Recreational Carrying Capacity Assessment for Negril

Submitted to the

Tourism Product Development Company Ltd.

SMITH WARNER INTERNATIONAL
COASTAL & ENVIRONMENTAL ENGINEERING

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1. Introduction

1.1. Project Background

With the growing number of visitors to Jamaica over the past decades, 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. The growth of the watersports industry, along with improvements in boating technology (with faster water vessels) has also impacted negatively on visitor safety on the water. While many watersport-related incidents are apparently not recorded, there are several reported accidents a year. In fact, for the period January 2001 to December 2004, 56 watersport-related incidents were reported to the Jamaica Tourist Board (an average of 14 per year), including six fatalities. This obviously has the potential to negatively impact the tourism industry.

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 watersporting activities, and wish 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 this overall capacity and safety study. These are:

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 requires 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.

1.3. Document Objectives

This document conveys the findings and recommendations for one of the six locations studied, *Negril*. The information presented in this report has been obtained through desk review, and field investigations[1], and is offered to assist decision-makers in formulating policies and regulations to ensure safety and environmental health in Negril. 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 Negril.

This report addresses the following:

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

[1] Site visits made between February 18 and 20, 2005.

2. Site Description – Negril

2.1. General Description

Located on the western tip of Jamaica, Negril is one the island's largest resort areas, spanning approximately 8.5km of shoreline. The main tourism-related activities in Negril take place along the two major bays, Long Bay and Bloody Bay, and along the western rocky shores known as the West End.

For the purpose of this study, the areas considered include Bloody Bay, Rutland Point, Booby Cay and Long Bay, ending at the South Negril River (Figure 2.1).

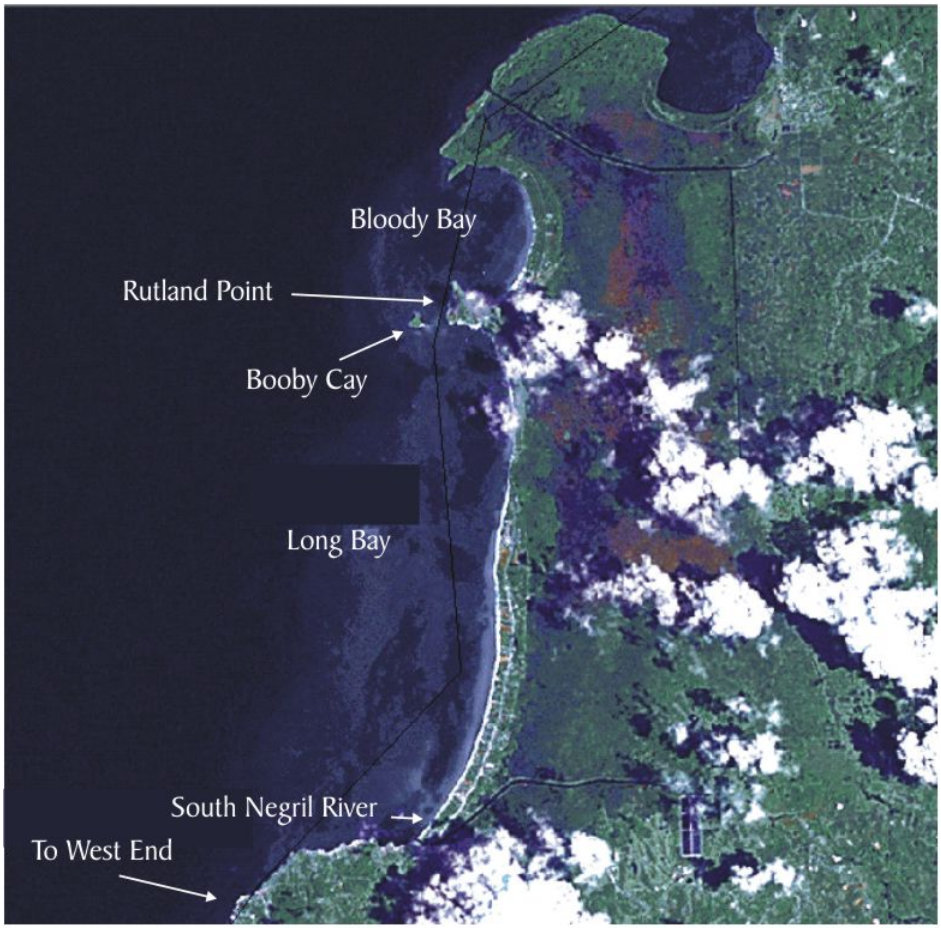


Figure 2.1 Study Area

2.1.1. Negril Marine Park – Zoning Plan

The study area falls within the Negril Environmental Protection Area (EPA) and the Negril Marine Park (NMP). The latter was established in 1998 under the Natural Resources Conservation Authority Act, 1991 (NRCA Act), and is managed by a Non-governmental organization (NGO), the Negril Coral Reef Preservation Society (NCRPS) through a delegation agreement with the NRCA.

The NMP covers 160 Km^2, and includes coral reef, seagrass and mangrove ecosystems among other important environmental attributes, and is a recognized multi-use area. Between 1995 and 2002 the NCRPS was active in developing a zoning plan for the NMP. Through public consultations and after government review, aspects of the existing zoning plan (Figure 2.2) were implemented. The plan shows that the park is divided into eight colour-coded zones differentiated according to use. Notably, the map indicates the delineation of a swimming zone (red), a non-motorised craft zone (orange) and a motorized craft zone (grey). Despite the development and partial implementation of this zoning plan, it is not yet legally regulated, and so there is no basis on which to enforce the use of the zones.

Between 1995 and 1998 the swimming zone was demarcated along Long Bay with 155 18-inch spherical buoys (white with a red band). These were placed approximately 300ft from shore, and at 150ft spacing. However, seaward of the swim zone there is no further visible zonation and all types of vessels use the area. In its original configuration the swimmers lane was broken by eleven entry points, which were strategically placed and intended to allow access of small craft to the beaches. However, due to a lack of maintenance and the passage of storms, several of these swim zone buoys and entry lanes have been lost, or are no longer evident. Recent conversations with NCRPS personnel revealed that an EFJ funded project will be addressing this deficiency. It is not clear what will occur beyond the life of the EFJ project with regards to the maintenance of the zoning markers and the enforcement of the use of the zones. The NCRPS needs a source of funds to maintain and enforce the zoning structure in the NMP.

2.2. *Water Sports Activities*

2.2.1. Nature and Extent of Watersports Activities

In addition to wading and swimming a wide range of watersports, involving both mechanized and non-mechanised vessels, occur within the two bays. The non-mechanized activities take place with the use of two main types of vessels:

- sailing vessels (hobie cat, wind surf, sun fish); and
- paddle vessels (kayaks, peddle boats, water tricycles).

The mechanized activities include:

- jet driven personal water craft (predominantly jet skis/waverunners);
- towed tours (parasail, banana ride, water skiing, wake boarding);
- SCUBA tours (requires use of a boat, the activity is not itself mechanized);
- cruising tours (glass bottom boats, party tours); and
- fishing tours.

Fishing and SCUBA tours also occur off the reefs in the deep sea.

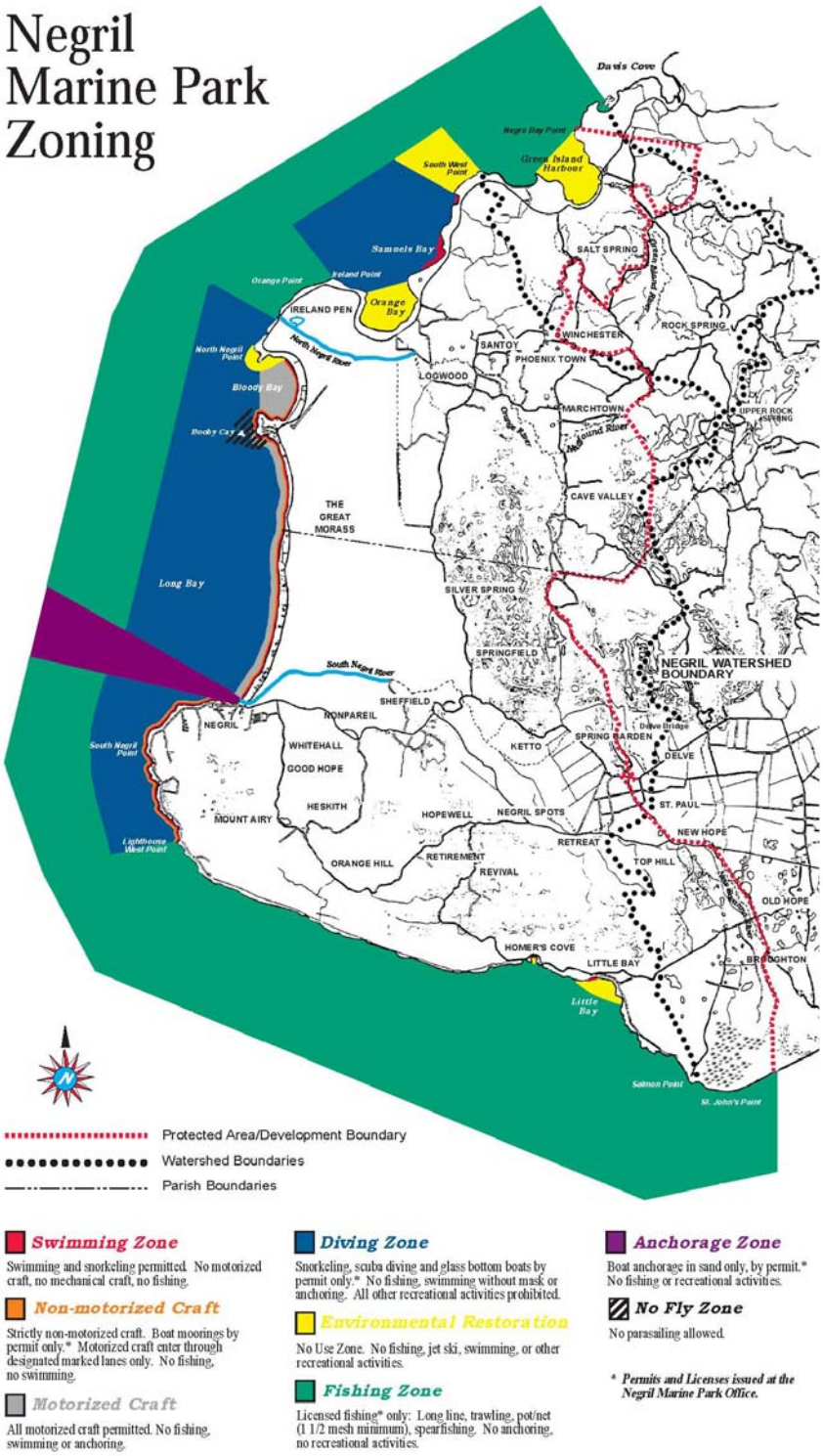


Figure 2.2 Negril Marine Park Zoning Plan

Swimming and wading

Swimmers use the swim zone generally but have a tendency to get as far away from the beach as possible. This results in the swimmers either being right on the edge of the zone or going outside of the zone, and in fact, some persons use the swim zone buoys to attach their sea rafts.

Non-mechanised activities

While ***sailing vessels*** are launched from the beach and traverse the shallow parts of the bay, the bulk of the activity normally occurs in deeper water or outside of the actual geographic bays.

Paddling vessels are launched from the beach and are generally used nearer to the shore with the possible exception of kayaks. Kayakers will conduct their trips out into the deeper water of the bays.

Mechanised activities

Cruising tours, such as glass bottom boats, operate where the water is shallow enough to view the sea floor from the boat and where there may be interesting things to be viewed. This limitation has these boats congregating on the shallow reefs around Booby Cay and those to the south (where snorkeling is also offered). Other cruising tours include party boats (catamarans). These vessels collect persons at certain points along the beach. The vessels then cruise the length of the coast some distance to sea and often stop at points of interest to allow snorkeling or swimming (at reefs in the bays or at the west end) and viewing of the sunset.

Waverunner rental is offered from six (6) locations along the beach from licensed operators. Waverunners are also available almost anywhere along the beach or at the borders of all-inclusive properties. There is no clear area in which the rides are confined nor is there any area that they do not operate in. While for the most part they are launched and make their return perpendicular to the shore at slow speeds, the rest of the 30 minute ride usually occurs at near the maximum operating speed. When the waverunners are outside of the swim zone, they tend to operate very close to the boundary of the swim zone and in a loose non-directional specific oval pattern in the middle of Long Bay and Bloody Bay.

Information obtained from interviews suggests that some of the unlicensed waverunners that operate in the study area travel into the study area from the north (from Orange Bay).




Towed tours show diversity in their usage of the sea space. The banana boat rides operate close to the swim zone and have a loose non-direction specific oval pattern which seems to include as part of normal operation the intentional toppling of passengers into the sea at the apex of turns. Wake boarding and skiing also show a loose oval pattern but with longer straight components and with much higher speeds. Parasail vessels either launch their tour from a raft anchored at sea or from self contained platforms. Parasail vessels tend to operate slightly further out to sea than other watersport vessels, but this distance varies. In addition, the velocity and pattern of the movement is varied, as in some instances the wind speed is such that the vessel does not have to go very fast to maintain the canopy.

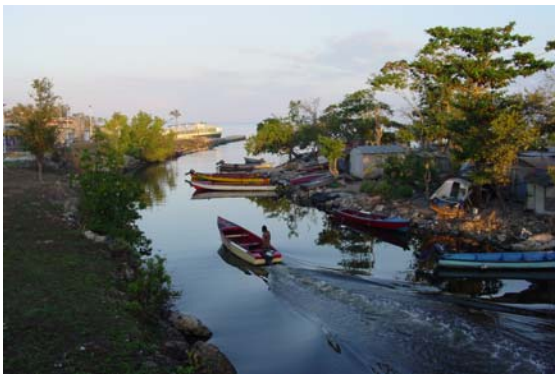

Fishing canoes and Sport Fishers usually depart prior to 10 a.m. and operate toward the deep edge of the reef and further out to deep sea respectively.

Dive boats depart from the all-inclusive properties in the north of Long Bay and from within Bloody Bay. For the most part they travel directly to the deep edge of the reef and use the moorings at various dive sites. The hotel properties normally have two dives per day (9-10 a.m. and 2-3 p.m.), although training dives may occur outside of these times and in shallower waters.

Berthing and storage

The South Negril River serves as safe harbour and daily berthing area for fiberglass canoes, glass bottom boats and small power boats. Draft conditions limit access to small vessels. Generally, there is a movement of vessels, especially glass bottom boats, out of the river at about 8-10 a.m. and they proceed northwards to their operating patterns.

Waverunners are stored on the beach adjacent to the watersports office or beside any structure on the property that provides the base of operation. In the mornings they are moved on trolleys to the waters edge.



2.2.2. Watersports Operators

Information provided by TPDCo indicates that there are 39 licensed watersports operators in the Negril area. During the site visits it was not always possible to distinguish between the licensed and un-licensed operators, nor was it possible to determine the exact number of operators, as some operators apparently had several persons acting on their behalf. However, it was apparent that there are more than 39 operations offering watersport in Long Bay and Bloody Bay combined.

2.2.3. Water Vessels

Observations made in the early morning revealed that there are 142 motorised vessels that are kept overnight in the area. The vessels observed were either berthed, anchored or on the land at the South Negril River, Long Bay, or Bloody Bay (Table 2.1, Details in Appendix I).

Information provided by the MAJ indicates that there are 120 motorized vessels licensed for tourism in Negril, and the data provided by the Fisheries Division indicates that there are 11 fishing vessels registered in Negril. According to these sources there are therefore 131 registered motorized vessels is Negril.

Table 2.1 Number of Motorised Vessels that 'Overnight' in the Study Area

Vessel Type	*Number*
Waverunners	37
Glass Bottom	34
Fibreglass canoe	32
Power Boat Misc.	13
Yachts and Catamarans	9
Parasail	5
Ski Boat	4
Dive Boat	4
Sport Fisher	3
Jet ski	1
Total	**142**

No estimate was made of the total number of non-motorized vessels in the study area as some of them are stowed out of sight. The MAJ has 205 non-motorised vessels registered for tourism in Negril. It is believed that the majority of the non-motorized vessels observed are licensed as most operate out of the large hotels and from the formal water sport operators.

Observations were also made throughout the day to estimate the number of vessels that actively use the study area. These observations involved several vessel counts, using binoculars to identify the types and numbers of vessels in use within a five-minute period.

A summary of the maximum number of vessels observed at any one time in a five-minute 'window' is presented in Table 2.2 following. The details of these boat counts are presented in Appendix I. It should be noted that the number of vessels observed does not in any way indicate the proximity in which they operate, nor does it suggest the actual density of the vessels (number of vessels per unit area at a given time). As such, it does not convey the chaos that often prevails in the proximity of the swim zone.

Table 2.2 Maximum number of vessels observed operating at the same time

	Maximum No. of Motorised Vessels	*Maximum No. of Non-Motorized Vessels*	*Maximum Total No. of vessels*
Long Bay	15	14	29
Bloody Bay	9	15	22
Reefs/Offshore	16	-	16

2.3.Maritime & Shoreline Safety

2.3.1. Maritime Safety

Despite the existence of a zoning plan and the demarcation of a swim area in Long Bay there are obvious concerns regarding personal safety in the water and with the use of watersport vessels. These issues range from adherence to standard boating practice to incompatible uses and congestion in the bays.

During the period January 2001 to December 2004 there were 18 reported watersports related incidents in Negril, of which two were fatal diving incidents. Approximately 70% of the reported incidents involved jet skis (13 of 18), and 60% of the Jet Ski accidents involved illegal operators (8 of 13). One licensed operator had vessels involved in 30% of the reported Jet Ski incidents (4 of 13).

Standard Boating Practice

There is mixed adherence to standard boating practice. Some vessels apparently show concern for the safe use of the water, while others seemingly have no regard for safety. Several of the motorized vessels travel at high speed in the vicinity of the swim zone, and in the presence of other moving vessels. Only some vessels were observed practicing slow, perpendicular entrance and egress, and there was also limited regard shown to the right of way for sailing vessels. The use of life jackets was evident, although there were occasions where neither agents nor clients were seen wearing life jackets. Discretion as to the age of jet ski/waverunner users was not applied, as waverunners were observed being operated by young persons.

The ingress and egress of vessels relative to the shore poses a particular problem as vessels have to travel through the swim zone. In the original configuration of the swim zone there were 11 channels installed to allow controlled ingress/egress of vessels from the shore. Due to inadequate maintenance, there are now only 4 identifiable channels (north of Merrils II, Fun Holiday, south of Chances, north of For Real and near Cosmos). It is understood from an interview with NCRPS personnel that an EFJ funded project will be addressing this deficiency. It is not clear what will occur beyond the life of the project.

General Use and Traffic Patterns

There were no distinct use patterns observed during the field assessment. The movement of the vessels in both bays appears to be sporadic and demand-driven. However, some trends as to the locations and times of operations were noted. For example, glass bottom tours tend to leave between 0800 and 1000 and head north and west towards the shallow reefs. Scuba operators head straight out to deeper reefs, and 'sunset' cruises head south towards the West End.

Apart from the demarcation of the swim zone, and the general respect shown for not conducting activities within the swim zone, there are no clear zones for the carrying out of particular activities. Both motorized and non-motorised activities take place together and in relative close proximity, within an area just outside of the swim zone.

During the assessment a clear case of the dangers posed by the multiple uses of the area was observed. A spear fisherman was nearly hit by a ski boat and then a jet ski in north

Long Bay on 20 Feb 2005. The fisherman was swimming over a dark area of sea and did not react to oncoming vessels. Generally, persons in the water outside of swim zones are at risk of being struck by vessels.

In addition and of note, is the fact that there is no comprehensive swim zone in Bloody Bay. The only area demarcated is in front of the all inclusive hotels. It was observed that some tourists and all the locals who use the area for bathing do so without the protection afforded by a visible barrier.

The practice of banana boats 'spilling' their passengers also poses a danger in the bay. This creates a situation where there are a number of persons in the water, which requires the vessel to make a close pass thereby creating the potential for collision. This also creates an obstruction to other vessels which might be in this heavily used area. Banana

boats are equipped with outboard motors which have propellers, which also poses a danger to the riders being collected from the water.

Additionally when vessels are not directly within the swim zone (seen to happen on several occasions with small craft, especially waverunners) they travel very close to the edge of the zone. This situation creates a real potential for collisions.

Watersport operators (licensed and unlicensed) have employees who solicit customers by traveling up and down the beach on foot or by traveling up and down the swim zones by vessel. Quite often they will park the vessel being offered in the swash zone of the beach or park it on the rope or bouys on the edge of/at the transgression into the swim zone. Approximately half of the Waverunner traffic observed was travel by the operator (or their agents) and traveling or 'showing' in order to solicit clients.

2.3.2. Rescue Boats

There are a number of dedicated rescue boats (with the words written on the hull). These tend to be either on trailers on the beach, anchored some distance out to sea, or anchored close to the beach. In most instances they were not manned nor did they have fuel on board. This indicates that they would not likely be able to quickly put to sea under power. Other rescue boats were seen underway moving up and down the bays. It is not clear if they were on patrol or simply being used as water taxis, although the latter appeared to be the likely scenario.

On at least two separate occasions where a non-mechanized vessel (hobie cat) overturned in the vicinity of Bloody Bay, assistance was received almost immediately by either a passing motor boat or by a motor boat sent from shore (i.e. a rescue). There seems to be a camaraderie existing within the watersport operator industry which sees assistance being rendered by any capable passerby.

The waverunners which seem to be unlicensed (no hull markings) and any waverunners which solicit along the beach pose a risk to customers purchasing rides. The unlicensed operators are not required to have a rescue boat, the licensed operators who venture up/down coast to solicit are away from their base of operation and thus away from the rescue boat. It has been observed that when the customer has exceeded the riding time sold, the operator has difficulty getting his attention from the beach and may not even have a vessel on standby to bring in a customer who has overstayed the ride.

2.3.3. Safety and Aesthetics on Land

A number of the hotel properties (such as the all-inclusives) and restaurants (such as Margaritaville) have installed prominent signs to inform their guests that the property does not offer watersport activities (or specific watersport activities) and that it is done at the visitors risk.

In addition to the swim zone there are several smaller areas which are demarked by hotel properties using small floats strung on ropes as is (or may be in certain cases) required by the Beach Control Act. These ropes terminate on the beach side with the ropes running up the beach face and a few feet up on the dry beach. These ropes may pose a tripping hazard for pedestrians walking along the beach.

Vessels are often anchored with a bow anchor in the sand (or a shallow ad hoc mooring) near to the shoreline during the day to facilitate the staging of the operation, loading of the vessel and to advertise the business. The vessels are normally anchored outside of, but near to, swimming zones. When vessels are anchored/moored close to the shoreline they use a bow anchor in the sand on the sea side and sometimes use a stern line which runs toward the beach and actually crosses the beach face. This creates an obstruction to the passage of pedestrians along the beach and provides a danger when the vessel moves up on a wave, creating a consequent rise in the rope lying across the beach face.

There are also a few moorings consisting of short lengths of rope and small floats installed on the foreshore of the beach. These are probably for mooring Waverunners during the day.

Vessels (such as hobie cats) are parked on the foreshore and immediately above the foreshore itself. These often cause an obstruction to pedestrians walking along the beach.

Furthermore, the proximity of several of the buildings to the shoreline poses a threat to safety of the buildings and life, particularly in the event of a natural disaster such as a hurricane.

2.4. Environmental Conditions

2.4.1. The Negril Marine Park

As mentioned in section 2.2 the study area falls within the NMP, a protected area of 160 square kilometers incorporating several important ecosystems including coral reefs, seagrass meadows and mangroves. The NMP also contains important fishing areas and fish nursery grounds. Over the past several decades there has been documented decline in the health of these ecosystems in Negril, and one of the main objectives of the NMP is to protect these natural coastal and marine resources. Activities within the park should be conducted with due consideration to the management objectives for the NMP.

2.4.2. The Caribbean Blue Flag Campaign

In November 2004, two (2) facilities in Negril were awarded Blue Flag certification. Both of these locations fall within the study areas for this project, and include:

- The Norman Manley Sea Park (Negril)
- Merril's Reort Beach (Negril)

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 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:

2. Water Quality
3. Environmental Education and Information
4. Environmental Management
5. 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.

2.4.3. Refueling

Refueling of small vessels (waverunners, ski boats, glass bottom boats etc) is carried out on the beach near to the sea, on the vessel which may be anchored near to the shore, and on the South Negril River. Additionally where the vessel uses mixed fuel (2 stroke oil and petrol) the mixing occurs on site. This involves carrying and floating a container with petrol out to the vessel and filling the vessels tank or inserting a fuel pickup into it while on the sea (or river). This has the potential to create pollution.

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:

Visitor Carrying Capacity = Area used by visitors ÷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:

Recreational Carrying Capacity = Area suitable for recreation ÷ 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 100acres suitable for recreation, and a desired boat density of 10acres/boat, the recreational carrying capacity is as follows:

Recreational Carrying Capacity = $100m^2 \div 10\ m^2$ boat = 10 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. A few of these are summarized in the Table 3.1.

Table 3.1 Summary of Optimum Boating Densities

Source	*Recommended Density*	*Uses Prescribed*
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 Negril

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 Negril has been estimated using the 1:50,000 (metric) topographic maps commissioned by the Government of Jamaica (1984) and the CYC Chart X, and by setting the outer, seaward boundary for the area from North Negril Point seaward approximately 2000m, and south to 'Yacht Club' as shown in Figure 3.1 by the yellow line. The outer limits of the study area have been selected based on the NMP zoning plan, and the 2000m distance offshore approximates the limits of the diving zone.

The water surface area within the determined study location is approximately 19,520,000 m^2. The non-usable area of water has been estimated to be 2,770,000 m^2, and includes the reef areas, the area between Booby Cay and Rutland Point (intended for travel only), the fish replenishment zone in Bloody Bay (blue boxes on Figure 3.1), and a 100m coastal buffer to represent the swim zone. This leaves an estimated 16,750,000 m^2 as water area usable for recreational purposes, as indicated in Table 3.2.

Table 3.2 Area Suitable for Recreation

	Total Water Area (m^2)	*Non-usable area (m^2)*	*Usable Area (m^2)*
Long Bay	15,620,000	2,150,000	13,470,000
Bloody Bay	3,900,000	620,000	3,280,000

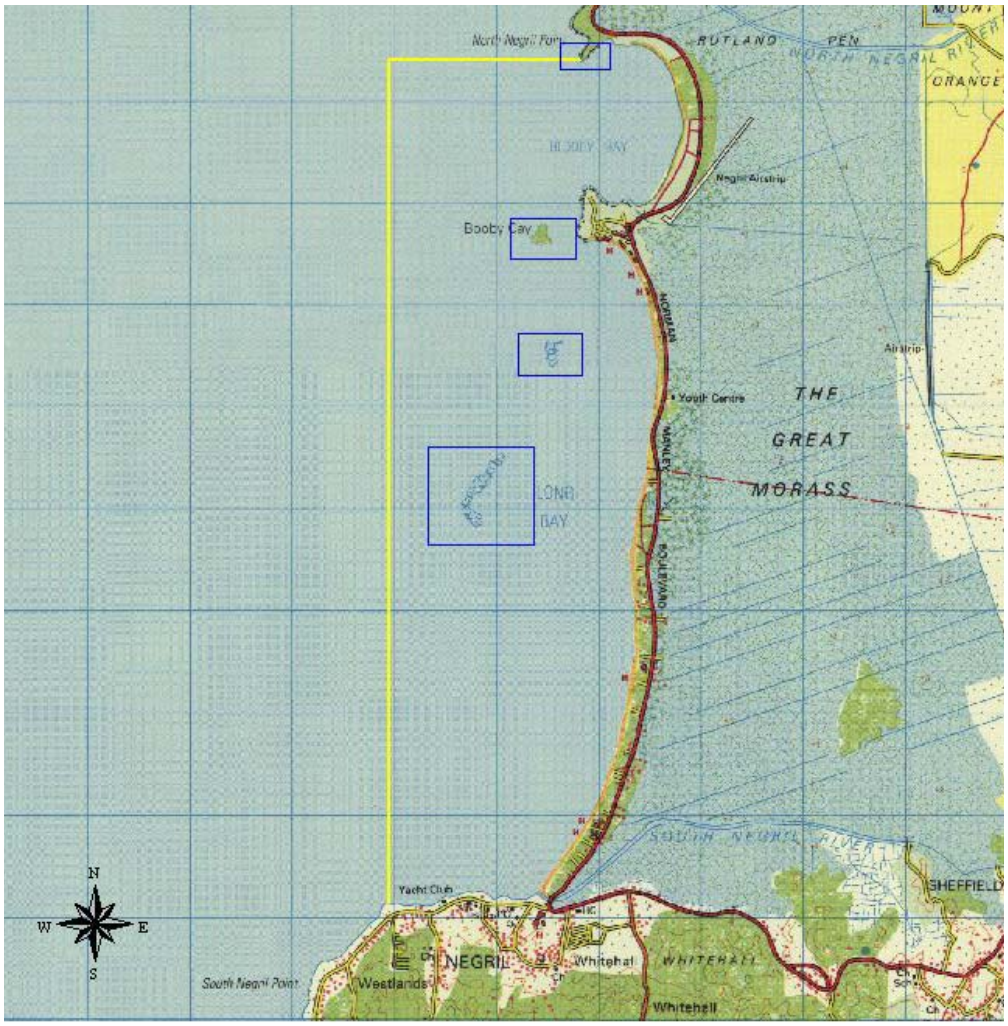


Figure 3.1 Boundaries and non-use areas of the study area

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 10acres (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 Long Bay and Bloody Bay have been calculated, and are presented in Table 3.3 following.

Table 3.3 Combined Use Vessel Carrying Capacity for Negril – Study Area

	Usable Water Area	*Optimum Boating Density (combined use)*	*Carrying Capacity (CC) for combined use*
Long Bay	13,470,000 m²	40,500 m²/vessel	332 vessels
Bloody Bay	3,280,000 m²	40,500m²/vessel	80 vessels

Based on this calculation, the study area can accommodate a total of 412 motorized and non-motorised vessels combined, without compromising safe, recreational use, aesthetic enjoyment and/or environmental quality.

Observations during the field assessments (presented in Section 2.2.3) indicated that there are 142 motorised vessels using the study area, and no more than 30 vessels were ever observed in use at one time. This is well within the calculated vessel capacity for the study area. However, it must be clarified, that the observed activity took place in a limited area of water totaling approximately 1,150,000 m^2 (100m outside of the marked swim zone). This is less than 7% of the determined total usable water area. The extent of the available water (NMP) is not being used for watersports.

Applying the same desired vessel density of 40,500m^2/vessel to the area of observed activity (1,150,000 m^2), a recreational carrying capacity of 28 vessels is obtained. The specifics of this calculation are presented in Table 3.4. Based on these calculations, the vessel density in the area presently being used for watersport activities is more than 180% of the vessel capacity of the area.

Table 3.4 Combined Use Vessel Carrying Capacity for Negril – Current Use Area

	Total Usable Area (m^2)	*Vessel Capacity of Total Area (vessels)*	*Current Use Area (m^2)*	*Vessel Capacity of Current Use Area (vessels)*	*Actual Maximum # vessels observed*	*% of Vessel capacity of current use area*
Long Bay	13,470,000	332	900,000	22	29	131
Bloody Bay	3,280,000	80	250,000	6	22	367
Total	16,750,000	412	1,150,000	28	51	182

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 Negril 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 (three 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 Negril. 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 Negril.

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 Negril. 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 determine the following:

- The current level of participation in water sports in Negril.
- Whether or not what was being offered in the water sports industry was what was in demand by visitors to the island.
- Whether or not the water sports operators were providing enough services to fill the needs of current and potential participants.
- Whether or not the quality of the water sports services offered made Jamaica a true competitor in the water sports industry.
- Whether or not there was space for improvement of water sports 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 water sport activities in Port Antonio. Independent, non-focused interviews were conducted with water sport 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.

The questionnaire was pilot tested among foreign nationals residing in Jamaica and who frequently participate in water sports, 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.

These completed surveys and the individuals' personal assessments were discussed to see whether the intended meaning of the questions was clear, and if their responses were typical of what could be considered useful for this exercise. A copy of the survey instrument is presented in Appendix II.

A two (2) person team implemented the surveys in Negril. Respondents were approached randomly in the vicinity of water sports facilities, and were screened only to

see if they had already participated in water sports while in Jamaica. The researchers were not required to survey tourists only.

The research was conducted over the course of 2 days in the first week of January. It was discovered that neither early mornings nor late evenings were conducive to questioning tourists, so surveying began in the late morning on a Saturday, and finished up in the late afternoon on a Sunday. In each location, the 2 team members met first with their gatekeepers (Director of Operations at Beaches Negril, the General Manager at Sandals Negril, the owner of the Negril Scuba Centre, and the manager of a jet ski booth) and discussed the fundamentals of the project with each. At the hotels, the 'playmakers' and water sports operators were advised that we would be seen speaking to guests at the hotel, and in the event that any if the guests were concerned, to indicate that we had the support of the hotel management and staff.

Team members patrolled the beach at 'Beaches', starting at poolside and continuing down to the location of the water sports desk, and back up. An estimated 70% of persons asked actually completed the questionnaires. At 'Sandals Negril', and both independent operators, the employees themselves asked the participants to assist us. This turned out to be quite useful, as all persons asked to complete it did so. A total of 63 questionnaires were handed out and returned in Negril.

The responses were coded, entered on the Statistical Package for Social Sciences (SPSS) and analysed. Bar and pie charts were used to graphically depict relevant information. A calculation of margin of error is not appropriate due to the qualitative nature of the data. The term missing is used by SPSS to indicate an unanswered question.

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

4.1.1. Constraints

In completing data collection, a number of difficulties surfaced.

1. While the questionnaire was tested among visitors, some of the questions appeared to be challenging when taken out into the field. For instance, question 3 asked the respondent to indicate nationality, and quite a few respondents understood the question to be asking their racial background. Anecdotal evidence suggests that American tourists have a similar difficulty when completing the Jamaican Customs and Immigration forms.
2. Tourists are most readily available during late morning to late afternoon, severely shortening the time in each day which can be dedicated to surveying. Time allotted the team to complete both research and report of analysis did not allow for proper canvassing of visitors.
3. Tourists are generally unwilling to complete questionnaires or submit to any surveys while on vacation. As with any written survey, great care had to be taken to insure that respondents were not simply writing in *ad hoc* responses in order to be done with the exercise. However another dimension was added by the prevalence of 'touts' in tourist areas, as prospective respondents immediately

assumed that researchers were attempting to sell something, and rebuffed all attempts at communication.

As this forms the first part of the research effort, it is possible to remedy these difficulties in future sampling drives. Primarily, sampling must take place over a longer time period in order to mitigate the negative effects of the idiosyncrasies of a visiting and itinerant sample population.

4.2.S.W.O.T. Analysis

Located at the western tip of the island of Jamaica, Negril is the fastest growing resort destination on island. As of December 2004, the total number of hotel rooms available in the Negril area was 3,638. Statistics show that Negril hosted 28, 237 visitors up to December 2004[2]. Known for its several miles of white sand beaches, Negril has been tagged as the "Capital of Casual". The tourist trade has increased rapidly in the last few years in this area. Of all the resort areas, Negril has been described as "the most ideal" for water sporting.

The uninterrupted miles of beach provide numerous public beaches allowing for varied water sports operations from parasailing to party and romantic sunset cruises and also jet-skiing, banana boats, glass bottom boats, snorkeling, deep sea fishing and windsurfing. The relatively flat landscape allows for some wind suitable for windsurfing while the calm, flat seas is most suited for water-skiing. This area is not well known for sport fishing (i.e. Deep Sea Fishing). Diving in the designated areas (outside of the fishing areas) is superb. A water sports enthusiast has described West of Negril as a "water sporting paradise" with countless reefs which support "big fish life".

The town famous for its spectacular sunsets is situated approximately one-hour's drive west of Montego Bay - the port of entry for the majority of the visitors to the island. The recently completed road expansion project (Highway 2000) has made this tourist destination more accessible by road.

Strengths
▪ Several miles of continuous beach facilities with the most ideal conditions necessary for water sporting activities. ▪ Prevailing wind conditions and marine environment provides conditions suitable for ideal water sporting activities. ▪ Age demographics of visitors congruent with market profile of water sports enthusiasts and participants.

[2] JTB Monthly Statistical Report Dec 2004 Vol. Xiv No. 12

Weaknesses

- Limited growth potential due to space limitation in marine traffic area. The vessel density is more than 180% of the recommended capacity
- Harassment outside of the all-inclusive beachfront properties.
- Lack of decompression chamber in this region.
- Although swim zones were mostly demarcated, it would appear that area is insufficient for serious or skilled swimmers, as many persons were observed at the edge of the zone or on the outside of the boundary
- Narrow swim zones further encroached upon by motorized craft operating or moored at the immediate outer boundary of the zone, which creates moderate wave displacement, small oil/lubricant deposits on the water, and noise pollution
- Decline of the health of the eco – system in the study area

Opportunities

- Relative flexibility and co-operation in observing environmental restrictions.
- Potential for modern activities such as underwater trekking, submarine underwater tours, wake boarding etc.
- Completion of the improved road network between Montego Bay, also a cruise ship terminal and Negril.
- Potential for expansion of water sporting area west of Negril.

Threats

- Pollution and environmental degradation
- Drug vending
- Harassment (from legal and illegal operators)
- Traffic density contributing to limitation of restricted areas for swimming.
- Over fishing (small scale)
- High concentration of marine traffic (legal and illegal) possibly contributing to the increased incidences of marine accidents in an already heavily trafficked area

4.3.Findings of User Survey

4.3.1. Market Profile

Nationality

- 48% of respondents were American
- 4% German
- 1% Swiss
- 1% Japanese
- 2% Puerto Rican
- 5% British
- 1% French

Gender

- 63% of respondents were male and
- 37% female

Age Group

The age distribution of the respondents were as follows:

- Ages 16 – 25 years - 19%
- Ages 26 – 35 years - 38%
- Ages 36 – 45 years - 19%
- Over 46 years - 13%

The majority of the respondents were between the ages of 26 and 35 years of age. Annual visitor demographics indicate that tourist visitors to Jamaica of all ages tend to be evenly represented, but across different seasons. The winter tourist season, whilst it is high season, attracts different age groups at different times throughout. This survey was conducted in early January which is not considered a peak period in the winter.

Motivation/Attitude

Out of all possible responses, only 14% of respondents in Negril indicated that water sports were at least one of their reasons for visiting Jamaica:

- 3% indicated that water sports was their only reason
- 6% indicated both scenery and water sports
- 5% indicated culture, scenery and water sports

The fact that only 3% chose Jamaica only because of water sports activities indicates

that the majority does not consider Jamaica a water sport destination. For example, according to an overview of Jamaica written by Undercurrent, an Insider Report and Consumer Letter for 'serious divers', experienced divers would become 'bored' on the first dive, but the venue is 'okay' for new divers.[3]

Water sports are simply one of the diverse attractions that the brand Jamaica offers, and niche marketing of Jamaica as a dive or water sport destination is not done by the main suppliers of room nights.

(The data was analyzed to determine if a relationship exists between water sports, nationality and age groups. However, since the majority of visitors to Jamaica are Americans between the ages of 26 – 35 years, the data is automatically skewed to represent the preferences of the largest group of visitors: Americans between the ages of 26 and 35 years. Since the questionnaires were only completed by persons who had done water sports, the data basically indicates that the majority of visitors to Jamaica are young Americans, a percentage of whom enjoy water sports.)

Type of Room Plan

- 82.5% of respondents had paid for an all inclusive plan
- 9.5% for a European plan
- 3.2% for other
- 4.8% did not indicate

76% of the survey respondents were first time visitors to Jamaica, and the majority, 82% stayed in all–inclusive resorts. All-inclusive resorts have become increasingly more dominant in the tourist sector in recent years and it is thus not surprising to find that the majority of visitors were registered at these hotels.

Discussions with respondents who had completed the survey indicated that persons who had paid for a European Plan had different expectations and would go to greater lengths in the pursuit of vacation pleasure, such as travel greater distances to participate in water sports, as opposed to persons who had paid for an all-inclusive plan. More in-depth analysis is found in the section on *length of time to travel to take part in water sport*.

4.3.2. Analysis of Findings

Length of Current Visit

- 59% of visitors were staying for 5 – 7 nights
- 25% for over 7 nights
- 10% for less than 4 nights

[3] www.undercurrent.org, self-styled as 'The Consumer Newsletter for Serious Divers since 1975'

A visitor's length of stay is determined by a number of factors, including time available to them for vacation, and their level of disposable income. This question was included in order to determine if there could be any relationship between the length of stay and how much time a visitor would allocate to taking part in water sports, for instance how far away from their accommodation are they likely to travel to participate in an activity. If zoning of certain water sports activities should become a reality, a visitor's willingness to travel to participate will impact on the viability of that activity. More in-depth analysis is found in the section on length of time to travel to take part in water sport.

Watersports Preferences

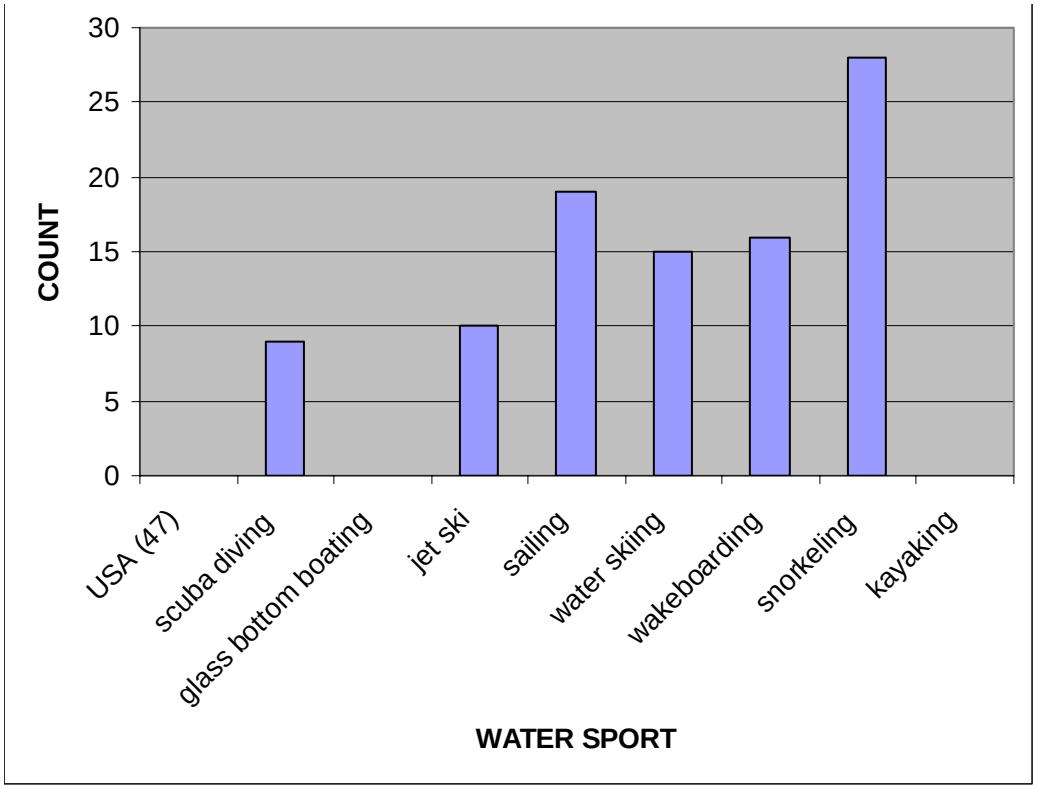


Figure 4.1 Preferred Watersports by Nationality

Please note that no visitor indicated glass bottom boating as a preference; this option was placed on the graph for ease of reference when compared with the chart depicting water sports actually pursued while in Jamaica. Please see Figure 4.5:

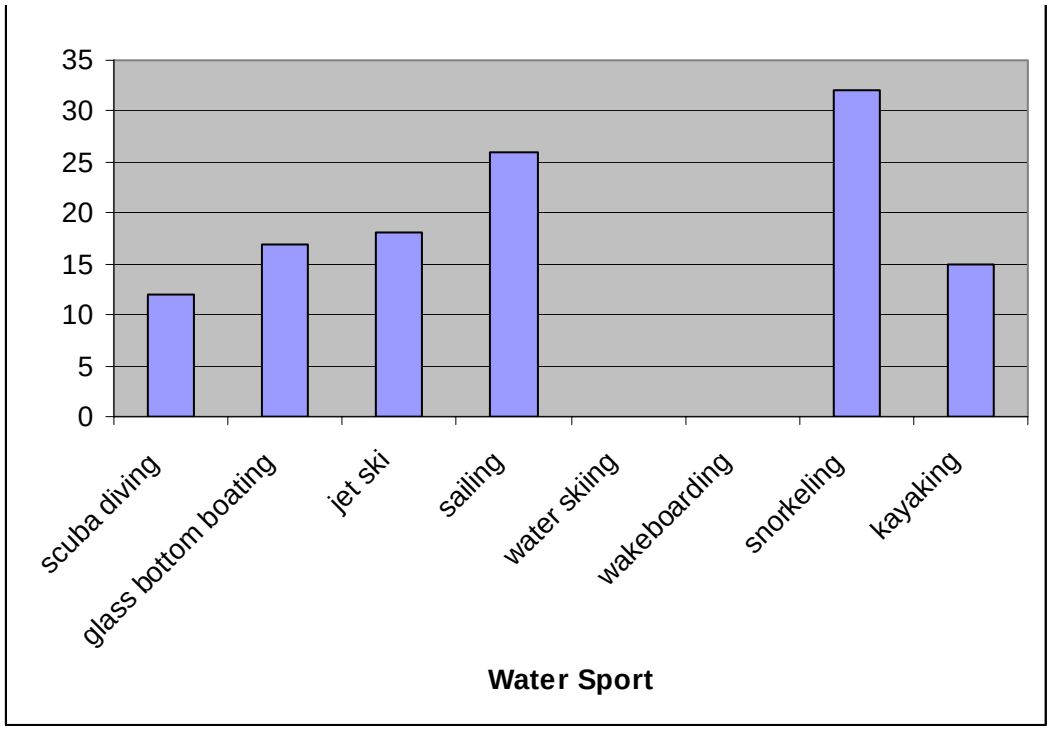


Figure 4.2 Participation in Watersports by Nationality

Respondents were asked to indicate their preferred water sport activities - preferred being those pursued within the last 3 years. Multiple responses were allowed, and the following was noted:

- 57.5% of male respondents indicated interest in snorkeling
- 30% in scuba diving
- 22.5% in jet skiing
- 22.5% in wake boarding
- 56.5% of female respondents indicated interest in wakeboarding
- 56.5% in snorkeling
- 43.4% in sailing

In total, 61.9% of respondents indicated a preference for water-skiing and wake boarding.

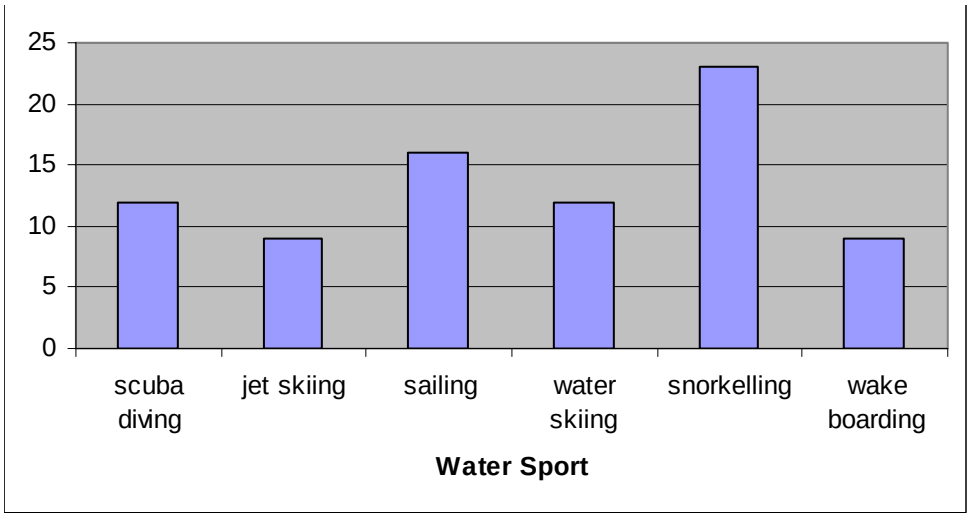


Figure 4.3 Watersports Preferences (Male)

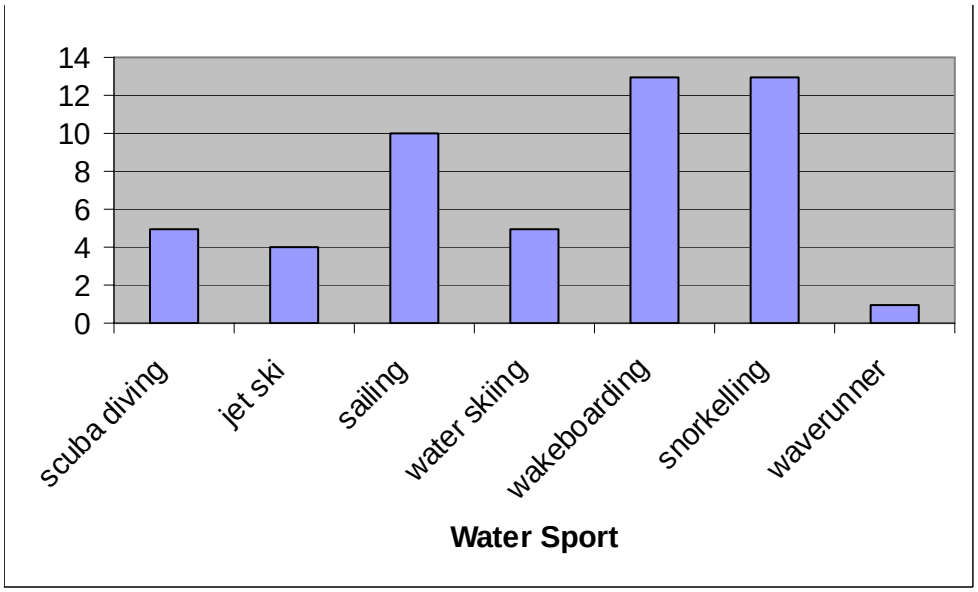


Figure 4.4 Watersports Preferences (Female)

To identify gaps between what persons wanted as opposed to what was available in Jamaica; the above information was cross-referenced with data on water sports actually participated in by respondents. Where no values are present for a category in the graph, it means that this sport was not available to the respondent.

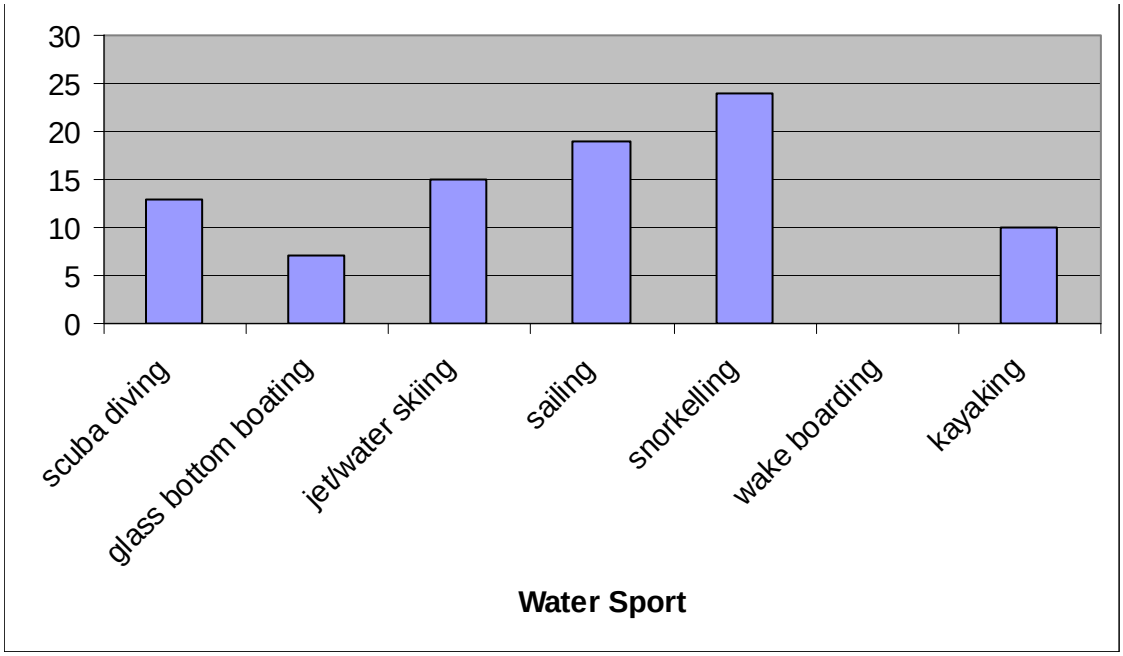


Figure 4.5 Watersports Participated in While in Jamaica (Male)

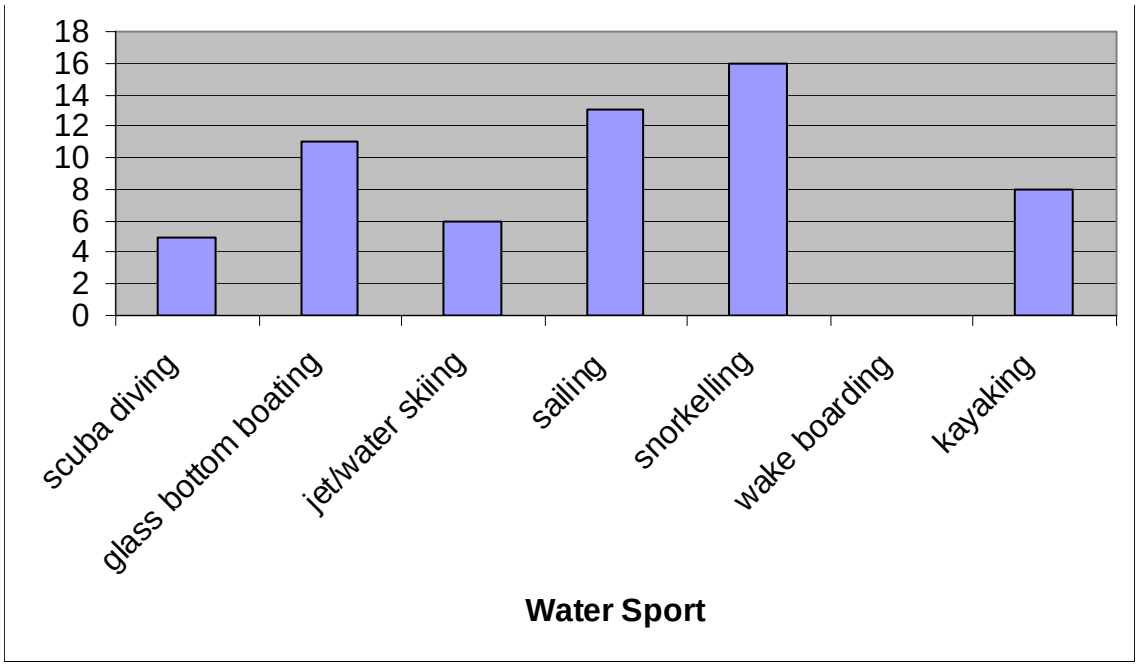


Figure 4.6 Watersports Participated in While in Jamaica (Female)

It is significant to note that despite mildly aggressive marketing by jet-ski operators on the beach, overall participation while vacationing in Jamaica only stands at 20.6%. The reasons for this are twofold:

- Jet-skiing is traditionally considered a more risky activity, and therefore engenders less demand (demand defined in the *economics* sense as interest backed by money available for spending);
- The all-inclusive hotels do not support jet-skiing as an activity for their guests, and actively dissuade guests from taking part in it. They do not provide assistance (transportation, recommendations, discount coupons) commonly provided for hotel-sanctioned activities, and do not take responsibility should anything happen to guests who jet-ski. Guests of all-inclusive hotels are therefore pre-conditioned to be biased against jet-skiing. (Wave runner providers do not agree that their activity carries an environmental or human risk.)

In general, activities sponsored, encouraged and included by all-inclusives tended to enjoy higher reported interest among survey respondents. Both snorkeling and scuba diving are offered by all-inclusives.

One must bear in mind the fact that demand for various water sports can be affected by changes in the tourist season. Consideration must therefore be given to the time of year during which the survey was done. During the winter tourist season it is more likely that visitors are older persons with greater disposable income. (Traditionally, winter rates are higher.) It is reasonable to conclude therefore that older persons may prefer less risky activities, and that the water sport preferences would be different during spring break and summer when the tourist demographics represent a younger visitor population. Had the survey been conducted during these times, it is expected that there would have been more respondents in the 16 – 25 age group (college-age), who would more likely have indicated preferences for more active water sports such as skiing and surfing.

Choosing Destinations that Cater to Preferred Activities

- 63.5% said that yes, they chose destinations that catered to their preferred water sport activities;
- 32% said no
- 3% did not indicate

The data indicate that a great potential for marketing of Jamaica as a water sport destination exists. 14% of respondents indicated that water sports was at least one of their reasons for visiting Jamaica, while 63.5% of respondents state here that they regularly choose destinations for water sport activities. The concerns are twofold:

- Water sport centres in Jamaica are not sophisticated enough to maintain the interest of serious water sport enthusiasts in order to market Jamaica as a realistic water sport destination;
- It is the *diversity* of the brand Jamaica that lures visitors.

Travel Time to Participate in a Watersport

- 23.8% would travel up to 15 minutes;
- 22.2% would travel up to 30 minutes;
- 33.3% would travel up to 1 hour;
- 17.5% would travel for more than 1 hour; and
- 3.2% did not indicate

This question must be viewed in conjunction with the responses to other questions. For example, one expectation was that persons staying in all-inclusives would not intend to travel for any length of time to take part in any activity not offered on the hotel property. However, the data did not support that expectation. When the data was compared to that of the type of room plan purchased by respondents, there was no significant preference. All-inclusive respondents were fairly evenly represented between 15 minutes, 30 minutes, and up to 1 hour.

Of the persons who reported that they choose travel destinations for water sports:

- 22.5% would travel for up to 15 minutes to take part in a water sport activity;
- 25.0% would travel for up to 30 minutes;
- 35.0% would travel for up to 1 hour; and
- 17.5% would travel for more than 1 hour

Of the persons who reported that they do NOT choose travel destinations for water sports:

- 25.0% would travel for up to 15 minutes to take part in a watersport activity;
- 20.0% would travel for up to 30 minutes;
- 30.0% would travel for up to 1 hour;
- 20.0% would travel for more than 1 hour; and
- 5.0% did not indicate

In contrast, among the 6 persons staying 4 nights or less, 2 would travel for up to 15 minutes, 2 for up to 30 minutes, and 1 for up to 1 hour. Of the 37 staying for 5 to 7 nights, 10 would travel for up to 15 minutes, 13 for up to 1 hour, and 7 each up to 30 minutes or more than 1 hour.

Nationality vs Water Sport Enjoyed

Americans, being the majority, represented a much wider cross section of the activities available. Other nationalities concentrated their interest on the slower, non-motorized activities (German, Swiss, Japanese, Puerto Rican, and British). Snorkeling/scuba diving enjoyed the highest ratings, with 62.5% of Americans, 2 0f 3 Puerto Rican and 3 of 5 British respondents indicating preference for these sports. 20.8% of Americans indicated water/jet-skiing.

Environmental Awareness

Most respondents, 87% consider themselves environmentally conscious, and 71% of these persons would be supportive of regulations that may restrict water sports activities but protect the Jamaican environment. Negril residents are focused on the environment and the minimizing of the effect of humans on its beaches and waterways. Some of the sites visited (hotels, sport centres, beaches) were certified Green Globe or Blue Flag and there were many posters and booklets encouraging environmentally-friendly practices in evidence.

Interestingly, all operators felt that over time, their clientele had become more environmentally aware. While they admitted that some persons still disobeyed instructions designed to protect the marine environment – touching and taking pieces of coral or shells – the majority complied. The operators themselves have instituted measures to prevent further deterioration of marine life, including reducing the depth of dives. (One visitor's complaint was that Scuba diving now attracted a price at the resort where it did not before. The explanation given by the hotel was that the cost helped to 'weed out' those persons who were not serious divers, and who consequently were less supportive of environmental guidelines designed to protect the reef and other aquatic organisms. Both the GM and the dive instructors considered this measure to be successful.) It would appear that operators, independent and otherwise, support measures which will protect the environment thereby ultimately protecting their business.

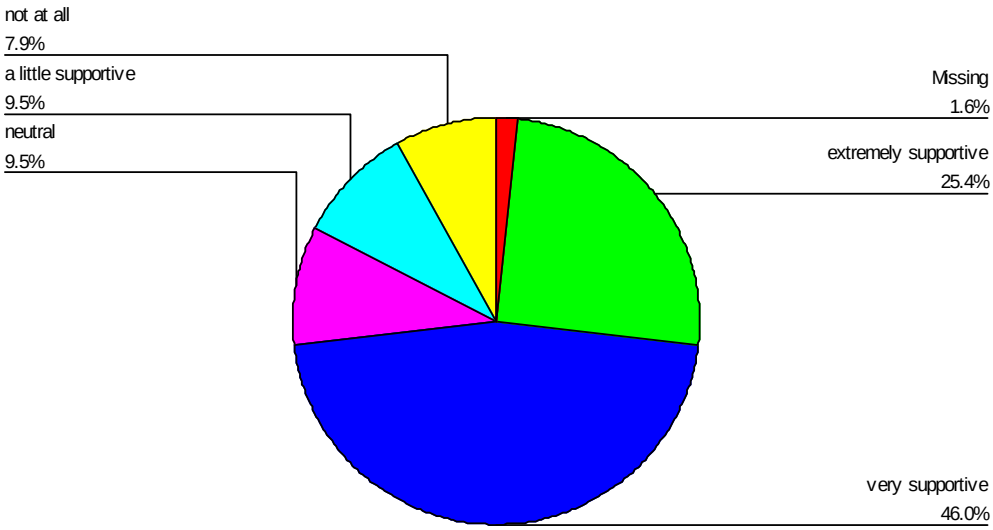


Figure 4.7 Visitor Support for Restrictive Regulations for Watersports

4.4.Market Size & Potential for Growth

Number of Hotel Rooms:	3,638 rooms
Number of Visitors (December 2004):	28,237 persons
Potential Revenue from water sports:	Between US$ 158,120 – 1,383,550

Recent JTB statistics indicate that for the period Jan – Dec 2004, Negril enjoyed a total of 22.2 % of all stop over arrivals to the island. (JTB Monthly Statistical Report Dec 2004 Vol xiv. No 12).

4.4.1. Available Accommodation

Negril accommodation types are varied and wide catering to a myriad of consumer preferences. The larger resorts offer the all-inclusive concept and water sport activities are a part of the package. The smaller inns, hotels, villas and guests house do not necessarily offer water sporting activities but recommend local water sporting operations. Traditionally, clients of all-inclusive resorts tend to more readily explore the included water sporting activities as against the clients of the traditional hotels, inns, guest houses and villas who may be less inclined to do so due to a cost factor.

Table 4.1 Available Accommodation in Negril

	Units				Rooms			
	2000	2001	2002	2003	2000	2001	2002	2003
<50 rooms	36	37	40	40	1008	1036	1084	1076
51 – 100	10	10	10	10	694	694	694	823
101 – 200	3	2	2	2	472	272	272	272
>200 rooms	5	7	7	7	1284	1890	1890	1918
Total Hotel	**54**	**56**	**59**	**61**	**3458**	**3892**	**3940**	**4089**
Guest Houses	96	96	99	100	907	916	916	953
Resort Villas	236	241	249	253	691	724	740	758
Apartments	17	17	18	18	36	36	51	51
TOTAL	**403**	**413**	**425**	**432**	**5092**	**5568**	**5647**	**5851**

- 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.

Most guest accommodation facilities make no special provisions for water sporting enthusiast. Changes in décor styles and preference have resulted in tiling being the floor treatment of choice – purely aesthetic rather than deliberate. Additionally, most have made no provision (as in storage areas or lockers) for persons who chose to travel with personal water sporting gear/equipment.

Fundamentally the only potential for growth in Negril is the expansion of resort development further north (Bloody Bay), as has been the case for the recent construction of 800 rooms by the Spanish developers RIU. Resort development within the Long Bay area is largely at capacity with existing facilities and the only possible shift along Long Bay would be reconstruction at higher density. There is limited beach frontage left in Negril save for a few land parcels owned by the Urban Development Corporation for small size resort development. Between Negril and Green Island the coastline areas with significant beach frontage are privately owned with no immediate development plans and inland are largely parts of the Royal Palm Reserve.

Regarding expanded diversity of existing watersports activities, there is room for offering focused on large marine crafts.

4.4.2. Supplier's Characteristics

- A majority lay in all inclusive resorts
- Other operators are on/off beachfront locations with an average size staff of 8-10 employees.
- All-inclusive resorts are in possession of all required certification from the Maritime Authority of Jamaica, Jamaica Tourist Board and TPDCo.
- Some illegal operators concentrate on jet ski rentals and glass bottom boat tours, and are known to harass 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 water sporting (SCUBA diving in particular). The ABC islands and Cancun also heavily market water sports 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 eco-tourism its fastest growing sector. The possibility of water sport 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 water sports 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).

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 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).

4.6. Recommended National Watersports Marketing Strategy

4.6.1. 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.

4.6.2. 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.

4.6.3. 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 Geography 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.

4.6.4. General Recommendations

- 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.

5. Summary of Findings & Recommendations

5.1. Compliance with Watersports Licenses

There is a wide range and significant number of watersports on offer in Negril which poses a threat to safety and the environment there. However, there is also an existing use zone structure for the area, aimed at promoting safety and environmental quality. The main problems with the watersports activities in Negril are that limited respect is shown for the zoning structure, there is non-compliance with watersports licenses, and there are unlicensed operators.

It is very difficult to determine the full extent of illegal watersport activities in Negril; illegal activities include licensed operators who are not abiding by the regulations and unlicensed operators. However, the presence of illegally operating glass-bottom boats and waverunners is highly visible.

Interviews with tourism industry personnel indicated that there are about 30 illegal waverunners in operation in the area, with 5 of them in Bloody Bay. The very new large waverunners seen at Negril Tree House without hull markings were apparently recently imported, but have not been inspected by the MAJ. There are also believed to be about 7 unlicensed glass bottom boats.

With consideration of the improper behaviour of licensed operators it could conservatively be estimated that over 50% of the total activity observed is not legal. Some of the bad practices observed by waverunner operators include:

- solicitation
- non-recreational traveling
- rental to immature riders
- driving in swim zone
- refuelling on beach and in water

5.2. Watersports Capacity, Zoning & Safety

Based on the findings of this capacity assessment, ***the study area*** can accommodate more vessels than the current number of vessels known to use the area. However, the ***area typically used*** for watersports is less than 10% of the available water in the study area, and the number of vessels in operation in this smaller area exceeds its capacity by approximately 200%. This therefore poses a threat to the safety, aesthetics and environmental quality of the resort town. The exceedance of the carrying capacity in the typical use area is particularly high in Bloody Bay, and the traffic observed in this area is primarily solicitation, and not so much visitor recreation.

Apart from the demarcation of the swim zone, and the general respect shown for not conducting activities within the swim zone, there are no clear zones for the carrying out

of particular activities. Both motorized and non-motorised activities take place together and in relative close proximity, within an area just outside of the swim zone.

There were no distinct use patterns observed during the field assessment. The movement of the vessels in both bays appears to be sporadic, and demand-driven. However, some trends as to the locations and times of operations were noted.

5.3.Recommendations

5.3.1. Zoning

The existing NMP zoning is not sufficiently or consistently visible. It is recommended that:

- The proposed zoning of the marine park be further implemented and supported by legislation.
- A swim zone be implemented in Bloody Bay.
- Entry/egress channels be marked within the swim zones.
- Persons should be advised to stay within the swim zones. When persons do venture beyond the swim zone there should be precautions taken e.g. bright coloured markers.
- The proposed zone for non-motorized craft only (excludes swimmers also) be made visible (using buoys). This can then serve as a buffer along the seaward edge of the swim zone.
- A number of areas be designated for the conducting of towed tours preferably further out to sea, and guidelines as to what the tour may include be established.

5.3.2. General Safety & Environmentally Friendly Practices

Given the obvious disregard for shore and marine safety and within the context of the NMP as a protected area, the following safety and environmental considerations are recommended:

- Where smaller bathing areas are in place, the beach end of the rope should terminate in the water and be anchored without causing obstruction underfoot along the beach.
- The mooring ropes found along the beach face which pose obstructions should be removed and mooring 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.
- 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.

5.3.3. Licensing

Based on the observed non-compliance and limitations of both watersports and beach licenses, the following are recommended:

- 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 waverunners). Put a condition on watersports license for no-solicitation using vessels.
- Re-establish the 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.
- For ease of access along the shoreline, vessels should be stored further up on the beach during the day. This may be accomplished through the Tourism Licences.
- The mooring ropes found along the beach face which pose obstructions should be removed and mooring only be allowed in designated areas. This may be accomplished through requirements in both the Beach Licences and the Tourism Licences.
- 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.

It is imperative to note that all the above recommendations 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*.

6. References

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Appendix I

List of the types of vessels (at rest) seen early in the morning

Type	*Number*	*status*	*Notes*
Glass Bottom	20	berthed	South Negril River 19 Feb 2005 0700 a.m.
Fibreglass canoe	14	berthed	South Negril River 19 Feb 2005 0700 a.m.
Fibreglass canoe	1	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Yacht	1	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Glass Bottom	7	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Catamaran	3	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Sport Fisher	2	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Power Boat (small)	6	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Dive Boat (Sandals)	1	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Parasail	2	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Ski boat	2	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Rescue	1	Anchored	Long Bay (north) 20 Feb 2005 0730 a.m.
Fibreglass canoe	5	At sea	Long Bay (north) 20 Feb 2005 0730 a.m.
Glass Bottom (Swept Away)	1	Anchored	Long Bay (middle) 20 Feb 2005 0750 a.m.
Dive Boat (Swept Away)	1	Anchored	Long Bay (middle) 20 Feb 2005 0750 a.m.
Glass Bottom	3	Anchored	Long Bay (middle) 20 Feb 2005 0750 a.m.
Ski Boat	2	Anchored	Long Bay (middle) 20 Feb 2005 0750 a.m.
Parasail	2	Anchored	Long Bay (middle) 20 Feb 2005 0750 a.m.
Catamaran	3	Anchored	Long Bay (middle) 20 Feb 2005 0750 a.m.
Fibreglass canoe	7	Anchored	Long Bay (middle) 20 Feb 2005 0750 a.m.
Power Yacht and tender	2	Anchored	Long Bay (middle) 20 Feb 2005 0750 a.m.
Sport Fisher	1	Anchored	Long Bay (middle) 20 Feb 2005 0750 a.m.
Paddle canoe	1	moving	Long Bay (middle) 20 Feb 2005 0750 a.m.

Type	*Number*	*status*	*Notes*
Power boat	1	moving	Long Bay (middle) 20 Feb 2005 0750 a.m.
Power Boat	3	Anchored	Bloody Bay on 20 Feb 2005 at 0715 a.m.
Power Yacht (Zein)	1	Anchored	Bloody Bay on 20 Feb 2005 at 0715 a.m.
Glass Bottom	3	Anchored	Bloody Bay on 20 Feb 2005 at 0715 a.m.
Dive Boat	2	Anchored	Bloody Bay on 20 Feb 2005 at 0715 a.m.
Parasail	1	Anchored	Bloody Bay on 20 Feb 2005 at 0715 a.m.
Fibreglass Canoes	5	Anchored	Bloody Bay on 20 Feb 2005 at 0715 a.m.
Waverunner	7	On beach	Negril Tree House, new, no hull markings, 19 Feb 2005
Waverunner	10	On beach	Seatec Watersports beside Merrils I, opposite channel, 19 Feb 2005
Jet Ski	1	On beach	Seatec Watersports beside Merrils I, opposite channel 1, 19 Feb 2005
Waverunner	5	On beach	Ocean Tours Watersport at Fun Holiday, "8" on front, 2 with no hull markings, opposite channel 2, 19 Feb 2005
Waverunner	9	On beach	CETA Motors at Chances Restaurant, opposite channel 3, 19 Feb 2005
Waverunner	6	On beach	Tingling Watersports at Rays Watersports, 19 Feb 2005
142 Total Motorized Vessels			

Vessels observed operating on the reefs of the study area

Type	*Numbers*	*Notes*	*Time*
Glass Bottom	5	on coral reef fronting Long Bay	18 Feb 2005, 0900
Glass Bottom	4	on coral reef fronting Long Bay	18 Feb 2005, 1000
Sunfish	1	on coral reef fronting Long Bay	18 Feb 2005, 1000
Fibreglass Canoe	8	at 'snorkeling' reef in Long Bay, not trolling, maybe anchored or drifting	19 Feb 2005, 0720
Sport Fisher	3	Far out to sea in front of Long Bay	19 Feb 2005, 0720

Vessels observed underway in Long Bay on 19 Feb 2005 between 10:00 – 10:03 a.m.

Type	*Numbers*	*Notes*
Small RHIB	3	Heading south (and then return) along edge of swim zone with a guide leading.
Parasail	1	
Waverunner	1	
Dive Boats	2	Moored between Booby Cay and snorkelers reef
Sunfish	1	Between Booby Cay and snorkelers reef
Dive Boat	1	
Peddle boat	1	
Hobie Cat	1	
Kayak	1	Single seater
12 vessels total (8 motorised, 4 non-motorised)		

Vessels observed underway in Long Bay on 19 Feb 2005 between 10:50 – 10:55 a.m.

Type	*Numbers*	*Notes*
Hobie Cat and Sunfish	11	
Glass Bottom	2	One cruising, One coming into beach
Glass Bottom	3	Moored on Snorkelors Reef
Power Boat	1	Outbound from beach
Rescue Boat	1	Heading north
Kayak	1	
Waverunner	3	One on the swim zone line, one adjacent swim zone at high speed
Kayak	2	Being used by spear fishermen and conch divers
Power Boat	1	Towing banana ride
Glass Bottom	2	On snorkel reef
Yacht	2	
29 vessels total (15 motorised, 14 non-motorised)		

Vessels observed underway in Bloody Bay on 19 Feb 2005 at 11:10 a.m.

Type	*Numbers*	*Notes*
Waverunner	2	No hull markings
Sunfish/hobie cat	7	
Sport fisher	1	Outside of bay
Fiberglass canoe	1	
Peddle boat	3	
Kayak	5	
20 vessels total (5 motorised, 15 non-motorised)		

Vessels observed underway in Bloody Bay on 19 Feb 2005 at 11:40 a.m.

Type	*Numbers*	*Notes*
Parasail	1	
Waverunner	4	No hull markings
Sunfish/hobie cat	7	
Glass Bottom	1	
Peddle boat	5	
Kayak	3	
Dive boat	1	
22 vessels total (7 motorised, 15 non-motorised)		

Vessels observed underway in Bloody Bay on 19 Feb 2005 at 15:28 p.m.

Type	*Numbers*
Waverunner	8
Sunfish/hobie cat	7
Glass Bottom	1
Peddle boat	5
21 vessels total (9 motorised, 12 non-motorised)	