facilitated by joining resources with other NGOs to establish the goal of improving governance as a priority. In the short term, a potential policy alternative to address inefficiencies in governance could be to create opportunities for contractors to fulfill the obligations of prosecuting officers and of security personnel who could transport arrestees. This could potentially overcome the obstacle of the lack of enforcement of fisheries regulations on the part of the Belizean

Department of Fisheries that has been cited as a key factor in not meeting the fisheries management goals of the Gladden Spit Marine Reserve Management Plan.

5 RECOMMENDATIONS

5.1 Recommendations for Whale Shark Tourism

Marine Reserve Management

Regulations

1. Severely limit the number of visitors to the Whale Shark Zone (WSZ)
 - a. To prevent overcrowding.
 - b. To prevent negative impacts on spawning aggregations.
 - c. To prevent whale sharks from being driven away.
2. Limit the number of boats per dive shop in the WSZ each day. Perhaps only allow one boat per shop per day, with a maximum number of visitors each.
3. Given that visitors and tour operators all want to enter the WSZ as late in the day as possible, stagger the entry of boats in the afternoon, providing a mechanism for allotting prime spots late in the afternoon to operators on a rotating basis.
4. Permit only one entry into the water in the WSZ per visitor, eliminating two-tank and two-snorkel trips.
5. Consider implementing a regulation that sets a minimum diving certification level as a standard for being able to dive the WSZ (e.g. Advanced Open Water).
6. Consider implementing a regulation that prohibits diving in the WSZ altogether, allowing only for snorkel trips.
7. Possibly implement a wrist-band requirement for visitors to Gladden and the WSZ, in order to better monitor people who have entered the reserve. There could be

different colored bands for various reserves and zones, which would be distributed when entrance fees are paid.

8. Enforce regulations regarding trash and littering inside the marine reserve.
9. Enforce all other existing regulations, especially related to interaction with the whale sharks.
10. Design an effective monitoring mechanism for observing the interactions between people and the whale sharks, as well as a mechanism for penalizing people who violate regulations.
11. Develop a presentation, or at least a visual aid in the form of a poster, showing tour operators explicitly how overcrowding in the water decreases people's desire to visit the WSZ and how limiting the number of divers and boats will ultimately benefit their businesses by both providing a higher-quality experience for divers and snorkelers and lessening the impact on the resources at the WSZ, and therefore not driving away spawning aggregations and whale sharks.

Education

1. Create a video about Gladden and the WSZ that could be provided to tour operators and shown prior to trips.
2. Develop literature (or use the existing Gladden brochures) to leave in hotel rooms throughout Placencia and at resorts.
3. Provide thorough educational materials and training to tour operators and hold regularly scheduled courses to update and refresh knowledge, especially with regard to regulations.

4. Maintain a website that provides regularly updated information about both Gladden and the WSZ. Provide weather and water conditions, as well as information about whale shark sightings. Explicitly state when whale sharks can be best seen so that tourists are not misled to believe that they will see the sharks when they are unlikely to.

Personnel Management

1. Encourage courteous, knowledgeable and helpful behavior by rangers and other marine reserve personnel.

Tour Operations

Trip Planning

1. Offer only one boat doing a one-tank/one-snorkel trip to the WSZ each day to limit the amount of time that visitors are in the water with spawning aggregations and whale sharks. To recover revenue lost from not running two boats daily to the WSZ, possibly run a two-tank reef diving trip early in the morning (leaving around seven a.m. and returning early afternoon, as many operators throughout the Caribbean do), and then run the one-tank/one-snorkel trip to the WSZ in the afternoon when visitors are more likely to see the whale sharks.
2. Promote other unique dive experiences to tourists, such as twilight and night dives and wreck dives. This could also help to take some of the pressure off of the WSZ.

Education

1. Provide very comprehensive briefings prior to visiting the WSZ, preferably before leaving the dive shop. Give people their money's worth in information, but DO NOT

PROMISE that they will see a whale shark! A briefing should include information on:

- a. What to expect during visits to the WSZ, water conditions, etc.
 - b. The biology of whale sharks and their environment.
 - c. The history of Gladden Spit and the WSZ in particular.
 - d. The rules and regulations that apply to both the reserve and the WSZ, as well as the resulting fines and penalties for not obeying the regulations.
 - e. How the marine park entrance fee is used.
2. In ADDITION (not in lieu of a thorough briefing), provide visitors with copies of the FoN brochure for the Gladden Spit and Silk Cayes Marine Reserve.

Customer Service

1. Encourage courteous, helpful, knowledgeable and professional behavior by staff.
2. Ensure quality and well-serviced equipment.
3. Provide a pleasant atmosphere on the trips, including smoke-free boats and adequate protection from the sun.

5.2 Recommendations for Improving the Overall Management of Gladden Spit and Silk Cayes Marine Reserve

FoN should conduct a complete evaluation of management effectiveness. Based on the initial assignment of indicators to the goals and objectives of the management plan, there is an absence of goals and objectives addressing governance issues. FoN should also clearly define timelines for completing objectives in the management plan and provide better clarification and dissemination of information on the rules and regulations for GSSCMR. This would provide greater legitimacy to both Friends of Nature as the primary managing entity and to the

Department of Fisheries as the authoritative entity. FoN, in cooperation with the Government of Belize, must also improve enforcement of regulations in both the near term and the long term. Enforcement must improve with regard not only to fishing activity, but also with regard to interaction with whale sharks and with regard to researchers.

Other Opportunities

Opportunities to engage the FoN communities in efforts that will promote both conservation of the environment and the growth of the ecotourism industry are limitless. These include:

1. Being vigilant about keeping Placencia and the other FoN communities clean from waste. Tourists prefer to travel to areas that are pristine, and maintaining a clean environment will draw visitors.
2. Limiting run-off of waste water into the lagoon and coastal waters. Water-borne pollutants degrade the marine and estuarine environment and deplete the resources that tourists are coming to see.
3. Developing and promoting additional tour opportunities that will take the pressure off of the reefs and the whale shark zone, but will still generate tourism profits. These could include:
 - a. Visits to the mangroves and the lagoon.
 - b. Sailing, snorkeling and kayaking that could all provide opportunities to see local resources with minimal impact.
 - c. “Living history” sailing trips that could be designed to give tourists a historically accurate account of the stories of explorers, pirates and the cultures of Belize.
 - d. Trips geared towards naturalists, such as birders.

- e. A handicrafts center/co-op that could be established as a tourist attraction, especially if there were workshops set up to provide demonstrations of craftwork.
4. Encourage the sale and use of products that will not harm the environment, including environmentally friendly sunscreens, soaps, and cleaning products. The tourism board could establish a subcommittee designated with the task of identifying and contacting potential product manufactures and distributors.

5.3 *Recommendations for Enhancing the Sustainability of Projects at Gladden Spit*

It is recommended that FoN and the Government of Belize improve efforts to work towards greater regional cooperation in the management of marine resources. This is an overwhelmingly daunting challenge, as it entails not only managing natural resources of neighboring countries that are ecologically linked, but also overcoming political, economic and cultural obstacles.

Despite the challenges that FoN faces in managing the GSSCMR, the organization has established itself as a strong force in the effort to promote environmental and economic sustainability. One of the most significant resources at the disposal of Friends of Nature is the support of local communities. Belize has a strong commitment to environmental conservation, and people recognize the importance of maintaining the integrity of the country's natural resources to their own socioeconomic wellbeing. The challenge is to direct policy in such a way that the use of natural resources for the purpose of economic development, including tourism, is a sustainable process.

To overcome these obstacles, it is recommended that Friends of Nature work more closely with the national government to expedite the passage of laws regulating tourism within

the marine reserves, in order to give reserve rangers the authority to regulate tourism operations. Similarly, increased cooperation between environmental organizations and law enforcement agencies could allow for interagency sharing of resources that would enable monitoring efforts within the reserve and reduce illegal activities. At the same time, transparency should be maintained to limit potential opportunities for corruption between agencies and stakeholders. Although Friends of Nature intends to obtain the necessary equipment for monitoring of the reserve at some point in the future, the procurement mechanism for securing this equipment is not specified. It is recommended that a mechanism be identified and that administrative processes be standardized to enable not only efficient procurement, but also smooth operations within and between organizations.

6 CONCLUSION

The success and sustainability of future eco-tourism efforts for the Gladden Spit Marine Reserve, and throughout Belize, require the continued dedication and support of the national government, as well as increasing efforts to expand opportunities for participation at all levels. Local stakeholders, particularly those affected by impacts to the fisheries resources, whether through over-fishing or through restricted access to marine reserves, will play an integral role in determining the success of environmental sustainability in coastal Belize. It is therefore necessary to continue to include all potential stakeholders in the management planning process and to instill in them a sense of ownership of their local resources in order to ensure sustainable use of those resources.

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APPENDIX A
2004 WHALE SHARK SURVEY

Interviewer use only

Date _____ Interviewer _____ Survey No. _____ Version May CB-30A

Self completed _____ OR Administered by interviewer _____ Location _____ Operator _____

Gladden Spit Whale Shark Diver Survey

Conducted by



Friends of Nature



This survey is **voluntary**, **anonymous**, and completely **confidential**. Please answer all of the questions. If

anything is unclear, please ask the interviewer who gave you the survey. Thank you for your participation!

1. Did you go SCUBA diving or snorkeling in the whale shark zone? Please circle one number.

- 1. SCUBA
- 2. Snorkeling
- 3. Both

2. How many SCUBA dives or times snorkeling have you completed so far in the whale shark zone during this trip? By “trip,” we mean the period from when you left your home (usual place of residence) to when you will return home.

_____ Number of SCUBA dives or times snorkeling in the whale shark zone so far

3. How did you pay for your SCUBA or snorkeling tour to *Gladden Spit*?

- 1. Through a hotel or resort in Belize.
- 2. Through a dive operator in Belize independent of a hotel or resort.
- 3. In my country of origin with the following tour company: _____

4. How did you hear about the whale sharks at *Gladden Spit*?

5. On a scale of 1 to 10, with 10 being a perfect trip, how would you rate the overall quality of your experience at *Gladden Spit* during this trip?

Rate 1 – 10 (10 being best) _____

6. Did you see whale sharks during this trip?

- 1. No
- 2. Yes → *About how many?* _____

7. Did you feel crowded by other divers or snorkelers during your dives at *Gladden Spit*? Please circle the number that best reflects the extent to which you felt crowded.

1 2 3 4 5 6 7 8 9 10

Not at all
Crowded

Somewhat
Crowded

Moderately
Crowded

Extremely
Crowded

Lastly we would like to learn more about the characteristics of people who visit Gladden Spit. All responses are confidential. We will not ask your name or anything else to identify you.

12. Where do you live? Please circle the appropriate number.

1. Belize
2. United States → *What state?* ____
3. Canada
4. Another country → *What country?* _____

13. What is your gender?

1. Female
2. Male

14. What is your age?

1. Under 18 years
2. 18 - 29 years
3. 30 - 39 years
4. 40 - 49 years
5. 50 - 59 years
6. 60 years or over

15. What is your highest level of completed education?

1. Primary school
2. High school (diploma)
3. Undergraduate college/university (e.g., Bachelors)
4. Graduate (e.g., Masters or Ph.D.)

16. What is your pre-tax income per year *from all sources*?

1. Less than US\$20,000
2. US\$20,000 to US\$39,999
3. US\$40,000 to US\$69,999
4. US\$70,000 to US\$99,999
5. US\$100,000 to US\$149,999
6. US\$150,000 or above

(If you do NOT know your income in US\$ dollars, please write the name of the currency and the amount in the following spaces.)

Other currency name: _____ Annual amount: _____

17. Finally, what can Friends of Nature do to enhance your dive experience at Gladden Spit?

When you are finished, please hand the survey back to the interviewer. Thank you for completing this survey!

Note: Insert the 2nd page of the survey which is different for each of the 8 version. Each of the different pages is included with this document.

You can use the same covers as last time which show the different version numbers of the survey. If you need to print new covers, just change the version number and re-print the covers.

<i>CB-30A</i>	<i>US\$30 with <u>shorter</u> language for #15</i>
<i>CB-30B</i>	<i>US\$30 with <u>longer</u> language for #15</i>
<i>CB-50A</i>	<i>US\$50 with <u>shorter</u> language for #15</i>
<i>CB-50B</i>	<i>US\$50 with <u>longer</u> language for #15</i>
<i>CB-75A</i>	<i>US\$75 with <u>shorter</u> language for #15</i>
<i>CB-75B</i>	<i>US\$75 with <u>longer</u> language for #15</i>
<i>CB-100A</i>	<i>US\$100 with <u>shorter</u> language for #15</i>
<i>CB-100B</i>	<i>US\$100 with <u>longer</u> language for #15</i>

8. In the following table, please write how many days in total during this trip you estimate you will spend diving or snorkeling at each of the following sites.

Dive Site	Days Diving or Snorkeling
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

9. Gladden Spit Marine Reserve is co-managed by Friends of Nature, a Belizean non-governmental organization (NGO), and the Department of Fisheries. To improve visitor facilities and manage the impacts of tourism in the reserve, Friends of Nature recently started charging an entrance fee of US\$15 per person per day.

When did you first become aware that you would need to pay an entry fee at Gladden Spit?

1. Before I arrived in Belize.
2. After I arrived in Belize.

10. Friends of Nature may decide to charge a higher fee to help cover the cost of better facilities and increased protection.

If the entrance fee at Gladden Spit had been US\$30 per person per day instead of US\$15 per person per day, what would you have done? Please circle the appropriate number.

1. I would have gone diving *the same number* of days I did before (as shown in #8).
2. I would have *cancelled* the whole trip.
3. I would have *changed the number* of days at Gladden Spit and/or other dive areas to the number of days as follows:

Dive Site	Days Diving or Snorkeling Had the Gladden Spit Entry Fee Been US\$30
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

11. What is the maximum fee, per person per day, you would be willing to pay to dive or snorkel at Gladden Spit during whale shark season – before you would decide not to visit the site?

US\$ _____ per person per day

8. In the following table, please write how many days in total during this trip you estimate you will spend diving or snorkeling at each of the following sites.

Dive Site	Days Diving or Snorkeling
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

9. Gladden Spit Marine Reserve is co-managed by Friends of Nature, a Belizean non-governmental organization (NGO), and the Department of Fisheries. To improve visitor facilities and manage the impacts of tourism in the reserve, Friends of Nature recently started charging an entrance fee of US\$15 per person per day.

When did you first become aware that you would need to pay an entry fee at Gladden Spit?

1. Before I arrived in Belize.
2. After I arrived in Belize.

10. Friends of Nature may decide to charge a higher fee to help cover the cost of better facilities and increased protection. *Revenue will also fund patrols that reduce illegal fishing and thereby maintain the fish spawning aggregation and presence of Whale Sharks.*

If the entrance fee at Gladden Spit had been US\$30 per person per day instead of US\$15 per person per day, what would you have done? Please circle the appropriate number.

1. I would have gone diving *the same number* of days I did before (as shown in #8).
2. I would have *cancel*ed the whole trip.
3. I would have *changed the number* of days at Gladden Spit and/or other dive areas to the number of days as follows:

Dive Site	Days Diving or Snorkeling Had the Gladden Spit Entry Fee Been US\$30
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

11. What is the maximum fee, per person per day, you would be willing to pay to dive or snorkel at Gladden Spit during whale shark season – before you would decide not to visit the site?

US\$ _____ per person per day

8. In the following table, please write how many days in total during this trip you estimate you will spend diving or snorkeling at each of the following sites.

Dive Site	Days Diving or Snorkeling
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

9. Gladden Spit Marine Reserve is co-managed by Friends of Nature, a Belizean non-governmental organization (NGO), and the Department of Fisheries. To improve visitor facilities and manage the impacts of tourism in the reserve, Friends of Nature recently started charging an entrance fee of US\$15 per person per day.

When did you first become aware that you would need to pay an entry fee at Gladden Spit?

1. Before I arrived in Belize.
2. After I arrived in Belize.

10. Friends of Nature may decide to charge a higher fee to help cover the cost of better facilities and increased protection.

If the entrance fee at Gladden Spit had been US\$50 per person per day instead of US\$15 per person per day, what would you have done? Please circle the appropriate number.

1. I would have gone diving *the same number* of days I did before (as shown in #8).
2. I would have *cancel*ed the whole trip.
3. I would have *change*d the number of days at Gladden Spit and/or other dive areas to the number of days as follows:

Dive Site	Days Diving or Snorkeling Had the Gladden Spit Entry Fee Been US\$50
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

11. What is the maximum fee, per person per day, you would be willing to pay to dive or snorkel at Gladden Spit during whale shark season – before you would decide not to visit the site?

US\$ _____ per person per day

8. In the following table, please write how many days in total during this trip you estimate you will spend diving or snorkeling at each of the following sites.

Dive Site	Days Diving or Snorkeling
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

9. Gladden Spit Marine Reserve is co-managed by Friends of Nature, a Belizean non-governmental organization (NGO), and the Department of Fisheries. To improve visitor facilities and manage the impacts of tourism in the reserve, Friends of Nature recently started charging an entrance fee of US\$15 per person per day.

When did you first become aware that you would need to pay an entry fee at Gladden Spit?

1. Before I arrived in Belize.
2. After I arrived in Belize.

10. Friends of Nature may decide to charge a higher fee to help cover the cost of better facilities and increased protection. *Revenue will also fund patrols that reduce illegal fishing and thereby maintain the fish spawning aggregation and presence of Whale Sharks.*

If the entrance fee at Gladden Spit had been US\$50 per person per day instead of US\$15 per person per day, what would you have done? Please circle the appropriate number.

1. I would have gone diving *the same number* of days I did before (as shown in #8).
2. I would have *cancel*ed the whole trip.
3. I would have *changed the number* of days at Gladden Spit and/or other dive areas to the number of days as follows:

Dive Site	Days Diving or Snorkeling Had the Gladden Spit Entry Fee Been US\$50
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

11. What is the maximum fee, per person per day, you would be willing to pay to dive or snorkel at Gladden Spit during whale shark season – before you would decide not to visit the site?

US\$ _____ per person per day

8. In the following table, please write how many days in total during this trip you estimate you will spend diving or snorkeling at each of the following sites.

Dive Site	Days Diving or Snorkeling
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

9. Gladden Spit Marine Reserve is co-managed by Friends of Nature, a Belizean non-governmental organization (NGO), and the Department of Fisheries. To improve visitor facilities and manage the impacts of tourism in the reserve, Friends of Nature recently started charging an entrance fee of US\$15 per person per day.

When did you first become aware that you would need to pay an entry fee at Gladden Spit?

1. Before I arrived in Belize.
2. After I arrived in Belize.

10. Friends of Nature may decide to charge a higher fee to help cover the cost of better facilities and increased protection.

If the entrance fee at Gladden Spit had been US\$75 per person per day instead of US\$15 per person per day, what would you have done? Please circle the appropriate number.

1. I would have gone diving *the same number* of days I did before (as shown in #8).
2. I would have *cancel*ed the whole trip.
3. I would have *change*d the number of days at Gladden Spit and/or other dive areas to the number of days as follows:

Dive Site	Days Diving or Snorkeling Had the Gladden Spit Entry Fee Been US\$75
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

11. What is the maximum fee, per person per day, you would be willing to pay to dive or snorkel at Gladden Spit during whale shark season – before you would decide not to visit the site?

US\$ _____ per person per day

8. In the following table, please write how many days in total during this trip you estimate you will spend diving or snorkeling at each of the following sites.

Dive Site	Days Diving or Snorkeling
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

9. Gladden Spit Marine Reserve is co-managed by Friends of Nature, a Belizean non-governmental organization (NGO), and the Department of Fisheries. To improve visitor facilities and manage the impacts of tourism in the reserve, Friends of Nature recently started charging an entrance fee of US\$15 per person per day.

When did you first become aware that you would need to pay an entry fee at Gladden Spit?

1. Before I arrived in Belize.
2. After I arrived in Belize.

10. Friends of Nature may decide to charge a higher fee to help cover the cost of better facilities and increased protection. *Revenue will also fund patrols that reduce illegal fishing and thereby maintain the fish spawning aggregation and presence of Whale Sharks.*

If the entrance fee at Gladden Spit had been US\$75 per person per day instead of US\$15 per person per day, what would you have done? Please circle the appropriate number.

1. I would have gone diving *the same number* of days I did before (as shown in #8).
2. I would have *cancel*ed the whole trip.
3. I would have *changed the number* of days at Gladden Spit and/or other dive areas to the number of days as follows:

Dive Site	Days Diving or Snorkeling Had the Gladden Spit Entry Fee Been US\$75
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

11. What is the maximum fee, per person per day, you would be willing to pay to dive or snorkel at Gladden Spit during whale shark season – before you would decide not to visit the site?

US\$ _____ per person per day

8. In the following table, please write how many days in total during this trip you estimate you will spend diving or snorkeling at each of the following sites.

Dive Site	Days Diving or Snorkeling
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

9. Gladden Spit Marine Reserve is co-managed by Friends of Nature, a Belizean non-governmental organization (NGO), and the Department of Fisheries. To improve visitor facilities and manage the impacts of tourism in the reserve, Friends of Nature recently started charging an entrance fee of US\$15 per person per day.

When did you first become aware that you would need to pay an entry fee at Gladden Spit?

1. Before I arrived in Belize.
2. After I arrived in Belize.

10. Friends of Nature may decide to charge a higher fee to help cover the cost of better facilities and increased protection.

If the entrance fee at Gladden Spit had been US\$100 per person per day instead of US\$15 per person per day, what would you have done? Please circle the appropriate number.

1. I would have gone diving *the same number* of days I did before (as shown in #8).
2. I would have *cancel*ed the whole trip.
3. I would have *change*d the number of days at Gladden Spit and/or other dive areas to the number of days as follows:

Dive Site	Days Diving or Snorkeling Had the Gladden Spit Entry Fee Been US\$100
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

11. What is the maximum fee, per person per day, you would be willing to pay to dive or snorkel at Gladden Spit during whale shark season – before you would decide not to visit the site?

US\$ _____ per person per day

8. In the following table, please write how many days in total during this trip you estimate you will spend diving or snorkeling at each of the following sites.

Dive Site	Days Diving or Snorkeling
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

9. Gladden Spit Marine Reserve is co-managed by Friends of Nature, a Belizean non-governmental organization (NGO), and the Department of Fisheries. To improve visitor facilities and manage the impacts of tourism in the reserve, Friends of Nature recently started charging an entrance fee of US\$15 per person per day.

When did you first become aware that you would need to pay an entry fee at Gladden Spit?

1. Before I arrived in Belize.
2. After I arrived in Belize.

10. Friends of Nature may decide to charge a higher fee to help cover the cost of better facilities and increased protection. *Revenue will also fund patrols that reduce illegal fishing and thereby maintain the fish spawning aggregation and presence of Whale Sharks.*

If the entrance fee at Gladden Spit had been US\$100 per person per day instead of US\$15 per person per day, what would you have done? Please circle the appropriate number.

1. I would have gone diving *the same number* of days I did before (as shown in #8).
2. I would have *cancel*ed the whole trip.
3. I would have *changed the number* of days at Gladden Spit and/or other dive areas to the number of days as follows:

Dive Site	Days Diving or Snorkeling Had the Gladden Spit Entry Fee Been US\$100
a. Gladden Spit	
b. All other dive sites in Belize	
c. Dive sites outside Belize	

11. What is the maximum fee, per person per day, you would be willing to pay to dive or snorkel at Gladden Spit during whale shark season – before you would decide not to visit the site?

US\$ _____ per person per day

APPENDIX B

LIST OF DIVE TOUR OPERATORS

TOUR OPERATOR	LUNCH SIGHTS	DOCKING Time/Place	Dive/ Snorkel	PRICE	SUGGESTED SURVEY
				Incl Equip	TIME/SIGHT
Ocean Motion	Silk Caye	In front	Snkl	\$69 US	End of Day
Bernard		Approx 4:30			
Sea Horse	Behind Reef	In front	Dv	\$163 US	End of Day
Brian Young		6:30-7:00	Snkl		
Natural Mystic	Dpnds on wnd, mstly	In front	Dv	\$81 US	End of Day
Patty Ramirez	Behind Reef	Approx 7:00	Snkl	\$54 US	
Advanced	Behind Reef	On beach or behind	Dv	\$150 US	End of Day
Lance		Jngl J	Snkl	\$65 US	
Joy Tours		Behind shp on lgn	Snkl		End of Day
Dwain					
Nite Wind	Silk Caye	In front	Snkl	\$50 US	End of Day
Donna					
South Belize Jngl+rf	Behind Reef	By office on lgn	Dv	\$145 US	End of Day
Arthur Westby			Snkl	\$55 US	
Splash	Dpnds, mstly	In front	Dv	\$81 US	End of Day
James	Behind Reef	Approx 7:00	Snkl	\$54 US	
Hamanasi			Dv		At lunch on Reef
Karin					
Nautical Inn			Dv		At lunch on Reef
Edd Carr			Snkl		
Turtle Inn			Dv		At lunch on Reef
Julie Berry			Snkl		or at Inn (Julie Berry)
Robert's Grove			Dv		At lunch on Reef
Bradley			Snkl		

(The Nature Conservancy and Friends of Nature)

APPENDIX C

FRANCIS LETHEM'S LIST OF CHARACTERISTICS OF SOUND INSTITUTIONS

Francis Lethem's List of Characteristics of Sound Institutions

A. Sound, sustainable institutions have a favorable, supportive policy & institutional environment :

- there is general agreement on their **legitimacy** and that of their **clearly stated purposes**;
- there is a **demand** for their products/ services; their purposes are supported by key stakeholders
- the **country** has sound and equitable macro-economic **policies**; it enjoys **law and order** (it has a predictable and efficient judiciary system and enforces its laws); and it allows **freedom of information** and of the press;
- **transparency and accountability** is required from public and private/ NGO sector institutions;
- they are **politically astute** and able to find ways to make their enabling environment more supportive, including regarding their degree of managerial **autonomy**, and they are also **capable of adapting** to a changing environment – incl. at the international level;
- they have committed **leadership**.

I. Their relationships with their external institutional environment are appropriate:

- their institutional **location** is sound;
- they have established sound structural and process **linkages** (i.e., appropriate to their relative power relationship) with their key stakeholders, incl. abroad (e.g., access to policy-making bodies; composition of their Board; contracts and partnership agreements; [interactive planning processes]; liaison mechanisms with other bodies; training arrangements; exchanges of information, etc.); hence,
- they are able to **obtain** from their external environment all the **resources** they need to achieve their purposes, incl. finance;
- they (and/or their sponsors) have devised institutional **incentives** (or mitigated institutional disincentives) as necessary to achievement of their objectives (e.g. clarity and feasibility of their mandate; appropriate time-horizon, competent ex-ante and ex-post evaluation of their policies and activities; establishment of meaningful rewards and penalties etc.);
- they are making use of **economic incentives** where these can substitute for administrative controls and regulations;
- they are able to **balance** both the **demands** of their higher authorities and the expectations of the entities subordinated to them.

C. Their internal institutional structures, processes, incentives and their staff are sound:

- Their **incentive system** is appropriate to their purposes and their staff's orientation
- Their structure, processes, and management style are consistent with their strategy, etc.

P. They are the product of a **sound institutional design and re-design methodology** [providing for periodic re-assessments to ensure that, overtime, they will remain sound²]:

A. The design process first ensured the institution's legitimacy by achieving a **common vision** of its purposes among its key stakeholders and the neutrality of its potential opponents;

I. The organization's **boundaries** were negotiated with its key stakeholders and appropriate coordination mechanisms were designed with the external entities indispensable for its success;

C. And only then were appropriate internal arrangements designed, including the feedback mechanisms needed to permit monitoring and learning from experience.

² E.g. in relation with their evolving environment and e.g. to avoid the loss of legitimacy now plaguing many of the international financial institutions as well as others such as the WTO.