

Acknowledgements

Smith Warner International would like to thank Dr. Simon Clarke and Mr. Andrew Ross for willingly contributing their time during the field investigations for this report.

Table of Contents

1. Introduction.....	3
1.1. Project Background.....	3
1.2. Project Objectives	3
1.3. Document Objectives.....	4
2. Site Description - Montego Bay	5
2.1. General Description	5
2.2. The Montego Bay Marine Park	6
2.3. Water Sports Activities.....	7
2.4. Maritime Safety	11
2.5. Environmental Conditions.....	12
3. Carrying Capacity Analysis	17
3.1. The Concept of Carrying Capacity	17
3.2. Determining Recreational (Boating) Carrying Capacity	18
3.3. Carrying Capacity Analysis for Montego Bay	20
4. Marketing Analysis	23
4.1. Background & Methodology	23
4.2. S.W.O.T. Analysis.....	24
4.3. Findings of User Survey	25
4.4. Market Size & Potential for Growth.....	28
4.5. Watersports - Competition for Jamaica.....	29
5. Summary of Findings & Recommendations.....	32
5.1. Watersports Capacity, Safety & Zoning	32
5.2. Environmental Concerns.....	32
5.3. Recommendations.....	32
6. References.....	36

1. Introduction

1.1. Project Background

With the growing number of visitors to Jamaica over the past decade, there has come an increase in the number of hotels, and the number and variety of water sports offered around the island. Additionally, the growth of the hotel and leisure watersport industry throughout the country has had a significant impact on the coastal and marine ecology of several of our resort areas. This has also had impacts on safety, with reports being made of frequent marine accidents. In fact, for the period January 2001 to December 2003, 43 watersports-related incidents were reported. These issues have the potential to negatively affect tourism and watersports activities in Jamaica.

The Maritime Authority of Jamaica (MAJ) in conjunction with the Ministry of Industry and Tourism along with other concerned agencies is interested in streamlining the management of leisure water-sporting activities, and to integrate this into an overall framework for inter-sectoral management of tourism products, coastal environmental health and marine safety. As such they have commissioned a study, to be coordinated and managed by the Tourism Product Development Company (TPDCo), *to determine the capacity and safety in marine recreational areas in Jamaica.*

In November 2004 TPDCo contracted *Smith Warner International* to carry out the desired capacity and safety studies in six designated areas around the island, as follows:

1. St. Ann to St. Mary (including Ocho Rios, Tower Isle to Mammee Bay Point, Runaway Bay and Discovery Bay);
2. Negril (Bloody Bay to Norman Manley Sea Park);
3. Port Antonio (East and West Harbours);
4. Montego Bay (Bogue Lagoon to Rose Hall Beach);
5. Kingston (Lime Cay to Port Royal); and
6. St. Elizabeth (Black River up to Broad River).

1.2. Project Objectives

There are five (5) primary objectives for the overall capacity and safety study. These are to:

- I. Establish optimum capacity(ies) for water sports operations in Marine and Riverine Recreational Areas islandwide;
- II. Provide guidelines for the delimitations of zones for water sports activities in the determined focus locations, especially in Marine Parks;
- III. Document the environmental impacts of the water sports on the focus areas;

- IV. Provide guidelines for the overall development of water-sports activities in Jamaica in relation to safety, security and marine/riverine pollution prevention; and
- V. Recommend better environmental management systems for the marine protected areas.

Additionally, the TPDCo is interested in determining the potential impact of zoning and leisure-craft regulations on the tourism product (visits by tourists to the island) and as such required that a marketing study be done to ascertain such information and to guide the development of marketing and promotions pertaining to regulated water sports activities.

The ultimate intention is that the findings of this study will be used to guide the pending legislation related to watersports activities around the island.

1.3.Document Objectives

This document conveys the findings and recommendations for one of the six locations studied, *Montego Bay*. The information presented in this report has been obtained through desk review, and field investigations¹, and is offered to assist decision-makers in formulating policies and regulations to ensure safety and environmental health in Montego Bay. The recommendations outlined are intended to be used as tools in the evaluation of options for minimizing user conflicts, incidents and environmental concerns in the locations studied in Montego Bay. Further information on the overall development of water-sports activities in Jamaica in relation to safety, security and marine/riverine pollution prevention will be presented in the Final Report for the overall Capacity & Safety study.

This report addresses the following:

- The nature and extent of watersporting activities in Montego Bay.
- The recreational carrying capacity of areas in Montego Bay.
- The characteristics of the Montego Bay watersports market.
- Recommendations and a summary of the findings.

¹ Site visits made June 30 to July 2, 2005.

2. Site Description – Montego Bay

2.1. General Description

Located on the Northwest coast of Jamaica, Montego Bay is the nation’s second city, and one of the major resort-destinations in the island. The city and the tourism industry are supported by the presence of a major International Airport, a commercial seaport, and a cruise ship terminal.

The Montego Bay coastline is used primarily for tourism ventures, ranging from hotels to restaurants, to beach parks and boating facilities. The immediate shoreline areas are relatively densely developed and bustling with activity. For the purpose of this study, the area considered for this report spans from the Bogue Lagoons in the west to the Rose Hall Beach Club in the east (see Figure 2.1). This area itself can be subdivided into three distinct areas: The Bogue Lagoons, Montego Bay (Harbour) and the west to east span of the Airport to the Rose Hall Beach Club.



Figure 2.1 Satellite Image of the study area in Montego Bay

2.2. The Montego Bay Marine Park

A large part of the area being considered for this report falls within the Montego Bay Marine Park (MBMP). The MBMP is a national park, established in 1991 under the Natural Resources Conservation Authority Act (NRCA, 1991), with the primary intention of protecting the marine resources of Montego Bay. In 1996, the management of the MBMP was undertaken through a delegation agreement with the NRCA by the Montego Bay Marine Park Trust (MBMP Trust), a not-for-profit non-governmental organization (NGO).

The MBMP Trust's main duties involve protecting and managing the natural resources of the Marine Park, which include scientific monitoring, interpretive enforcement of park regulations, and community outreach. The regulations of the park are guided by the Natural Resources Conservation (Marine Parks) Regulations of 1992. Among the park regulations are the use zones of the park, as depicted in Figure 2.2.

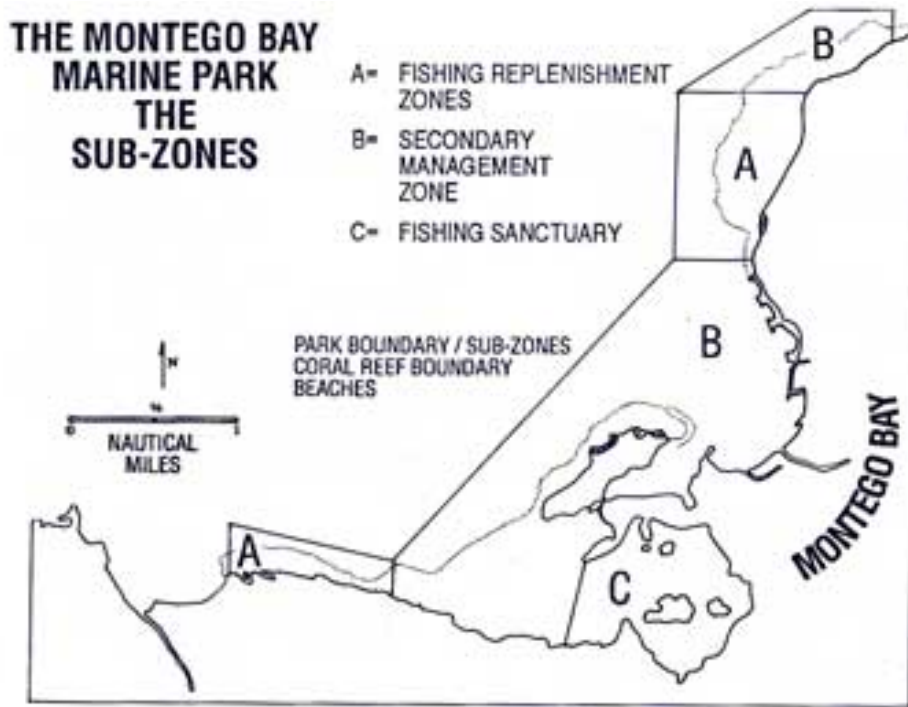


Figure 2.2 The Montego Bay Marine Park and Sub-zones.

One of the management strategies for the MBMP is a no-anchoring policy in the park. In order to facilitate local boaters and tourism entities, the MBMP Trust installed approximately 40 mooring buoys around the park. However, due to a lack of funding, several of these buoys have been lost and not replaced, and many of them are limited in their functionality as a result of lack of maintenance.

2.3. Water Sports Activities

2.3.1. Nature and Extent of Watersports Activities

In addition to wading and swimming a wide range of watersports, involving both motorized and non-motorised vessels, occur along the entire study area. Most of the watersports activities take place in association with Hotels/resorts, and a fewer number of these activities are operated independently, in public areas or in association with a private venture.

The non-motorised activities take place with the use of two main types of vessels:

- Sailing vessels (hobie cat, wind surf, sunfish); and
- Paddle vessels (kayaks, pedal boats, water tricycles).

Another common non-motorised activity in the study area is the use of water-trampolines.

The motorised activities include:

- Jet-driven personal water craft (jet skis/waverunners);
- Towed tours (parasail, banana ride, waterskiing, wake boarding);
- SCUBA tours (requires the use of a boat, the activity itself is not motorized);
- Snorkelling tours;
- Cruising tours (glass bottom boats, semi-submarine, catamarans, party tours); and
- Fishing tours (including catch and release fishing).

Swimming and wading

Swimming and wading take place in the beach areas particularly those associated with hotels, as well as in locations adjacent to other coastal attractions, such as Margaritaville. Most facilities have designated and demarked swimming areas, and general respect is given to the prescribed use of these areas.

Swimming occasionally takes place outside of the designated areas in cases where persons are snorkeling. In particular, some catamaran and glass-bottom tours offer snorkeling experiences further offshore, where the snorkelers are not restricted to a particular area, and are only visible by the presence of the tour boat, and in some instances by the brightly coloured snorkels.

Non-motorised activities

Small sailboats and paddling vessels are launched from the beach and are generally used close to shore (contained by the fringing reef at the eastern end of the study area). Some windsurfers, hobie cats and occasionally kayaks venture further offshore.

Motorised activities

Cruising tours, such as the semi-submarine operation, and glass-bottom boats, operate where the water is shallow enough to view the seafloor from the vessel and where there may be interesting things to be viewed. This has these boats congregating just offshore of Doctor’s Cave beach in Montego Bay, and at select other locations between the airport and Rose Hall beach Club. Other cruising tours include ‘pirate cruises’ and catamarans. These tours collect passengers at various points, such as Pier I and Doctor’s Cave, and then cruise outside of the harbour. The tours often stop at points of interest, such as Margaritaville, or they take a tour through to the lagoons.



Jet Skis are available from a few licensed watersports operators in the area. Several local residents also own and use jet skis for their personal recreation. The commercial jet skis are generally operated in the vicinity of the Walter Fletcher Beach, Tropical Beach and at various points between the airport and Rose Hall Beach. Some of the personally owned jet skis are operated in the Bogue Lagoons.



The *towed tours* offered include water skiing, parasailing, banana boat rides and ‘tubing’. These activities are somewhat constrained in time and space by the availability

of large areas of calm sea, and the parasailing in particular, is restricted in areas approaching the airport. Many of these towed activities actually take place outside of the reef or in the lagoons. Occasionally, they are offered in the vicinity of the harbour.

Fishing canoes and sport fishers frequent the area. In the early morning in particular, several small fishing canoes can often be seen in the harbour, or along the reef areas. A few sport fishers operate from the Yacht Club, and there is one operator offering Catch and Release fishing throughout that area.



Dive boats tend to be associated with hotel/resort facilities. They often load from jetties or near to shore, and typically head offshore towards the reefs and other such areas of interest.

Berthing & storage

Most of the motorized vessels associated with hotel properties are moored adjacent to the property. Other vessels tend to be moored at one of a few 'safe harbours' in the area, including the Seawind Island area, Bogue Lagoons, Pier I and Whitehouse/Tropical Beach. Additionally, several sailboats and motorboats are moored at the Montego Bay Yacht Club. Some of these vessels are used commercially, others are privately owned and used for personal recreation, and yet others are in transit, registered outside of Jamaica.

The mooring buoys installed in the MBMP by the MBMP Trust are used for temporary mooring during recreational activities, and are not generally used for the purpose of overnight mooring.

There is also a dry dock facility, operated by Sandals, just east of the end of the airport runway, where the hotel chain stores their vessels for maintenance and repairs.



2.3.2. Watersports Operators

Records provided by the Jamaica Tourist Board indicate that there are 34 watersports operators registered in Montego Bay, of which 25 are licensed to operate within the study area. The majority of these operators are associated with hotel properties, and only a few are independent. The operators are licensed for a variety of activities, motorized and non-motorised, including: glass-bottom tours, water skiing, parasailing, jet skiing, scuba diving, sailing, kayaking and paddle boats.

There was no evidence of unlicensed operators conducting business in the area.

2.3.3. Water vessels

Information obtained from the Maritime Authority of Jamaica indicates that there are 174 vessels registered in Montego Bay (up to December 2005). These include both personal and commercial (tourism) vessels, and cover both motorised (35) and non-motorised (139) vessels. These figures do not consider the numerous fishing vessels (canoes and dugouts) in the area

In addition to those registered here in Jamaica, several vessels registered in other territories are moored at the Montego Bay Yacht Club. Furthermore, there are several

vessels stored on land at the Yacht Club, at private residences, at various resort properties, and at the Sandals dry dock facility.

Table 2.1 Number of motorized vessels observed to overnight in the Study Area

<i>Location</i>	<i>Number of vessels</i>
Bogue Lagoons	2
Seawind Bay	15
Montego Bay Yacht Club	38
River Bay Fishing Beach	33
Pier I	21
Tropical Beach/Whitehouse Fishing Beach	24
Holiday Inn	5
Half Moon	2
Rose Hall Beach Club	4
Total	144

It should be noted that the observations made of the number of vessels that overnight in the study area were limited by the inability to access in a timely manner all sites in the extremely large area considered. Access to some of the all-inclusive properties was especially challenging. Furthermore, it was not possible to identify and count all the non-motorised vessels, as these were often stored out of sight.

2.4. Maritime Safety

During the period January 2001 and December 2004 there were 10 reported watersports related incidents in Montego Bay. Five (50%) of the reported incidents involved jet skis. Two of the incidents resulted in drowning, one of which was apparently as a result of the unavailability of a rescue boat.

2.4.1. Safety Procedures

General safety procedures were adhered to for the most part, with many operators displaying the necessary safety gear and practices. In the harbour itself, respect was observed for the rules of the shipping channel, and rights of way. There were some instances of operators (especially jet ski users) not showing regard for the rules of the water.

On land, many facilities had signs regarding safety posted at appropriate locations.



2.4.2. Rescue Boats

At the larger facilities, rescue boats were evident, anchored in the nearshore areas. However, for the smaller operators, very few rescue boats were observed on the water ready to go. Several were seen on shore or on trailers.

2.4.3. Traffic Patterns

There were no distinct traffic patterns observed in any of the three regions of the study area. However, there are specific activities which generally take place in particular areas at certain times. Cruise tours have established departure times and a number of routes, and they typically depart from the point of origination, head out into the open water, and then return at the allotted time. Dive boats operate in a similar manner, while other activities are less predictable in time and location, being driven by demand.

Use patterns in general are such that non-motorised activities tend to take place within close proximity of the shoreline, except for some sail boats which venture further off shore. Motorised activities tend to take place in the vicinity of the harbour or seaward of the reefs.

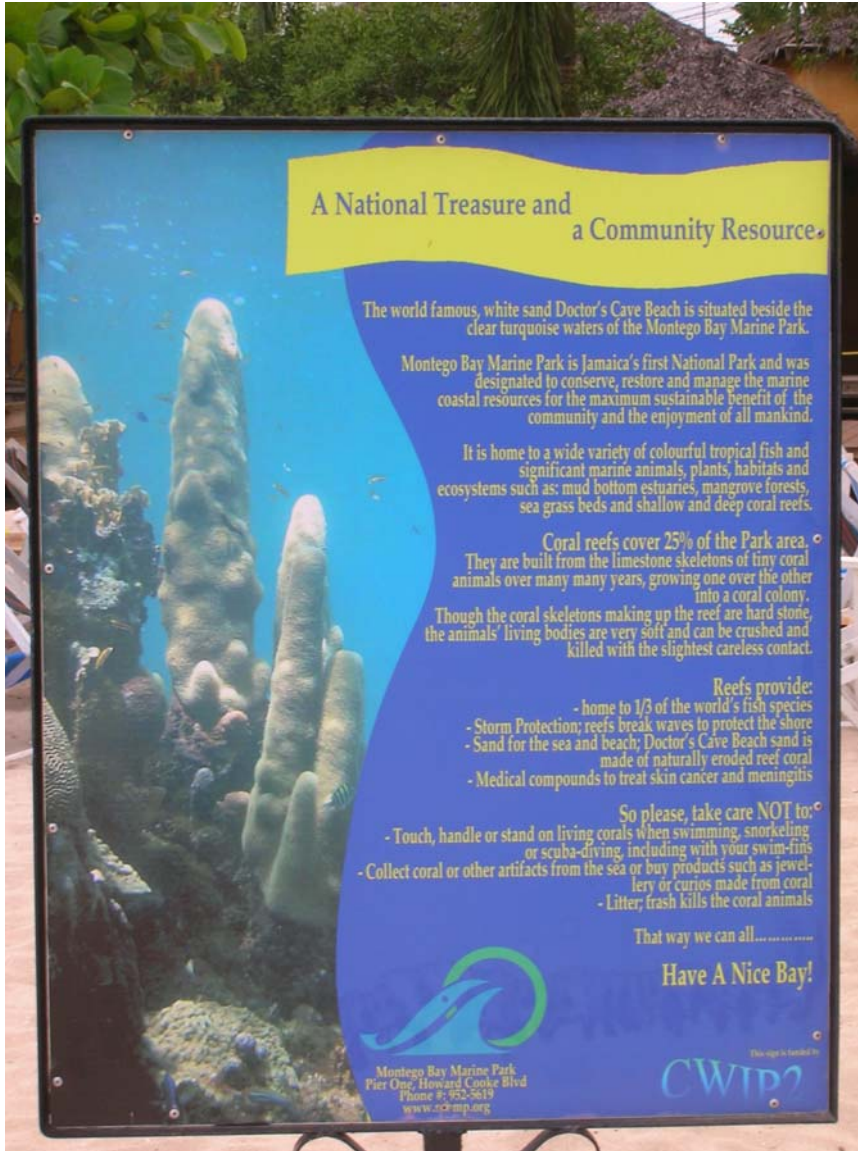
Although no cruise ships were observed in port, and only one cargo ship was seen leaving the harbour, it is reported that general respect is given to the International Ship and Port Facility Security code (ISPS code), and the requirements for a certain distance to be maintained by other vessels from the ships.

2.5. Environmental Conditions

Despite the fact that a large part of the study area falls within the MBMP, a declared protected area, there are several substantial environmental issues facing the Montego Bay coastline. Among the major problems are the poor water quality in some locations

(associated with the outflow of gullies and rivers and other land-based sources of pollution), the declining health of coral reefs, and the waning fish populations.

Some efforts are being made to improve and manage the health of the area, including the Blue Flag programme.



2.5.1. The Blue Flag Campaign

The Blue Flag Campaign for beaches and marinas is a voluntary programme intended to provide identification of certified environmentally-friendly and safe beaches and marinas. The Campaign is owned and run by the Foundation for Environmental Education (FEE), a not-for-profit non-governmental organization based in Denmark.

The concept of the Blue Flag began in France in 1985 and was formalized throughout Europe in 1987. The Blue Flag is now flown in over 29 countries, and the Campaign has

proven to be an effective environmental management tool especially regarding water quality standards, safety standards and environmental advocacy through education.

The Doctors Cave Bathing Club was designated a Blue Flag in November, 2004.



The **Caribbean Blue Flag** programme was established in 2001 and formalized in 2002, and is currently operated by a consortium comprised of the Caribbean Conservation Association (CCA), the Caribbean Tourism Organisation (CTO) and the Caribbean Alliance for Sustainable Tourism (CAST).

The award of the Caribbean Blue Flag is based on compliance with more than 20 criteria, covering the following categories:

1. Water Quality
2. Environmental Education and Information
3. Environmental Management
4. Safety and Services.

Among the requirements and responsibilities associated with flying the Blue Flag, the annual certification requires these facilities to do the following:

Water Quality

- Compliance with requirements and standards of Class I Waters as defined by the Protocol Concerning Pollution from Land-based Sources and Activities.
- No direct discharge of industrial, sewage effluent or storm water to the beach.
- Monitoring of the health of coral reefs located in the vicinity of the beach.

Environmental Education and Information

- Information about bathing water quality should be prominently displayed.
- Information about sensitive environmental resources should be available.

Environmental Management

- Environmental management of the beach taking into account sensitive species and habitats must be carefully planned and enforced.

- All buildings and equipment of the beach must be properly maintained.
- The entire length of the beach must be clean.

Safety and Services

- An adequate number of trained lifeguards and lifesaving/first aid equipment must be available at the beach.
- There must be management of different users and uses of the beach so as to prevent conflicts and accidents.

2.5.2. Land Based Pollution

There are a number of sources of pollution from land that affect the study area. Several gullies and drains, two major rivers, and several streams, enter the water at various points along the shoreline of the area. These water bodies bring to the marine environment several pollutants, sediments and substantial volumes of solid waste. Furthermore, in the areas typically used for boat storage, old boat parts, and semi-submersed vessels /hulls have been disposed of along the shoreline or in the nearshore waters.



2.5.3. Ship source pollution

Pollution from the recreational/commercial boats in the area is also a concern for the marine environment. There are no official pump-out facilities in the Montego Bay area despite the numerous ocean-going vessels in the locale. As such waste from vessels is often disposed of directly into the sea (albeit, usually offshore). This may also apply to the larger ships and cruise ships which use the port facilities.

In addition, apart from the Sandal's facility which serves their vessels, there are no designated commercial boat maintenance facilities in Montego Bay, and so general boat repairs and cleaning are often conducted at the point of mooring, resulting in the random release of harmful chemicals and oils to the marine environment. Bilge water is also often released at dock.



2.5.4. Refueling

Spills and releases during refueling activities are another source of concern to the environment of the area. The only contained and monitored refueling facility for the recreational and commercial boaters is located at the Yacht Club. All other vessels are refueled using drums at docks, on the beach or even in the water.



3. Carrying Capacity Analysis

3.1. *The Concept of Carrying Capacity*

The term carrying capacity is derived from ecological science, where it represents the number of organisms that the physical and ecological resources of a given area can support in a particular period of time. A similar meaning has been given to the term which has been adopted by various other disciplines, among them tourism management and recreational management.

3.1.1. Tourism (Visitor) Carrying Capacity

In the tourism industry, carrying capacity refers to the number of people who can use a given area in a particular period of time without an unacceptable alteration to the physical environment. For coastal and marine destinations the determination of tourism/visitor carrying capacity has typically been associated with marine protected areas (MPAs), and has addressed the number of visitors that can be accommodated at a particular site each year without an unacceptable impact on the physical and ecological resources.

Strictly speaking, the visitor carrying capacity is a determination of the maximum number of people that can be accommodated in a given area at a given time. It asks the question '*How many visitors is too many?*'. For example, how many divers can be accommodated at a coral reef location each year without causing an unacceptable change to the reef system? Conducting such carrying capacity assessments often proves challenging given the difficulties of measuring 'unacceptable impact'. This requires knowing what amount of change to the reef is acceptable, which itself necessitates substantial data, and the findings can be quite controversial.

Giving consideration to this limitation of measuring 'unacceptable impact', a basic formula for calculating tourism (visitor) carrying capacity was developed by the WTO and UNEP in 1992. The equation is:

$$\text{Visitor Carrying Capacity} = \text{Area used by visitors} \div \text{average individual standard}$$

The average individual standard, measured in unit area per person, is the space a visitor requires for an acceptable experience at the location. This is therefore a subjective value, and is dependant on a number of factors including: the type of area, the activities undertaken and the management initiatives at the location. However, while acceptable experiences are subjective, measuring them is less difficult and controversial than measuring unacceptable impact.

This approach to determining visitor carrying capacity is more in keeping with the concept of **Limits of Acceptable Change** (LAC). The determination of LAC does not itself provide a 'carrying capacity' in its strict sense, but it provides a set of conditions, (biological, physical and social) that are deemed to be appropriate by resource managers. The determined limits are intended to reflect values, preferences, science, policy and public input, and can be maintained through a variety of policies. The LAC

can therefore still answer the question, 'how many visitors is too many?', and often leads to a management approach that involves resource use zoning.

3.1.2. Recreational Carrying Capacity

With respect to recreational management, such as is applied in terrestrial parks and on rivers and lakes, the term carrying capacity is used to indicate the number of vessels/entities that can be operated within a defined location without compromising safe recreational use, aesthetic enjoyment, and/or environmental quality (Progressive AE, 2001). Some typical recreational carrying capacity studies assess the number of kayak entities that can occupy a waterway, or the number of water vessels that can operate on a lake at a given time without negatively affecting safety, aesthetics and/or environmental quality on the waterway or the lake. Essentially, such recreational carrying capacity assessments aim to answer the same general question 'how many is too many?'

The general equation for determining recreational carrying capacity is as follows:

$$\text{Recreational Carrying Capacity} = \text{Area suitable for recreation} \div \text{Desired density.}$$

Desired density, measured as the number of vessels per unit area, is the space required for each vessel in order to promote safe use, aesthetic appeal and environmental quality. Similar to the average individual standard used in tourism carrying capacity determinations, the desired density is a subjective value, and is dependant on a number of factors including time, location, activities offered and management approaches. The concept of recreational carrying capacity, like visitor carrying capacity, is as much perception as it is science (Mahoney and Stynes, 1995).

3.2. Determining Recreational (Boating) Carrying Capacity

In the context of marine recreational areas and for the purpose of this study, carrying capacity can be defined as the number of vessels that can be operated in a given location without compromising safe, recreational use, aesthetic enjoyment and/or environmental quality. Calculating recreational carrying capacity can be done according to the abovementioned formula. For example, in a location with an area of 100 acres suitable for recreation, and a desired boat density of 10 acres/boat, the recreational carrying capacity is as follows:

$$\text{Recreational Carrying Capacity} = 100\text{m}^2 \div 10 \text{ m}^2 \text{ boat} = 10 \text{ boats}$$

Such a location could accommodate 10 boats at a time safely without compromising aesthetics or environmental quality.

In order to determine the area suitable for recreation and the desired densities, the following parameters need to be ascertained:

1. The **physical characteristics** of the location, including the available water surface area, the maximum depths, the mean depths, and the shoreline accessibility. This can be done from charts, maps, aerial or satellite photography.

2. The **use characteristics** of the area such as the number and types of vessels. This can be obtained from licensing records and field surveys.
3. The **usable water area**. This is a determination of the areas that can safely accommodate water-based activities. Areas that are too shallow, too rocky, have strong currents, are shipping channels etc., may be deemed not-usable, and should be subtracted from the total available water surface.
4. The **desired vessel density**. This is the most subjective component of the capacity study. In previously conducted studies, the desired densities have been determined through:
 - analysis of spatial requirements of different boat types;
 - requirements for safe vessel operation; and
 - social research (through surveys) that ascertained the user groups, their perceptions of crowding, and acceptable levels of change to the environment.
5. The **use rate**, to note the differences between typical and peak use times.
6. The potential **environmental impacts**, with an awareness of the ecology of the area, and the threats to the sensitive organisms and areas.

Essentially, no conclusive studies have been done that answer the general question: *How many vessels is too many?* There is therefore, no single standard that can be applied in all situations for the desired boating density. This can be attributed to the fact that, ultimately, recreational capacity decisions are about people’s access to recreational opportunities and the quality of their experiences (Chilman). Each location is different, and users will have different perspectives on *what is too many vessels*.

Nonetheless, the few studies that have been done with the objective of determining optimum boating densities, have come up with ranges of acceptable boating densities, based on user groups, activities, safety, and user perceptions. These are summarized in Table 3.1.

Table 3.1 Summary of Optimum Boating Densities

<i>Source</i>	<i>Recommended Density</i>	<i>Uses Prescribed</i>
Jackson et al, 1989	20 acres/boat (81,000 m ² /boat)	Waterskiing & Motor Cruising
	8 acres/boat (32,000m ² /boat)	Kayaking & Sailing
	10 acres/boat (40,500 m ² /boat)	All uses combined
Duke Power, 1999	4 acres/boat (17,000 m ² /boat)	Fishing, Sailing & Jet Skiing
	1 acre/boat (5,000 m ² /boat)	Canoe/Kayak
	9 acres/boat (36,000 m ² /boat)	Motor Boating
	12 acres/boat (49,000 m ² /boat)	Water Skiing.

3.3. Carrying Capacity Analysis for Montego Bay

3.3.1. Assumptions

Research has shown that with increasing density of boats, the potential for negative impacts increases. However, despite a growing interest in recreational carrying capacity and recreational boating management, only a few scientific studies have been done to determine *optimum (desired) boating densities*. These studies have primarily been conducted for lake environments, and no studies on recreational carrying capacity or optimum boating densities are known to have been conducted for marine/coastal environments.

Given the lack of a precedent marine recreational carrying capacity study, some assumptions have been made in conducting this recreational carrying capacity assessment. These are as follows:

1. The spatial constraints of an enclosed lake environment can be simulated in the marine environment, by setting a seaward boundary for the location.
2. The ranges of desired boating densities determined in lake based studies can be applied to marine locations, given that the activities are of a similar nature (e.g. fishing, water skiing, cruising, jet skiing etc.). These are presented in Table 3.1

3.3.2. Area suitable for Recreation

The area suitable for recreation in Montego Bay has been estimated using Satellite imagery of the area, and by setting the outer, seaward boundary for the area from at the 200m contour, coinciding as best as possible with the MBMP boundaries.

The water surface area within the determined study location is approximately 29,700,000 m². The non-usable area of water has been estimated to be 14,800,000 m², and includes the shipping channel, reef areas, the Bogue Islands (the fish sanctuary), and a 100m coastal buffer to represent a swim-only and entrance/egress zone. This leaves an estimated 18,100,000 m² as water area usable for recreational purposes.

Table 3.2 Area Suitable for Recreation

	<i>Total Water Area (m²)</i>	<i>Non-usable area (m²)</i>	<i>Usable Area (m²)</i>
Bogue Lagoons	4,200,000	5,800,000	1,600,000
Montego Bay	11,000,000	3,700,000	7,300,000
Airport to Rose Hall	14,500,000	5,300,000	9,200,000

3.3.3. Desired Density & Recreational Boating Capacity

Based on some of the previous studies done (Table 3.1) to determine optimum densities for lake conditions, a desired density of 10 acres (40,500m²) of water surface per boat has been selected as a conservative, combined density for all types of boating activity.

Applying the equation for recreational carrying capacity (Section 3.2), the boating (vessel) capacity for Bogue Lagoon, Montego Bay and east of Montego Bay (airport to Rose Hall) have been calculated, and are presented in Table 3.3 following.

Table 3.3 Combined Use Vessel Carrying Capacity for Montego Bay- Study Area

	<i>Usable Water Area</i>	<i>Optimum Boating Density (combined use)</i>	<i>Carrying Capacity (CC) for combined use</i>
Bogue Lagoons	1,600,000	40,500m ² /vessel	39
Montego Bay	7,300,000	40,500m ² /vessel	180
Airport to Rose Hall	9,200,000	40,500m ² /vessel	227

Based on this calculation, the entire study area (out to the 200m depth contour) can accommodate a total of 446 motorized and non-motorised vessels combined, without compromising safe, recreational use, aesthetic enjoyment and/or environmental quality. This is well within the number of vessels that were observed in operation and berthed in the area, and greater than the number of vessels currently registered with the MAJ.

Based on the ecological sensitivity of the Bogue Lagoons it is suggested that the recreational use of the area should be limited to non-motorised activities and motorized vessels use the area only for entry, egress and berthing. In such a situation, a different optimum boating density of could be applied (4.5 acres or 18, 500m²/vessel). The non-motorised vessel carrying capacity for the Bogue Lagoons would then be 86.

3.3.4. Constraints

As mentioned previously, recreational carrying capacity is as much perception as it is science. The determination of the carrying capacity for water vessels in Montego Bay was done based on the assumptions presented in Section 3.3.1, and with several constraints. These include:

- **The short duration of the study period.** The single field observation (two days) facilitated through this study does not allow for a true assessment of vessel use patterns or density over time. No comparison can be made between the average use periods and the peak use periods.
- **The lack of site-specific user information.** Without the conduct of a ‘perception’ survey, there is no way to truly develop a site-specific optimum boating density for Montego Bay. The social survey designed into this study is a marketing survey and addresses more the watersports market profile, and not so

much the perceptions. Furthermore, this social survey is too small a sample size to develop a true picture of the user perceptions of safety and aesthetics on the water in Montego Bay.

Given these limitations to the carrying capacity assessment, the findings (vessel numbers) presented in Section 3.3.3 should be used as guides, and not definitive or finite figures.

A more comprehensive carrying capacity assessment could provide a location-specific study that would provide the necessary information on perception and actual use areas and patterns, and would therefore provide a more exact assessment of recreational vessel capacity in Montego Bay. The number of each type of vessel that could be accommodated based on demand and optimum density could then be determined, and used to further guide the licensing of watersporting activities. Such a study would require the following:

- Developing a profile of recreation users through on-site and mail surveys. This will enable the measurement of visitor expectations, perceptions of existing conditions, and satisfaction and opinions of shoreline management.
- Measuring recreation use patterns, with the aid of aerial and ground counts, over an extended period of time, to account for peak and low use periods.

4. Marketing Analysis

4.1. Background & Methodology

A marketing analysis was conducted in the study area in order to facilitate the determination of the following:

- The current level of participation in watersports in Montego Bay.
- Whether or not what was being offered in the watersports industry was what was in demand by visitors to the island.
- Whether or not the watersports operators were providing enough services to fill the needs of current and potential participants.
- Whether or not the quality of the watersports services offered made Jamaica a true competitor in the water sports industry.
- Whether or not there was space for improvement of watersports services and protection of marine and riverine areas through regulation.
- What marketing strategies would be useful in encouraging interest in Jamaica as a water sport destination?

In conducting the market survey, a questionnaire was drawn up, with emphasis placed on obtaining the views of participants in watersport activities in Montego Bay. Independent, non-focused interviews were conducted with watersport operators and stakeholders in the focus areas to get a feel for the context within which the data was being gathered.

A questionnaire consisting of 11 questions was developed, some of which were split into 2 or more sections, using the objectives of the study as a guideline. With consideration of the expected unwillingness of tourists to spend vacation times completing a lengthy survey more closed-ended than open-ended questions were included. The questionnaires contained 4 biographical questions, and 7 others geared towards gleaning information on the above bullet points. A copy of the survey instrument is presented in Appendix I.

The questionnaire was pilot tested among foreign nationals residing in Jamaica and who frequently participate in watersports, to test its level of 'user-friendliness'/appropriateness, inclusive of:

- logical sequencing of questions;
- ease of comprehension of questions and instructions; and
- possible resistance to unforeseen implications of questions.

A two (2) person team implemented the surveys in Montego Bay. Respondents were approached randomly in the vicinity of water sports facilities, and were screened only to see if they had already participated in watersports while in Jamaica. The researchers were not required to survey tourists only.

The research was conducted over the course of 3 days (Friday to Sunday) in the third week of July. It was discovered that neither early mornings nor late evenings were conducive to questioning tourists, so surveying began in the late morning, and finished up in the late afternoon. In each location, the 2 team members met first with their gatekeepers and discussed the fundamentals of the project with each. At the hotels, the 'playmakers' and watersports operators were advised that we would be seen speaking to guests at the hotel, and in the event that any of the guests were concerned, to indicate that we had the support of the hotel management and staff.

A total of 63 questionnaires were returned in Montego Bay.

The Jamaica Tourist Board's official list of licensed watersports operators was used to assist in the identification of water sports operators in the defined locations.

4.1.1. Constraints

- Tourists generally are not willing to spend the time to complete surveys when it interferes with their activities. With this questionnaire, it was important to visit the guest just before or after a water sport activity was undertaken or as was the case in Montego Bay while they were on or around the beach area.
- As a result of the above many of the questionnaires were hurriedly completed and the data shows that many of the questions were not answered, resulting in a high percentage of data with "no response".
- Some answers could not be processed as respondents clearly did not read the questions e.g. question 8 which ask for a list of "activities pursued in Jamaica" persons listed activities pursued in Mexico, the Dominican Republic and The Netherlands.

4.2.S.W.O.T. Analysis

Montego Bay, also referred to as the second city, has remained a popular resort area. One of the major tourism advantages of the city is its international airport and the associated access to direct flights to major towns of the U.S., United Kingdom and Canada.

Its beaches, exclusive restaurants, nightclubs and daytime recreation lend themselves to a good mix for vacationers. The varying types of accommodation available also cater to the needs of many types of tourists. There are also several hotels in the area which have facilities required for hosting conferences, catering to both the business and pleasure traveler.

The area offers a wide range of water activities including windsurfing, kayaking, parasailing and cruises- both daytime and romantic sunset trips. Glass bottom boat rides, pedal boats, banana boats, wakeboarding and water skiing are available. The underwater activities e.g. snorkeling and SCUBA diving are very popular with visitors. For the more adventurous jet skis/wave runners are a popular choice. Also available is

deep sea fishing, the “semi submarine” tour as well as the “sea trek” available from one of the attraction providers in the area.

Strengths
<ul style="list-style-type: none">▪ The availability of a wide range of watersport products.▪ Large number of rooms available to the market.▪ The quality of customer service offered by providers of the products as stated by the person participating in the survey.▪ The variety of daytime and nighttime activities offered.▪ The presence of the international airport▪ The varied landscape and seascape.
Weaknesses
<ul style="list-style-type: none">▪ Marine Park is not as functional as it should be. The reproduction of fish for the area should be a priority at this time. The sinking of a ship would be very beneficial in achieving this aim.▪ Watersporting activities not adequately policed.▪ The high cost of licenses is seen by the operators as exorbitant, and the licensing process is seen to be tedious.
Opportunities
<ul style="list-style-type: none">▪ Up-coming expansion of room count in the area, will see a larger market partaking in the sport.▪ The increase in investment/job opportunities associated with the current hotel developments will be beneficial.
Threats
<ul style="list-style-type: none">▪ The rapid deterioration of fish life, reefs and seagrass beds is impacting negatively on the quality of the experience while snorkeling and scuba diving.▪ Limitation in provision of swimming areas needs to be addressed.▪ Deterioration of the water quality as a result of pollution.

4.3. Findings of User Survey

The main findings of the marketing survey implemented under this study for the Montego Bay area have been presented below. As previously mentioned, some of the surveys returned did not have responses to all of the questions, and so, in some instances there are percentages representing ‘did not indicate’. All the percentages have been rounded to the nearest whole number.

4.3.1. Market Profile

Nationality	
<ul style="list-style-type: none"> ▪ British 13% ▪ American 10% ▪ Japanese 5% ▪ Jamaican 5% ▪ Canadian 5% ▪ Italian 2% ▪ German 2% ▪ 58% did not indicate their nationality 	
Gender	
<ul style="list-style-type: none"> ▪ Male 46% ▪ Female 54% 	
Age Group	
<ul style="list-style-type: none"> ▪ Ages 36-45 29% ▪ Ages 26-35 25% ▪ Ages 16-25 24% ▪ 22% did not indicate their age range. 	
Type of Room Plan	
<ul style="list-style-type: none"> ▪ All-inclusive - 54%, ▪ European Plan - 21% ▪ Other (include bed and breakfast) - 14%. <p>11% of persons participating in the survey did not indicate the type of package they purchased while visiting the area.</p> <ul style="list-style-type: none"> ▪ 70% of the respondents stated that they were repeat visitors ▪ 27% of them were first time visitors to the Island ▪ 3% did not indicate 	
Motivation/Attitude	

In Montego Bay, only 13% of the participants in the survey indicated that they chose Jamaica because of the availability of water sports. The majority of the visitors came to Jamaica as a result of the scenery/environment (33%), followed by culture (28%) and due to advertising and recommendations (27%).

The data indicates that 57% of the persons surveyed chose destinations that cater to their preferred water sport activities.

4.3.2. Analysis of Findings

Travel Time To Participate In A Water Sport

The range of time that respondents were willing to travel to participate in an activity was centered between 15 to 30 minutes. The breakdown of the percentages is as follows:

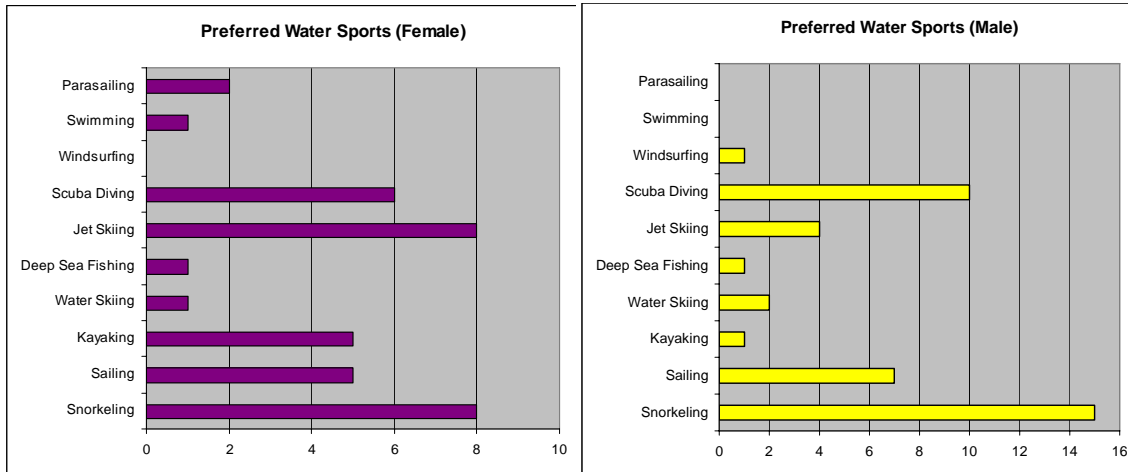
- 21% would travel for a maximum of 15 minutes
- 37% would travel for a maximum of 30 minutes
- 14% would travel for a maximum of 1 hour
- 17% would travel for more than an hour
- 11% did not indicate to time willing to travel

Preferred Water Sports By Gender

Respondents were allowed to indicate more than one type of water sport as their preferred choice.

The most popular water sports for women were snorkeling and jet skiing, followed by scuba diving then kayaking and sailing.

The most popular water sport for men was snorkeling, followed by scuba diving then jet skiing and sailing.



Environmental Awareness

An overwhelming majority of the persons (95%) completing the questionnaires stated that they consider themselves to be environmentally conscious. Only 3% stated that they do not describe themselves as being environmentally conscious. 2% were neutral.

Of the 95% referred to above, 89% would be either very or extremely supportive of regulations which may restrict their sporting activity but protect the Jamaican environment.

Length of Stay

The majority of customers surveyed indicated that most (82%) were on a trip which would last from 5 nights to more than 7 nights. When this figure is cross referenced with customers who chose Jamaica as a destination as a result of the watersports available, we found that only 18% of the respondents indicated that this was the case.

- 43% of participants were on a visit between 5-7 nights
- 39% were on a visit lasting more than 7 nights
- 10% were on a visit of 4 nights or less
- 8% of persons participating in the survey did not indicate their length of stay

4.4. Market Size & Potential for Growth

The total number of stopover visitors for 2004 was 430,908 or 30.5% of total market share. The corresponding figure for 2003 is 30.9 % of market share or 412,274 stopovers.

There is a range of accommodation offered in Montego Bay, as presented following.

	Units				Rooms			
	2000	2001	2002	2003	2000	2001	2002	2003
<50 rooms	29	29	29	28	774	784	788	752
51 - 100	10	9	9	10	765	696	696	756
101 - 200	7	7	7	7	995	995	995	995
>200 rooms	8	9	9	10	3,155	3,374	3,374	3,375
Total Hotel	54	54	54	55	5,689	5,849	5,853	5,878
Guest Houses								
	74	74	74	76	540	530	530	543
Resort Villas								
	373	385	385	387	1,318	1,359	1,359	1,376
Apartments								
	30	11	11	11	426	223	223	223
TOTAL	531	524	524	528	7,973	7,961	7,965	8,019

- Source: JTB Tourism Statistics 2003 Table 25
- The Jamaica Tourist Board in consultation with the Tourism Product Development Co. has removed some accommodation from the current listing because they either have remained closed over an extended period of time or are no longer being used as a tourist accommodation.
- The Guesthouse accommodation category since 2001 includes properties that offer Bed & Breakfast facilities.

There is a considerable amount of expansion slated for this area in terms of construction of rooms and hence the provision of adequate activities to supplement and enhance a visitor's experience while on the island. The potential growth for this sub-sector is therefore due for expansion so as to meet the demand of visitors.

4.5. Watersports - Competition for Jamaica

Jamaica is subject to competition from within and from other destinations. Within the Jamaican market, competition is primarily between the marketing regions. There has been a marked difference in the water sporting needs of visitors to the island within the last twenty (20) years. Client expectations have shifted from the glass bottom boat rides, snorkeling and diving and now include Aqua-cycles, Hobie cats, Jet-skis/Wave runners and Para-sailing. Independent water sports operators are a "dying breed" since the larger (all-inclusive) resorts commenced operating water sporting facilities rather than outsourcing the department to sub-contractors. Initially, these independent water sports operators would use the resort as a base and were able to attract guests from villas, guest houses and smaller hotels. They are now however, marketing and selling the same products which are now already included in the all-inclusive packages. Independent operators concentrated on niche marketing at dive shows instead of one of the numerous offerings of an all-inclusive package.

Since January 2005, the Sandals chain has moved away from including SCUBA diving in the package. The once included Resort training (Introduction to SCUBA) is now available at a surcharge (US\$70 per person) with an additional US\$180 for persons wishing to be certified internationally (PADI). Of note, is the fact that one of their resorts has experienced a thirty percent (30%) increase in persons taking the certification course. Currently this resort offers between three (3) to five (5) dives per day in addition to training dives and the increasingly popular night dives. A maximum number of certified divers who this resort takes out daily are 15 - 20 persons. The increased growth in demand is most likely due to increased promotion/marketing of this revenue earner on resort by resort personnel.

Turks and Caicos, the ABC islands (Aruba, Bonaire, Curacao), the Cayman Islands, Cancun and St Lucia are five (5) of the primary regional destinations. Turks and Caicos' development is primarily due to watersporting (SCUBA diving in particular). The ABC islands and Cancun also heavily market watersports as their primary attraction. A local Dive Operator with over 20 years diving is of the view that the offerings of the above referenced destinations pale in comparison to the wonders to be seen in Jamaica's waters. Most lack variety and safety requirements are lacking.

4.5.1. Key Success Factors

The following factors would be essential to any efforts to effectively market Jamaica as a water sport destination:

- Effectively segment the tourism market and target water sporting enthusiasts
- Position Jamaica as a choice water sport destination offering a variety of water sporting activities blended with culture and eco-tourism
- Educate and change the mind-set of local stakeholders to the benefits of sustainable tourism development

4.5.2. Critical Issues

Tourism is the world's largest industry with nature-tourism its fastest growing sector. The possibility of watersport developing as another niche market for Jamaica's tourism is encouraging. Environmental degradation and pollution, harassment, limited growth potential due to space limitations in marine traffic areas, inadequate and insufficient support systems, and lack of enforcement of regulations have been cited as critical factors which could negatively impact this development.

Jamaica as a destination is still considered one the most exciting within the Caribbean. The combination of climate, geography, culture and activities provides strong competitive advantage over the destinations (in the Caribbean). The perception of crime is the significant drawback.

To ensure a viable product, a clear and concise marketing strategy must be developed which addresses these critical issues.

With the proper marketing, there is potential for watersports to grow as another niche market in Jamaica.

4.5.3. Macro-Environment

Sociological -World wide, values are constantly changing among different population sectors. Across sectors, people are seeking a better quality of life and self-reliance. Populations are aging as a result of improved health and declining birth rates and trends indicate significant changes in family structure. These changes have brought about adjustments in the process of acquiring customers and how customers close purchase decisions.

Economical - Jamaica is a key member of the Caribbean Common market (CARICOM), which is strategically located 1,000 miles from the United States of America (USA), the world's richest market place. The economic policies of Jamaica encourage foreign investment in areas that earn or save foreign exchange, generate employment and use local raw materials. The government provides a wide range of incentives to investors, including remittance facilities to assist in repatriating funds to the country of origin; tax holidays which defer taxes for a period of years; and duty-free access for machinery and raw materials imported for approved enterprises. (www.investjamaica.com).

The recent granting of approved tourist destination to Jamaica by China (February 2005) will facilitate a development of China's outbound tourist market while ultimately reducing the island's dependence on the more traditional markets (namely USA which presently accounts for 72% of visitors to the island).

For example, the current development of the West Harbour in Port Antonio has now created modern facilities for the boating and sailing fraternity. This coupled with the proposed development of a ferry system to facilitate large cruise ship stops in Port Antonio will ensure that Port Antonio will be on the itineraries of the ever-expanding market of recreational boating. (www.portland-coc.org). This can be the catalyst to Jamaica, and specifically Portland regaining its position of a top Caribbean exclusive destination.

Political - Jamaica has one of the most stable democracies in the world. This is important especially to a sector such as tourism. A stable political environment will encourage investment by both local and foreign investors. It means also that there is little risk of visitors being caught in the middle of any political unrest.

Regulatory - The island boasts a most liberal and modern regulatory environment in the western hemisphere. There are not constraints to capital flows in and out of the country as exchange controls have been removed and the net international reserve is in a strong position. Tough legislation has also been implemented to protect the integrity of the country's financial system. These measures have the full endorsement of multilateral and rating agencies as well as the private capital markets. (www.investjamaica.com).

5. Summary of Findings & Recommendations

5.1. Watersports Capacity, Safety & Zoning

Based on the findings of the capacity assessment, the entire study area (out to the 200m depth contour) can accommodate a total of 446 motorized and non-motorised vessels combined, without compromising safe, recreational use, aesthetic enjoyment and/or environmental quality. This is well within the number of vessels that were observed in operation and berthed in the area, and greater than the number of vessels currently registered with the MAJ.

Given the extent of the area and the relatively limited number of vessels known to use the entire study area, there are no eminent safety concerns. General safety procedures and rules of the water were observed in most instances. Nonetheless, an item of concern for the entire area is the large percentage (50%) of reported incidents which involve jet skis.

There is presently no formal use zoning for the area in relation to watersports, although there is a zoning plan for the MBMP. The generally safe watersporting practices in Montego Bay could be affected if there is an increase in the watersports activities in the area without the implementation of a zoning plan and a management approach to the use of vessels in the area.

5.2. Environmental Concerns

There are several sources of pollution along the entire coastline of the study area, which are of substantial concern to the environmental integrity of the area. Sources of pollution include land-based as well as boat/ship generated wastes. Furthermore, there are no haul-out and designated maintenance facilities, no pump-out facilities for vessels in Montego-Bay, and very limited options for safely refueling boats. In general, there is a severe lack of support services and facilities for the water sports and boating industry in Montego Bay and this poses a threat to the marine and coastal environment as well as the future expansion of the industry.

5.3. Recommendations

5.3.1. Zoning

Use zoning of the area should be formalized, to take into consideration the shipping channel in the Montego Bay harbour, and the ecologically sensitive areas around the reefs and in particular in the Bogue Lagoons. Motorised activities in the lagoons should be restricted to entry, egress and berthing, and recreational activities should therefore be limited to the use of non-motorised vessels. The area is already zoned as a fish sanctuary.

The final zoning of the area should take into consideration the following:

1. Appropriate swimming areas (depth, current and wave conditions).
2. Suitable areas for non-mechanised recreational activities (access and wave conditions).
3. Suitable areas for mechanized recreational activities (according to type).
4. Locations for the entrance and egress of vessels to shore.
5. The ISPS Code for Port Security.
6. Fishing areas and Fish Nursery Areas.
7. Mooring and berthing needs.

More specifically, the following should be considered for the Montego Bay Area, and adherence to same could be stated as requirements of watersports licenses:

- Bathing areas should be clearly marked, using a standardized buoy system. This would provide a visual indication to water craft and bathers as to the distinction between appropriate uses. Aesthetics should be considered in the determination of the buoy systems.
- Entrance and egress channels should be clearly marked, using a standardized buoy system.
- Specific areas should be designated for the use of jet skis.
- Offshore snorkeling tours should ensure that the snorkellers can be clearly seen by passing vessels, and accounted for by the tour vessel.
- The existing MBMP mooring buoys should be maintained and further installation of buoys be done as necessary in typical anchorage areas (including those outside of the MBMP), to prevent the ad hoc anchorage of vessels. This is particularly important at dive sites.

5.3.2. General Safety & Environmental Management

While there were no blatant safety problems noted during the field observations for this study, the reported incidents in the area as well as the possible expansion of the watersports offerings require that the following safety and environmental matters be considered:

- Mooring should only be allowed in designated areas. This may be accomplished through requirements in both the Beach Licences and the Tourism Licences.
- Jet driven vessels (no propellers) should be considered for the tow vessels for Banana Boats etc.
- Refueling on the beach should be stopped in favor of refueling some distance toward the back of the beach. Proper equipment such as funnels and containment supplies need to be used. This should be included in the tourism licence given to operators.

- A formal, proper refueling alternative such as particular fuel ‘depots’ be established in each of the major areas.

Additionally, the MBMP Trust needs to be supported in its mandate of enforcement of the Marine Park Regulations and associated project and initiatives. Given the past and present financial constraints facing the MBMP Trust, consideration should be given to expanding the boundaries of the MBMP towards the east, so as to incorporate the tourism interests towards Rose Hall. Support for the MBMP from the tourism sector in this area of Montego Bay may prove to be beneficial to the MBMP Trust, the tourism facilities in that area, and for the Montego Bay marine and coastal environment in general.

5.3.3. Licensing

In order to promote safe and environmentally-friendly watersports operations, the following recommendations are made with respect to the licensing for the industry:

- Soliciting by showing the vessel on the sea should not be allowed and rentals should only be effected from designated areas where there are suitable channels (particularly for jet skis). Put a condition on watersports license for no-solicitation using vessels.
- Establish entry/egress channels, and where relevant watersport licences should make reference to the use of these lanes.
- The beach licensing system should be updated for a number of standardized specifications (buoy size, colour, spacing and anchoring). The conditions of the Beach Licences could be amended to enact this recommendation.

It should be noted that all the recommendations for the improved safety and environmental integrity of watersports operations in the area require systems for monitoring and enforcement. The legal implications of these recommendations will be further discussed in the final report for the overall *Carrying Capacity & Safety in Marine Recreational Areas Study*.

5.3.4. National Marketing Strategy

Marketing Objectives

- Establish Jamaica as a choice destination for water sporting
- Provide world class facilities (direct and support)
- Achieve sustainability through effective regulations and enforcing of same

The priority is to establish Jamaica as a leading water sport destination while capturing the uniqueness of each resort area.

Segmentation & Target Market

Age: 25 - 54 years old

Gender: Male and Female

Ethnic Origin: Multinational - Jamaican, North American, Europeans, and Asian

The intention is to pursue a niche marketing strategy. Our research has shown that persons will travel for water sport in combination with other appealing factors. The diversity of Jamaica's culture and geography will play a key role in the decision made for the final venue on island.

Perceptual Positioning & Distribution

Promotional and advertising material ought to reflect the variety and range of water sporting activities available based on resort destination. The appeal will be directly to the water sports enthusiast love for this particular sporting activity in different sections of the same island.

The distribution channels will be the traditional channels of the tour operator/wholesaler, the travel agencies, direct through consumer shows and the Internet. Familiarization tours by travel agents and tour operators of the various water sport facilities are encouraged. Press releases on newsworthy items will be circulated (such as *National Geographic* recently published a photograph taken here in Jamaica of a Black shark on top of a Spotted Eagle Ray). Word-of-mouth advertising and client retention programs will provide secondary support.

General Recommendations to support marketing

- Closer monitoring of the use of marine traffic areas in all resort areas.
- Decompression chamber required in (at least) one other resort area.
- Introduction of other water sport activities to cater to the wide cross section of consumers (such as underwater trekking, submarine underwater tour, wake boarding, surfing, Regattas (in selected areas)
- Strict regulation (with severe penalties) to reduce and/or control the effects of pollution and environmental degradation.
- Encourage investment in support systems in areas where the need has been identified.

6. References

- Chilman, K. et al. Evolving Concepts of Recreational Carrying Capacity. January 20, 2005. <http://www.prr.msu.edu/trends2000/pdf/chilmanCC.pdf>.
- Jackson, R., M.D. Buszynski and D. Botting. 1989. Carrying Capacity and lake recreation planning. The Michigan Riparian, November 1989, pp. 11-12, 14.
- Jamaica Information Service www.jis.gov.jm
- Jamaica Promotions Corporation www.investjamaica.com
- Jamaica Tourist Board, Tourism Statistics 2003.
- Mahoney, E.M and D.J. Stynbes. 1995. Recreational Boating Carrying Capacity: A Framework for Managing Inland Lakes. East Lansing, MI: Department of Park, Recreation and Tourism Resources, Michigan State University.
- Manning, R. 1985. Studies in outdoor recreation: Search for Satisfaction. Corvallis, OR: Oregon State University Press.
- Montego Bay Marine Park www.mbmp.org
- Progressive AE, 2001. Four Township Recreational Carrying Capacity Study. Prepared for Four Township Water Resources Council, Inc. Project No.: 51830106
- Warren, R. and P. Rea. 1989. Management of Aquatic Recreation Resources. NCSU. Publishing Horizons, Inc. Columbus, Ohio.

Appendix I

Water Sports Questionnaire

WE ARE GATHERING INFORMATION ON WATER SPORT ACTIVITIES IN JAMAICA, AND WOULD GREATLY APPRECIATE YOUR HELP IN COMPLETING THE FOLLOWING SHORT QUESTIONNAIRE. THIS WILL HELP TO IMPROVE THE QUALITY OF ACTIVITIES OFFERED HERE.

Please tick [✓] the dialogue boxes which agree with your answer. Otherwise, write your answer in the space provided.

1. Are you: male female

2. Please indicate the age group to which you belong:

under 15 16 - 25 26 - 35 36 - 45 46 - 55 over 56

3a. Nationality: -----

3b. Country of Residence: -----

3c. If you are not Jamaican, is this the first time you have been to Jamaica? yes no

3d. Why did you choose Jamaica as your travel destination? (*Select as many answers as are correct for you*)

advertising/recommendation culture (art, music, cuisine) scenery/environment water sports

other (please state _____)

(If you live in Jamaica, please omit questions 3e and 3f, and go directly to question 4)

3e. As a visitor, what type of package are you using?

- European Plan (room only) All-inclusive (room, meals, drinks) Other (Please state: _____)

3f. What is the length of your current visit?

- 4 nights or less 5 - 7 nights more than 7 nights

4. Please state the type of water sports you enjoy. *(Do not state any activity you have not taken part in within the last 3 years.)*

5. Do you choose destinations that cater to your preferred water sport activities? yes no

6. While on your visit, how long would you travel to take a part in a water sport?

- 15 minutes 30 minutes 1 hour more than 1 hour

7a. Do you consider yourself to be environmentally conscious? yes no

7b. How supportive are you of regulations which may restrict your water sport activities, but protect the Jamaican environment?

- extremely very neither for nor against a little not at all

8. Please list the water sports you have pursued while in Jamaica.

Please refer only to water sport activities in which you have participated within the last 3 years. Rate each sport as indicated in the table below, using the values: 5 = high, 4 = very good, 3 = acceptable, 2 = low, 1 = non-existent. In the last column, circle the appropriate answer.

TYPE OF WATER SPORT	LOCATION	OVERALL SAFETY	OVERALL MAINTAINANCE OF THE FACILITIES	YOUR COMFORT WITH EQUIPMENT	COMPETENCE OF OPERATORS	CUSTOMER SERVICE	ACCESSIBILITY	VALUE FOR MONEY	INTEREST IN REPEATING ACTIVITY
									Yes/No
									Yes/No
									Yes/No
									Yes/No
									Yes/No
									Yes/No

9a. Is there anything you were particularly dissatisfied with? yes no

9b. If yes, please state:-----

10a. Is there anything you were particularly satisfied with? yes no

10b. If yes, please state:-----

11. Do you have any recommendations regarding water sport activities in Jamaica? (*suggestions for improvement, types of activities, etcetera*) -----

Water Sports Questionnaire

WE ARE GATHERING INFORMATION ON WATER SPORT ACTIVITIES IN JAMAICA, AND WOULD GREATLY APPRECIATE YOUR HELP IN COMPLETING THE FOLLOWING SHORT QUESTIONNAIRE. THIS WILL HELP TO IMPROVE THE QUALITY OF ACTIVITIES OFFERED HERE.

Please tick [✓] the dialogue boxes which agree with your answer. Otherwise, write your answer in the space provided.

1. Are you: male female

2. Please indicate the age group to which you belong:

under 15 16 – 25 26 – 35 36 – 45 46 – 55 over 56

3a. Nationality: -----

3b. Country of Residence: -----

3c. If you are not Jamaican, is this the first time you have been to Jamaica? yes no

3d. Why did you choose Jamaica as your travel destination? (*Select as many answers as are correct for you*)

advertising/recommendation culture (art, music, cuisine) scenery/environment water sports
 other (please state _____)

(If you live in Jamaica, please omit questions 3e and 3f, and go directly to question 4)

3e. As a visitor, what type of package are you using?

European Plan (room only) All-inclusive (room, meals, drinks) Other (Please state: _____)

3f. What is the length of your current visit?

4 nights or less 5 – 7 nights more than 7 nights

4. Please state the type of water sports you enjoy. (*Do not state any activity you have not taken part in within the last 3 years.*)

THANK YOU FOR YOUR TIME AND HELP

5. Do you choose destinations that cater to your preferred water sport activities? yes no

6. While on your visit, how long would you travel to take a part in a water sport?
 15 minutes 30 minutes 1 hour more than 1 hour

7a. Do you consider yourself to be environmentally conscious? yes no

7b. How supportive are you of regulations which may restrict your water sport activities, but protect the Jamaican environment?
 extremely very neither for nor against a little not at all

8. Please list the water sports you have pursued while in Jamaica.
Please refer only to water sport activities in which you have participated within the last 3 years. Rate each sport as indicated in the table below, using the values: 5 = high, 4 = very good, 3 = acceptable, 2 = low, 1 = non-existent. In the last column, circle the appropriate answer.

TYPE OF WATER SPORT	LOCATION	OVERALL SAFETY	OVERALL MAINTAINANCE OF THE FACILITIES	YOUR COMFORT WITH EQUIPMENT	COMPETENCE OF OPERATORS	CUSTOMER SERVICE	ACCESSIBILITY	VALUE FOR MONEY	INTEREST IN REPEATING ACTIVITY
									Yes/No
									Yes/No
									Yes/No
									Yes/No
									Yes/No
									Yes/No

THANK YOU FOR YOUR TIME AND HELP

9a. Is there anything you were particularly dissatisfied with? yes no

9b. If yes, please state:-----

10a. Is there anything you were particularly satisfied with? yes no

10b. If yes, please state:-----

11. Do you have any recommendations regarding water sport activities in Jamaica? (*suggestions for improvement, types of activities, etcetera*) -----

