

# ECOLOGICAL AND ECONOMIC SUSTAINABILITY OF TROPICAL REEF SYSTEMS: ESTABLISHING SUSTAINABLE TOURISM IN THE EXUMA CAYS, BAHAMAS

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**Abstract:** *The Bahamas is a physically unique country quite unlike any other in the Caribbean; the archipelago is made up of hundreds of islands stretching over 1000 kilometers, with over 30 inhabited islands. The country is subdivided into island groups, but the most populated island and location of the capital, Nassau, is in New Providence. The Bahamas represents one of the most popular tourist destination in the wider Caribbean and entertains two tourism markets: 1) cruise ship and resort (overnight) tourism focused on the cities of Nassau and Freeport, and 2) out-island tourism that focuses on yachting, beach-going or fishing on the more remote islands. The Exuma Cays are located southeast of Nassau in the central Bahamas and are advertised as the "Sailing Capital of The Bahamas". Cruising yachts can pass through the Exumas en route to the wider Caribbean. This archipelago of low-lying islands is one of the most pristine and beautiful areas in the Bahamian island chain. The region offers numerous protected harbors and anchorages as well as one of the first marine fisheries reserves, the Exuma Cays Land and Sea Park. The very success of the Park as a "no-take" zone has attracted an increasing number of visiting yachtsmen to the Exumas. This yearly increase in visitor numbers has stimulated local businesses to provide services and build infrastructure according to expediency rather than a concern for long-term environmental impacts. Now that symptoms of ecological degradation and tourism impacts are becoming visible within the developed areas of The Bahamas, there is a tremendous need to direct Exuma tourism to that which will sustain rather than destroy the environment, the very product marketed and sought.*

*In order to gain accurate data on visitation patterns in the Exuma Cays and formulate recommendations for regional tourism monitoring and management, a visitor survey was conducted in Nassau, New Providence and throughout the Exuma island chain. Two methods were utilized to conduct the survey: 1) in-person interviews and 2) mail-out questionnaires. A total of 124 in-person and 560 mail-out questionnaires were completed over a one year period.*

*The survey questionnaire was divided into three sections in order to 1) characterize who visits the Exumas, 2) understand why they come, and 3) define what they are seeking. The data collected was then used to determine the impacts of tourism on the Park. For example, it was found that over half of Exuma tourists are first time visitors. Park management is faced with the task of educating these visitors as to the fishing restrictions and other regulations such as anchoring and garbage disposal. This requires time and staff support from a marine park that lacks specific plans and adequate financial backing. It is now important for the Park to create a clear management plan, a strategy for financing park activities in the future and new regulations to preserve the natural resources upon which both fishing stocks and visitation are dependent.*

**Keywords:** *parks and protected areas, recreation, ecotourism, conservation, environmental impacts, management planning*

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## Introduction

The prominence of tourism as the world's largest industry constitutes both a challenge and an opportunity, as it can either destroy

precious ecosystems and natural resources or contribute to their conservation and economic growth. Tourism facilities and services consume large quantities of land, water and energy as well as produce significant volumes of waste and effluent. The environmental impacts of tourism, especially mass tourism, are no longer local, but also directly contribute to global marine pollution, climate change, ozone depletion, and loss of biodiversity.

In tropical island systems such as the Caribbean, tourism is essentially a coastal industry. The majority of tourism facilities are sited within 800 meters of the high-water mark, in a zone that can be both unstable and vulnerable to geological and oceanographic phenomena. As a result, very little disturbance is required to destabilize such environments and lead to significant ecological degradation both above and below the water. Unmanaged tourism growth can destroy pristine terrestrial and marine resources, contaminate water supplies, place stress on waste treatment and disposal systems, and render areas unprotected from storms and ocean surges, thereby disrupting the unique features of islands that appeal to tourists.

At the same time the threats and poor status of tropical marine resources are being documented, there is a call for integrated coastal zone management from island nations and environmental organizations. Integrated coastal zone management aims to develop plans for sustainable use of coastal resources. The concepts of "sustainable development" and "sustainable resource use" embrace the notion that one *can* develop a way to use resources in ways that do not restrict the options of future generations to use the same resources.

Developing sustainable tourism in the tropics is especially difficult due to the fragile nature of island systems. Tourist numbers have increased faster than the infrastructure and technology have been put in place to treat pollutants, maintain energy supplies and provide adequate transportation. The

geology of tropical island systems also poses a problem for proper solid waste management and fresh water supplies. The Bahamian archipelago, for instance, is made up of a relatively young carbonate bank system dominated by lithogenic and biogenic production of calcium carbonate sediments. Because limestone dissolves in rainwater and leaves very little residue, the soils throughout The Bahamas are extremely thin and patchy (Sealey, 1990). The inability of the thin soil to hold water and the highly porous nature of the underlying limestone bedrock result in a lack of surface fresh water and a limited amount of ground water.

### **Sustainable Tourism: The Bahamas' Position**

The Bahamas is ahead of many countries in the wider Caribbean in its planning for sustainable development. The Ministry of Tourism has taken a leadership role and established a Sustainable Tourism/ Eco-tourism unit which has been given the mandate to drive the sustainable tourism effort for the industry. The Ministry of Tourism has also commissioned a comprehensive Sustainable Tourism Policy and Guidelines for the Out Islands of The Bahamas, the first of its kind in the region.

These policies have been initiated out of a recognition that the natural resources of The Bahamas are facing severe threats. Because of the archipelagic nature of the islands, development and the environment are both inter-related and interdependent; coastlines are fragile, and enforcement is extremely difficult. Over the past two decades, the tourism market of The Bahamas has undergone a dramatic period of expansion and change. Traditionally a destination that attracted a selected visitor base seeking serenity, the country was ill-prepared for the changing markets of the 1980's. This boom was spurred by a tremendous expansion in mass tourism vehicles, especially the cruise industry and the all-inclusive resort phenomenon.

Today, The Bahamas leads the Caribbean region in both number of tourists and tourism revenues. In 1995, The Bahamas received 3,238,255 visitors, and visitor expenditure accounted for a total of USD\$1.346 billion (Bahamas Ministry of Tourism, 1995). Visitor nights totaled 9,031,455. Tourism provides approximately 50% of The Bahamas GDP and employs directly or indirectly 40% of the work force (50,000 persons). Because of the island geography of the country, The Bahamas can protect and promote two tourism markets: the mass tourism market for resorts and cruise ships such as has been developed in Nassau, and the ecotourism market in the Out Islands (Sullivan Sealey, 1999). The “two market” phenomena in The Bahamas requires two types of infrastructure planning and development. Protecting the out-island experience and high environmental quality of the more remote island groups has been a priority for the Ministry of Tourism as well as local communities.

Coastal degradation in a relatively small area, such as New Providence, can provide “lessons learned” for the rest of the country, and particularly the Exumas Cays. To provide better planning and management for the fragile tourism markets of the Out Islands, the following questions were addressed via a socio-economic survey of visitors to the Central Bahamas:

- What is the nature of tourism in the Exumas?
- How is tourism influenced by the presence of a marine protected area such as the Exuma Cays Land and Sea Park?
- What issues need to be considered for sustainable tourism development?

### **The History of Bahamian Tourism**

Although the birth of tourism to The Bahamas occurred as early as 1851 when the Ba-

hamian government first planted the seeds of an ambitious program of promoting island visitation, it did not truly flourish until the end of World War II. Before the 1900’s, less than 500 tourists visited Nassau each winter. In 1914, the Bahamian government created a Development Board to increase tourism to the islands, but the outbreak of World War I and the prohibition era that followed greatly slowed the growth of the Bahamian tourism industry.

Following the Second World War, Bahamian tourism began to increase tremendously. This was primarily due to the improvement in air service, as a growing number of daily flights into Nassau brought waves of visitors from both Florida and Cuba. The Bahamas’ old world charm, cheap goods, warm waters and comfortable climate were no less important when it came to attracting tourists to the islands. By the mid-1960’s, Nassau was receiving 7,500 visitors a day and the Out Islands up to 4,000 (Pavlidis, 1997). The motivation for this new tourism movement came from the promotional advertising undertaken by the Development Board, which was to become The Bahamas Ministry of Tourism in January of 1964.

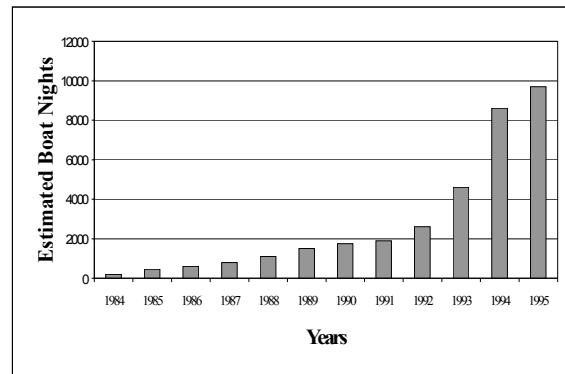
As The Bahamas became known as a year-round tourist destination, money poured into the country only to be invested as fast as it arrived. Both wealthy Bahamians and foreigners alike purchased property throughout the Out Islands to build permanent residences or vacation retreats. Even the Exumas began to receive a trickle of tourists, as a few scant yachts arrived in the cays. Then on July 10, 1973, The Bahamas became independent after 300 years as a British colony. Independence furthered The Bahamas growing connection to the outside world, and tourism continued to rapidly expand in Nassau as well as in the Out Islands.

Today, visitation to the Out Islands makes up approximately 16 percent of all Bahamian tourism (Bahamas Ministry of Tourism, 1997). Although the Exumas are currently one of the least visited Out Islands in The Bahamas (4.5% of Out Island stop-overs), this may soon change (Bahamas Ministry of Tourism, 1995). The Exumas' natural beauty and proximity to Nassau makes these islands an increasingly attractive tourist destination, especially for cruising U.S. yachtsmen. With the Cays' crystal clear waters, isolated anchorages, land-locked harbors, and 365 cays to navigate and explore, it is no surprise that the Exumas have recently become known by yachtsmen as the "Sailing Capital of The Bahamas".

### The Exuma Cays Land and Sea Park

The most pristine and possibly the most beautiful area in the Exumas is located within the Exuma Cays Land and Sea Park (ECLSP). The Park, a designated fisheries reserve, is located in the northern extent of the Exuma island chain, 80 km south-east of Nassau. Although the Park covers a 56,410 ha area, only 1,460 ha (2.5%) is land (Sluka et al., 1996). When the Government of The Bahamas established the Park in 1958, the by-laws allowed for a daily catch quota per boat. In the 1970's, commercial fishing by Bahamians began to escalate within the Exuma region and the Park. Many of these fishermen utilized chlorine bleach when spearfishing for spiny lobster, *Panulirus argus* (Campbell, 1977). By the 1980's, fishing pressure within the ECLSP had increased so dramatically that in 1986, The Bahamas National Trust enacted new by-laws making the entire area a "no-take zone". The new designation made the Exuma Cays Land and Sea Park one of the first and largest marine fisheries reserves in the wider Caribbean. The very success of the Park as a "no-take" zone has attracted an increased number of visiting yachtsmen to the Exumas, coupled with heightened development of

privately owned islands. Visitation to the Exuma Cays Land and Sea Park has increased tremendously since the early 1960's, when less than 25 yachts passed through the Park in a single winter season. By the late 1970's, the number of boats within the Park had increased to 50 a day. The local Bahamians also began using the Park more, particularly during the summer months. Articles in yachting magazines and cruising guides helped to increase the awareness of the Park, and by 1994, an estimated three thousand foreign yachts cruised to the Park annually. Records show that the number of boats and the length of stay continue to increase each year (Figure 1).



**Figure 1. Yearly anchorage in the Exuma Cays Land and Sea Park (estimated totals based on available Park records)**

Visitors provide a significant source of income to the Park through user fees and donations. This revenue is important as the Park strives to become financially self-sufficient and continue to fund enforcement, education, and conservation program development. Although Park management would like tourism to generate revenue and support, the Park does not want to sacrifice its protection of critical habitats and preservation of replenishment areas for commercially important species (Lowe et al., in review). The long-term sustainability of the Park and of its natural resources will depend not only on the Park management but also on a regional plan for sustainable tourism in the Exumas.

	Nassau	Sampson/ Staniel Cay	Warderick Wells	George Town	Mail-out Survey	Total
Total Days	6	8	6	3	-	23
Weekdays	4	3	5	3	-	15
Weekend days	2	1	1	0	-	4
Holidays	0	4	0	0	-	4
<b>Total #</b>	<b>34</b>	<b>21</b>	<b>36</b>	<b>33</b>	<b>560</b>	<b>684</b>

### Questionnaires

**Table 1. Summary of tourism survey sampling effort**

## Materials and Methods

The survey methods were developed as a pilot project to outline basic information that can be used to develop management strategies for sustainable tourism within the Exuma Cays region. The survey can be used in the future to make temporal comparisons as to the impact of management actions or lack thereof.

In order to match tourism marketing to the product and at the same time protect the Exuma Cays experience, specific information was needed from the consumers (the visitors). A formal questionnaire was designed that targeted visitors to the Exuma Cays and to the Park. The questionnaire consisted of 33 questions that were divided into four sections; each section was organized to gather a specific type of information:

- The first section characterized the type of tourist who visits the Exuma Cays.
- The second section focused on the reasons why tourists choose to visit the Exumas.
- The third section contained questions about their visit to the Park.

The final section requested the visitors to provide any additional comments and recommendations they might have for improving the Park and the Exuma Cays experience.

The questions developed were primarily closed-ended with unordered responses except for four open-ended questions that required the respondent to provide lists or additional comments.

Two methods were utilized to conduct the visitor survey: 1) in-person interviews, and 2) mail-out questionnaires. The in-person interviews were conducted over a one-year period

(July 1997 to May 1998) using the formal questionnaire in Nassau, New Providence and three locations within the Exuma Island Chain (Table 1). Surveys were conducted on weekdays, weekends and holidays throughout the year. For implementation of the mail-out surveys, mailing lists were obtained from the ECLSP Support Fleet as well as from several charter boats that visit the Exuma Cays. One questionnaire was sent to every individual/ household on the lists, totaling 1,852 questionnaires.

In addition to the tourism survey, a summary of the Exuma Cays Land and Sea Park Visitors' Log was compiled that included visitors' date of entry to the Park, country of origin, number of persons on board, length of stay, number of prior visits, and activities of interest. Log entries were taken from January 1, 1996 to February 2, 1998.

## Results

### Summary of Survey Effort

- Total number of in-person interviews completed was 124.
- Total number of mail-out questionnaires returned was 560.
- There was a 30% rate of return for mail-out questionnaires.
- Total number of questionnaires completed was 684.

Characteristics	% of Sample
<b>SEX</b>	
Male	54.7
Female	26.3
Couple	7.8
No Response	11.2
<b>AGE</b>	
under 20	0.5
20-29	2.0
30-39	6.8
40-49	19.3
50-59	39.2
60 +	32.2
<b>HOUSEHOLD INCOME</b>	
< 20	5.4
20-40	18.9
40-80	32.4
80 +	43.3

**Table 2. Demographic profiles of total visitor sample**

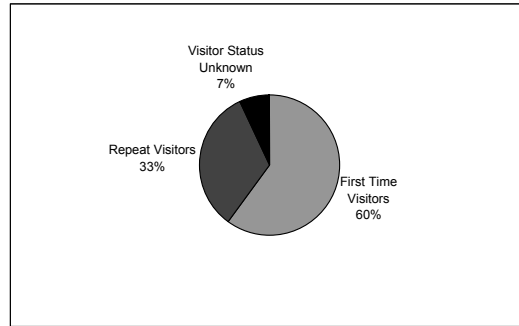
- Total number of Visitor Log entries taken was 871.

The survey results established several key issues that need to be addressed within the Exuma Cays. Each of these issues will be addressed and presented in the form of specific recommendations for regional tourism monitoring and management.

- **Exuma visitors tend to fit into a narrow demographic profile, indicating that the Exumas currently attracts a very specific visitor type.**

It is only possible to enter the Park by boat, and there are very few charter operations in the area. Thus, it is not surprising that the majority of visitors surveyed were yachtsmen with privately owned boats (96%). Over 80% of these visitors were from the United States, primarily from the state of Florida. Most visitors were in their fifties or above (Table 2). Only 9.3% of the study population was under forty years old. Re-

ported annual household income of the visitors surveyed was primarily greater than \$80,000 (43.3%) or between \$40,000 and \$80,000 (32.2%). In order for the Park to retain support and build stakeholder value, management must consider the expectations of this group of visitors. Recommendations for tourism management within the Park can be developed based on this visitor profile.



**Figure 2. Comparison of first time versus repeat visitors to the Exuma Cays Land and Sea Park in 1997**

- **There are more first time visitors than repeat visitors to the Exuma Cays Land and Sea Park.**

According to the ECLSP Visitor's Log, over half of Park tourists are first time visitors (Figure 2). Park management is faced with the task of educating these visitors as to the fishing restrictions and other regulations such as anchoring and garbage disposal. This requires time and staff support from a marine park that lacks specific management plans and adequate financial backing. In addition, many repeat Exuma visitors do not stop in the Park. There is also less incentive for repeat Exuma visitors to re-visit the Park, as much of the Exumas is perceived to be of similar environmental quality, and no fees are charged for mooring or resource use outside of the protected area. This should be a critical management issue for both visitor education and appropriate assessment of resource use by visitors throughout the region.

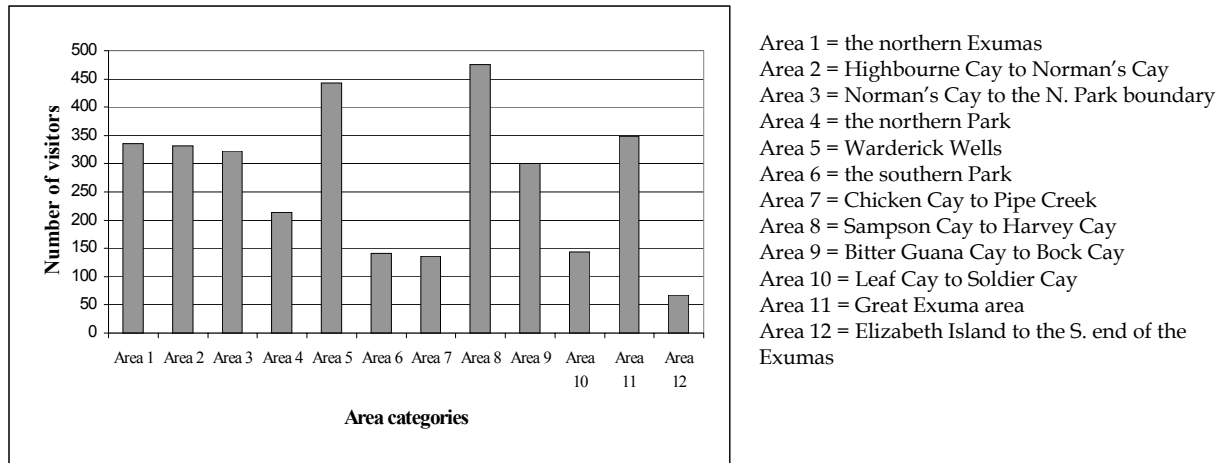


Figure 3. Distribution of areas visited by yachtsmen in the Exumas (from north to south)

- **Most yachtsmen do not target the Exuma Cays Land and Sea Park as a single tourist destination or motivation for visiting the Exumas.**

Although the Park, Staniel Cay and George Town are tourist “hot spots”, most visitors do not have one particular destination. Instead, the yachtsmen “cruise” the Exuma island chain while over-nighting in many areas throughout the region (Figure 3). Although yachtsmen briefly visit many Exuma islands, the visitors surveyed spent the majority of their time in Nassau (38%) and the George Town, Exuma area (36%). The average length of stay of the respondents was as high as 28 nights in George Town and 23 nights in Nassau. The visitors averaged 7 nights in the Exuma Park. This again provides insight to the visitors’ perception of “wilderness” environments and their lack of appreciation for any differences in environmental quality inside versus outside the Park.

- **The Exumas islands represent a natural or “wilderness” experience for most visitors, and they do not want tourism infrastructure or services located within the Park.**

Most visitors ranked the “natural beauty” of the area as their primary reason for visiting the Exuma Cays region as well as the Park. Low priority is given to services or activities as motivations for tourism (Figure 4). Visi-

tors do not want tourism infrastructure such as hotels, bars, restaurants and water craft rentals in the Park. Instead, Exuma visitors want to experience nature through SCUBA diving, snorkeling, boating or hiking (Figure 5).

- **The new user fees initiated in November, 1997 and the recent development within the Park is weakening stakeholder support.**

Ninety-eight percent of the visitors surveyed knew about the Exuma Cays Land and Sea Park, and most of these visitors were aware of the fishing restrictions and other regulations. Thus, the Park seems to be highly publicized within the Exumas. Most visitors reported that they knew about the Park from publications such as *The Exuma Guide* (40%) and from “word of mouth” by previous visitors, teachers or friends (33%). There is an extremely high level of communication among yachtsmen in the Exumas, but there is limited communication and outreach from Park management itself. This has led to conflicting perceptions of the mission of the Park among visitors, Exuma residents and The Bahamas National Trust. Visitors feel that the new user fees are being used for private gain, and residents see the Park being cleared for the development of private homes for foreign investors. At this point, it is important that a management plan is developed that clearly outlines the Park’s mission as well as

goals and strategies that provide support and rationale for the vision.

## Discussion

Tourism development in tropical island systems produces five measurable and avoidable threats to the environment (Pattullo, 1996):

- Water quality threats include contamination of ground water, land-based sources of pollution to near-shore marine environments and depletion of fresh water resources. Many water quality threats are associated with water use patterns (e.g., sustaining a golf course) and wastewater treatment.
- Solid waste threats are particularly difficult on a carbonate island as solid wastes dumped in landfills accumulate and create a more difficult problem with time.
- Transportation threats include the physical impacts on land and sea to create airports, roads, marinas, and navigation channels as well as associated problems with fuel storage.
- Energy threats include the infrastructure needed to meet the energy needs of tourism, including power generation, tank farms, communications infrastructure and power delivery.

Harvesting threats include the removal or depletion of species such as reef fishes for sport or consumption by tourists.

The provision of tourism services on remote islands is expensive and problematic. Often, practices used in a low-density setting have only a minimal impact on the environment (the solution to pollution is dilution). Sustainable tourism planning requires a vision as to the density or level of visitation that can be tolerated by the available infrastructure and the local environment. This planning requires a partnership of managers,

local stakeholders and scientists to build an understanding of the expectations and condition of ecological systems.

The Exumas Cays provide an excellent study site for the issues and strategies for sustainable tourism development. There is already a highly valued and desired product, a high-income tourist market, and sufficient ecological data on the area to assess degradation and potential recovery. Several key recommendations can be made from the survey of Exuma visitors:

1. *Understand the market.*

As in many tourism markets, the history of Exuma tourism is dynamic and marked with boom and bust cycles. Once a haven for pirates and drug runners, the Exumas Cays evolved into a prime destination for active charter boat operations and island resorts. Poor marketing strategies, the continued presence of drug trafficking activities, and the revocation of the charter boats' duty free status eventually lead to the collapse of what was once a prosperous industry. Today, there are very few charter operations remaining in the Exumas, and many of the larger hotels have been deserted, leaving unsightly remains and no economic benefits.

Yachtsmen with privately owned boats now dominate the Exuma tourism market; this market continues to be highly volatile and linked to global economic conditions. Exuma tourists are concerned about the user fees and development within the Land and Sea Park, the future of Elizabeth Harbour in George Town, and the increased development throughout the island chain. Yachtsmen visit the Exumas to enjoy the undeveloped state of the environment, not for the presence of resorts, shopping malls, or jet skis. It is important that the Ministry of Tourism, as well as foreign and domestic businesses, understand the current tourism market to both conserve the product and value it appropriately.



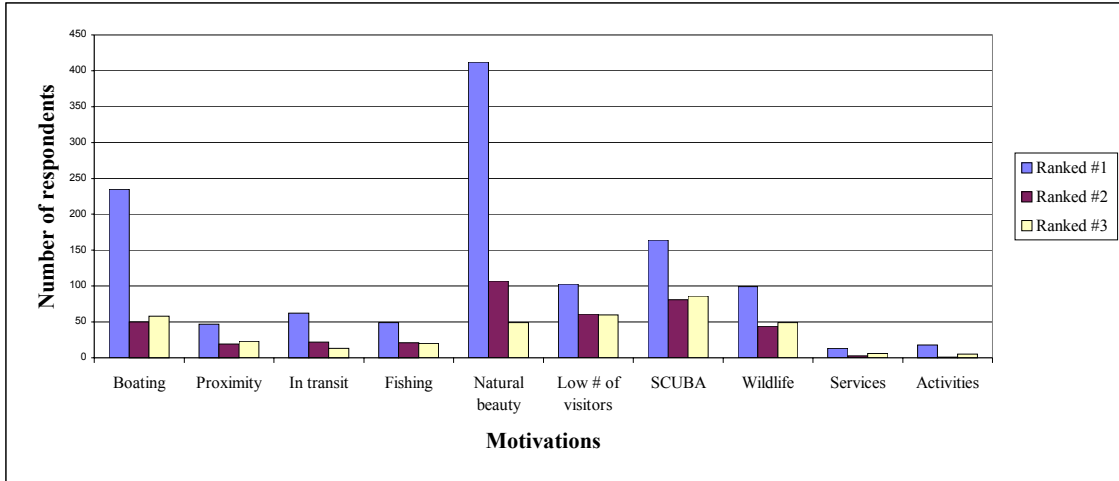


Figure 4. Tourist motivations for visiting the Exuma Cays

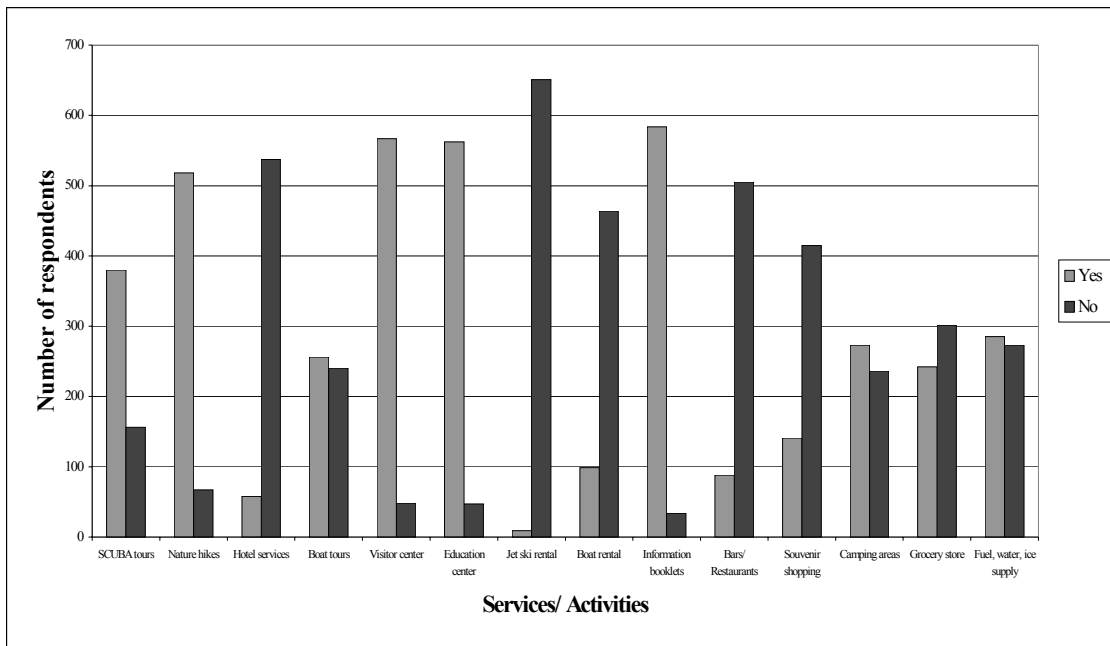


Figure 5. Services and activities visitors would allow in the Exuma Cays Land and Sea Park

2. *Promote inter-agency and region-wide cooperation for planning infrastructure development and marketing on a regional level.*

The Ministry of Tourism, The Bahamas National Trust, the Exuma Cays Land and Sea Park management, the local government of George Town, foreign and domestic tourism operators, and local residents maintain a vested interest in the Exuma Cays tourism industry. Unfortunately, no one agency is responsible for coordinating a common tourism message. Visitors to the region do not distinguish between jurisdictional boundaries, and the success of any one entity, whether it be the Park or particular settlement, depends on regional cooperation for collective visitor management. Presently, the Park has initiated programs to protect the seabed (e.g., installing mooring buoys in sensitive or heavily used areas); however, programs such as these are needed in other areas of the island chain. A regional planning, management and regulatory structure needs to be developed for the Exumas that includes the Park as one component for the protection of the larger ecological system.

3. *Increase stakeholder value by providing an outreach and education program for both visitors and residents.*

Residents and tourists alike place a high value on the Exuma Cays experience and feel that they have a "stake", or investment, in the region. These stakeholders should be provided with information and insight into the decision-making process. It is vital to implement an outreach and education program that emphasizes the unique environmental quality of the Exumas and the associated costs of maintaining this coastal system. Stakeholders, particularly visitors, need to be informed on how the Park, the local government and the central government are meeting their needs (limiting visitors, addressing the threats from tourism development, practicing responsible resource management) in order to maintain support for the region and the industry.

4. *Implement and integrate resource management planning on a region-wide basis.*

The Park is one protected area within a larger ecological and economically linked region. Within this region, the goals and objectives of resource management need to be clearly articulated. Management programs within areas such as the Park or Elizabeth Harbour need to address specific ecological measures of success. For instance, a strategy to designate anchorages or provide mooring buoys would include specific objectives to protect corals, seagrass beds or other seabed communities. The cost of management for specific ecological goals needs to be addressed through a financial plan - how much money is required to protect the ecology of the area and provide a unique tourism experience?

### **Final Note**

This pilot study served as an effective tool for gathering initial information to develop tourism management strategies, however, because the tourism market is dynamic, information on the current visitor structure is reliable for only a specific amount of time. A procedure for monitoring visitors should be developed to keep tourism information updated. In-person questionnaires are relatively inexpensive for local agencies or businesses to conduct, and a simple database can be used to store and analyze survey data.

In the Exumas, the Exumas Education Resource Center or the Ministry of Tourism should be responsible for monitoring tourism trends. The agency should develop a questionnaire that can be distributed every 2 to 3 years to survey visitors to the region. Currently, at least 200 questionnaires should be completed; however, this number should change respective to visitor levels. Surveys should be conducted in areas such as Staniel Cay, the Park and George Town. Once the information is collected, the agency in charge should be responsible for analyzing

the data, disseminating the results, and updating sustainable tourism strategies.

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