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ISSUES AFFECTING BEACHES IN GRENADA

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ABSTRACT

Grenada's beaches fulfill a number of functions, they provide fine aggregate for construction; they are important as an area for recreation and tourism; they also provide fish landing sites and areas for pulling up boats; finally they are an important animal habitat. Several conflicts between the various uses are discussed, the major conflict being between the use of the beach for sand mining and as a recreational resource. The need for well defined legislation and greater cooperation between the various coastal stakeholders is emphasized.

INTRODUCTION

The state of Grenada comprises three islands namely Grenada, Carriacou and Petite Martinique. Together they make up a land mass of 133 square miles. The principle industries are tourism, light manufacturing and agriculture, particularly the production of spices for which Grenada is famous and has earned the name "Isle of Spice".

With a population of approximately 100,000 persons and an increased number of tourists using our beaches, they are of vital importance to our well being and economy. As such, Grenada's beaches today are used by a growing number of persons for various activities which often clash and conflict.

In the past, management systems to control the use of our beaches were virtually non-existent, except regulations regarding the removal of sand from beaches and a setback policy for Grand Anse Beach. However, the growing economic importance of tourism, the growth in population, the need for housing and the recognition of the importance of fish landing sites, necessitate management decisions to preserve the beaches and reduce, if not eliminate, user conflict.

This paper presents an overview of some the issues affecting beaches in Grenada. It looks at the use of beaches, conflicts that arise from those uses, access, ownership and community involvement in management.

When we use the term beach, what do we really mean? Beaches are areas of loose unconsolidated material at the junction of the land and the sea. They may consist of sand, mud, stone, coral fragments or boulders. In this presentation we will be dealing with sand beaches, since these are the most important to Grenada.

USES OF GRENADA'S BEACHES

A Source of Fine Aggregate

Sand from the beaches of Grenada has been a major source of fine aggregate for applications in the construction industry. About 85% of fine aggregate used in the construction industry comes from our beaches.

Despite the passage of the Beach Protection Law (No. 67, 1979) there still is evidence of sand mining on many of Grenada's beaches. This mining was particularly widespread during the construction boom of the '80's, thus causing a narrowing and lowering of the mined beaches and seriously aggravating the coastal erosion already taking place. Most sea defences presently in place, protecting roads and other infrastructure along the beach, are a direct result of uncontrolled sand mining in the '80's.

Source of Recreation

Beaches in Grenada are traditionally a source of recreation for our people. It is usual that on weekends, public holidays and evenings, Grenadians head to the beach where they would engage in beach and water sports.

The beach can be said to be Grenada's favorite "liming spot". Many people meet and socialize on the beaches and conduct activities such as picnics. Recreation and other social activities on our beaches constitute the single use which can conflict with most other uses.

A Part of the Tourism Product

Tourism is of major importance to Grenada's economy. All year round, tourists can be found on our beaches. However, the peak season for tourism in Grenada is during the winter months in North America and Europe, when many tourists utilise our beaches.

Traditionally, the emphasis was on offering sun, sea and sand, but today, the tourism product has widened to include other recreational activities e.g. water and jet skiing.

An Aesthetically Pleasing Part of the Environment

Simply put, beaches are places of healing. One can relate to the feeling of well-being while relaxing on the beach. We know the effect a perfect sunset or beautiful sunrise has on us, or those of us who are so inclined, the romance of the moonlight and the beach. Beach users, particularly locals, enjoy an environment where there are trees on the beach. However, when

these trees are replaced by development, a beach's appeal to island residents is diminished. When this happens local beach goers tend to abandon the developed beaches and instead frequent other undeveloped ones which provide inspiring views, cool breezes, and tranquilizing natural symphonies.

Provision of Fish Landing Sites, Habitats for Animals and Areas for Beaching Boats

It is not unusual, particularly on the western side of the island, to see the well co-ordinated movement of fisherfolk, as they use the beach to "pull seine" with their catch of fish. Other fisherfolk particularly those whose base are not served by a jetty land their catch on the beach nearest to their market, these beaches are therefore vital to the commercial fishery.

In addition, there are four (4) species of sea turtles using beaches in Grenada for nesting during the months of February through August, thus ensuring continuity of their species. Other animals too, use our beaches as their homes.

Other small sea craft operators use the beach as a place where they haul up their boats for repairs. The Carenage in St. George's, Grenada, though no longer a beach, got its name from the days when boat men would careen their boats there for repairs. Beaches also serve as a safe place for boats during storm weather or when there are no safe moorings available.

CONFLICTS IN THE USE OF BEACHES IN GRENADA

Possibly the biggest conflict arises between the need to remove sand from our beaches for use in construction of our homes and other infrastructural work and the need to have the beach for recreational purposes. When sand is mined particularly when it is done illegally, the beach loses its aesthetics. The beach becomes scarred with heavy vehicle tracks, while holes and mounds are left in the sand. Wild life who need the beach for their survival are put at risk as they cannot cope with what has now become a hostile landscape.

More recently a new type of conflict has arisen, between users of recreational crafts and bathers, divers and wildlife. For the most part, the problem is that crafts like jet skis are used by people with little or no experience in the operation of these crafts and can cause injury to other persons in the water. Even those who choose to remain on the sand are bombarded with noises from those crafts when they are operated too close to the shore. Water taxis plying back and forth between cruise ships and the beach also increase the risk of injury and conflict with swimmers, snorkelers and divers.

In 1993, the Grenada Board of Tourism and the Grenada Ports Authority sought to regulate a 300 ft. area of water immediately adjacent to the foreshore at Grand Anse. This did not meet with much success as the matter of enforcing the regulated zone was not efficiently

carried out.

Fisherfolk also create conflict when remnants of the day's catch are either dumped in the sea or on the beach, causing an unpleasant smell and sight, or when they haul up boats for repairs and leave them for extended periods creating obstacles for other users.

Another conflict that arises particularly on Grand Anse beach, our most popular one, is between vendors and other beach users. These vendors display their wares, mostly clothes, on lines strung on trees growing on the beach, thus obstructing free passage. This problem should be solved with the completion of the EC\$2.5 million vendors market at Grand Anse.

OWNERSHIP OF THE BEACH

It is often stated that "All beaches in Grenada are public property". This can be misleading because what is really public property is only the foreshore, that area that extends from the low water mark to the high water mark. Fortunately, our popular beaches are located on lands which are owned by Government and leased to developers except for the dry sand part. There are, however, other beaches which are located on private property, which are used by visitors and locals under the impression that all the beach is public property, but this amounts to a trespass on private property.

An example of how this matter can be addressed is in recent legislation adopted in St. Kitts Nevis, which states that the Crown (Government) owns the area extending twenty (20) meters beyond the high water mark. This type of legislation will protect most of the sand and allow adequate use of the area without trespass. Where there is no clear legislation, British Common Law is used to settle disputes and the following conditions have been upheld:-

1. Gains or losses in beach areas due to normal causes result in movement of beach boundaries. So if a beach accretes naturally, the land area of beachfront property increases; by the same token, on a beach that has eroded due to natural causes, beachfront property decreases in size.
2. A sudden change in the beach area resulting from a "non-natural" or human intervention, such as the construction of a groyne or a land reclamation does not change the beachfront property boundaries.
3. An owner has a right to protect his land, even though such works may cause damage to adjacent properties. And adjacent properties cannot claim compensation.

A look at condition number three shows that it is certainly not in the best interest of the islands which turn to Common Law for conflict resolutions. It would be better to examine current legislation and conditions existing on the beach and place regulations that will allow for sound

coastal management systems and reduced conflicts.

ACCESS TO GRENADA'S BEACHES

Most if not all of our beaches can be accessed from public roads. In some cases, access is by scant pedestrian trails established by user rights, others are motorable. Pedestrian access is sometimes seen as an inconvenience, particularly to residents with motor vehicles and boats. The provision of motorable roads gives access for the illegal removal of sand from the beaches.

There is more to the beach than just seawater and sand. The beach is an ambience which includes trees, birds and other flora and fauna. That is, the greater environment. This is what locals seek when they go to the beach. When this is replaced by buildings, beach chairs, umbrellas and other activities, that take away from the desired ambience, access is seen as having been restricted.

The imposition of a development setback policy would ensure the preservation of the beaches natural character as all development would take place behind the setback line. In Grenada, only the Grand Anse beach has a setback policy. Basically, the setback policy for Grand Anse means that all new developments at Grand Anse must be set back a minimum of fifty (50) meters from the present high water mark. High water mark is here defined as the upper limit to which the water reaches under normal conditions.

COMMUNITY INVOLVEMENT

It bears mentioning that beach management means nothing without community involvement. All stake holders must be involved. Often, beach management amounts to crisis management, that is, only when there is a crisis are regulations and controls put in place.

With the increased pressure for development of our lands, the need for beach management is essential. The related benefits are obvious, namely safeguarding our heritage and leisure space, ensuring the sustainability of the tourism industry and conserving our precious coastal ecosystems.

When the different stake holders - the Government and private sector, resident beach users and hotel owners, fishermen and divers - come together to solve conflicts and develop management approaches, the responsibility and benefits are shared by all. If not, the present problems will be exacerbated if we do not manage our beaches for posterity.

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MANAGEMENT OF MARINE TURTLE NESTING BEACHES ON WEST INDIAN ISLANDS

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ABSTRACT

The nesting habits and populations of the four species of sea turtles that nest on Caribbean beaches are described. The paper discusses ways to manage and conserve these populations. The foremost threat to marine turtle survival in the Caribbean is hunting and poaching. While legislation and enforcement are important aspects of management, experience has shown that education and peer pressure are the best weapons against poaching. Sea turtles also face indirect threats from human population growth and coastal development. Management practices for beach lighting, coastal revegetation, beach renourishment and beach cleaning are discussed in the context of habitat conservation.

INTRODUCTION

There are four species of sea turtles that nest on West Indian beaches. The hawksbill (*Eretmochelys imbricata*) is the most common and nests on virtually every island including those with intermittent beaches such as Saba (Netherlands Antilles) and Desecheo (Puerto Rico). West Indian island countries with substantial numbers of nesting hawksbills include the Grenadines, Dominican Republic, Jamaica, Cuba, Antigua, Puerto Rico and the U.S. and British Virgin Islands (Mager, 1985, NMFS and USFWS, 1993).

Hawksbills may nest and hatch out at any time of the year, however, nesting is usually from June to December with hatching continuing through February. The hawksbill's indiscriminate choice of beaches - from pocket beaches fronted by coral reefs and beach rock, to long beaches with sand offshore - makes it difficult to rule out any beach as a prospective hawksbill habitat. Their nests are shallow, often less than 25 cm from the sand surface, and therefore prone to disturbances from above.

Hawksbills usually nest under woody vegetation or very close to it, and may crawl 10 m or more into the vegetation. Some common plants hawksbills nest under in the northern Caribbean include bay cedar (*Suriana maritima*), sea grape (*Coccoloba uvifera*), coin vine (*Dalbergia ecastaphyllum*), cocoplum (*Chrysobalanus icaco*) and the Australian pine (*Casuarina equisetifolia*). Hawksbills do not generally nest colonially, but are dispersed both spatially and temporally, thereby making it more difficult to protect them and their nesting habitat. They are quite sensitive to human presence and prefer to nest on small isolated beaches, often on

offshore cays. Because of their isolated nesting habits, new hawksbill nesting areas are still being "discovered."

The pelagic leatherback (*Dermochelys coriacea*) migrates from colder waters to many Caribbean islands to nest. The two major nesting areas in the West Indies are Trinidad and the Dominican Republic, but nesting also occurs in Puerto Rico and St. Croix, and to a lesser extent in the Grenadines and St. Lucia (Mager, 1985). Although a beach may have only one or two nesting females, each female has the capacity to nest 10 - 11 times in a season, and may return to the same beach every two or three years.

There has been a gradual, but substantial increase in nesting at Sandy Point, St. Croix in the last 15 years. When research and protective measures began in the early 80's an average of 20 females nested annually - now that number has increased to 35-55 females a year. There appears to be a similar trend occurring in Puerto Rico, where some nesting beaches have been protected since the mid 80's. Large increases were also observed in Trinidad from the 60's to the 80's (Pritchard, 1989). Unfortunately considerable decreases have been noted in other areas such as the British Virgin Islands, where leatherback protection only began in 1986 (Cambers & Lima, 1990).

As opposed to the hawksbill, the leatherback generally chooses longer, wider high-energy beaches with sandy approaches. This species is not as perturbed by human presence and development, and will often nest on populated lighted beaches. It usually nests on the open beach platform or in sparse vegetation composed of vines such as beach morning-glory (*Ipomoea pes-caprae*), beach pea (*Canavalia rosea*), or grasses such as seashore dropseed (*Sporobolus virginicus*).

Although green turtles (*Chelonia mydas*) are often found grazing on sea grasses and algae in West Indian waters, few islands have any appreciable nesting with the exception of Aves. Colonial nesting occurs on this uninhabited sandy cay 220 km west of Dominica. Governed by Venezuela, the four hectare island was declared a wildlife refuge in 1972. Substantial nesting also occurs in Trinidad (Ogren *et al*, 1989), the Dominican Republic, the Grenadines, and Jamaica (Mager, 1985). There are still areas that have not been adequately surveyed such as Anegada (BVI), and nesting seems to be increasing in St. Croix and some offshore islands of Puerto Rico. West Indian colonies that have been virtually extirpated existed in Cuba and the Cayman Islands.

Green turtles prefer high-energy beaches with deep sand, and nest from March to December on Aves Island (Hopkins & Richardson, 1984). In St. Croix the peak of the season is in mid-October. Green turtles are perturbed easily, especially by movement on the beach, and will avoid beaches where artificial lights are visible (Mortimer, 1982).

The loggerhead (*Caretta caretta*) is not widely known for nesting in the West Indies, however nesting occurs in Cuba (Ogren *et al*, 1989), Jamaica, the Grenadines, and the Dominican Republic (Mager, 1985). They nest in scattered grassy dune vegetation during the summer

months. Although little is known about Caribbean loggerheads, a great deal of research has been done in the southeastern U.S.A., which supports the largest population in this hemisphere.

The four above-mentioned species are listed as vulnerable or endangered by the IUCN Red Data Book, and are listed in Appendix I (threatened with extinction) in the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES, 1973). Marine turtles are migratory and do not recognize national boundaries. They are a shared island resource and through international cooperation they may ultimately survive.

MANAGEMENT RECOMMENDATIONS

Management begins with a good beach monitoring program. As primary goals, managers should determine nesting species, density and favored beaches. Only from long-term studies will yearly fluctuations and population trends be deduced. Favored beaches can then be considered for special protection, and island-specific threats to turtles, eggs, or hatchlings can be minimized.

Legislation and Enforcement

The foremost threat to marine turtle survival on many Caribbean beaches has been and often still is hunting and poaching. Establishing laws to protect nesting females and their eggs is a start, however, there are often difficulties with enforcement. Usually there are not enough personnel and vehicles to patrol the beaches. Cultural differences between urban lawmakers and rural resource users can be a problem (Gomez, 1982). At times those in charge of surveillance at the beach may overlook offenders, or worst yet partake in the same crimes. When poachers are apprehended, local judges can be too lenient. Judges may be ignorant of the law or perhaps sympathetic to the offender. In many countries the fines are small in comparison to the profits that can be made on sea turtle products in the black market.

Difficulties with enforcement can result from inconsistencies between central governments and separate island governments. For example in Puerto Rico (U.S. Commonwealth), offenders may be penalized under local law or federal law, with quite different consequences. The agencies may squabble over who has jurisdiction in such a case. Another example is the Netherlands Antilles, which has diverse legislation existing on three levels - the Kingdom of Holland, the central (Netherlands Antilles) government, and the various island governments (Sybesma 1992).

Education

Experience has shown that in the long run education and peer pressure are the best weapons against poaching. Teaching children the life-history of sea turtles and the reasons they need protection can instill an enduring conservation ethic. Many older fishermen and coastal

residents have seen the decline of turtle populations in their own lifetime and are often the first to convince others of the need for conservation. When a community starts to protect "their" turtles, a poacher often becomes *persona non grata*, and the increase in local pride causes a gradual shift to non consumption. Living turtles become the focus of science fair projects, independent studies and eco-tourism.

Islanders often resent what they perceive to be the intrusion of big government, therefore non-governmental organizations (NGO's) can often be more effective in education and protection at the grass roots level. Slide presentations (especially with local turtles and people as subjects) can be given at schools, college, fishing associations, government agencies (e.g. Coast Guard), and civic and church groups. It is helpful to have available printed materials such as brochures or posters. Displays with preserved turtles and photographs work well at environmental fairs such as Earth Day celebrations.

Permanent displays can be mounted at ports of entry and nesting beaches. Turtle watches, if properly handled to avoid harrassment, make a lasting impression. Brochures can be made available at coastal resorts to minimize tourists' impacts on the nesting beach. For example, the brochure can warn people not to carry hatchlings to the sea, because this circumvents an important part of the orientation process. The Center for Marine Conservation in Washington, D.C. (USA) has a brochure entitled "Attention Beach Users", which can be modified to suit a particular island's needs, as has been done successfully by a Greek NGO.

Natural Threats

Natural threats to turtles can be classified as biotic and abiotic. Due to low biodiversity, predation is usually minimal on islands. The greatest threats to eggs and hatchlings are introduced species such as mongooses, rats, dogs, feral pigs, and fire ants. Population control, and fencing systems that either protect individual nests, entire beaches, or hatcheries have been used successfully to avoid predation.

Fencing nests or beaches is preferable to transferring eggs to hatcheries, because of the risks involved in handling eggs and changing the natural nest environment. A 1.5 X 1.5 meter square of fencing or screening material with holes big enough for hatchlings to escape can be secured flat over nests to ward off large predators. Fences can be erected around nests to prevent vehicles and pedestrians from crossing over nests, especially near hatching time. This type of fence should have a gap at the bottom large enough for the hatchlings to crawl under. Four posts and a rope can often serve the same purpose. If poaching is a problem, timely monitoring of the beach and camouflaging turtle tracks can be effective.

Abiotic hazards include saltwater inundation from erosion or storms, and freshwater inundation from flooding. If these dangers are anticipated, nest translocation can be a useful tool if carried out properly and promptly. Egg collection should occur during laying or within six

hours of laying. If eggs must be moved after this time, the top of each egg should be marked with a pencil, and at no time should an egg be rotated from this axis during the moving process (Pritchard *et al*, 1983).

It is best to select another site on the same or a nearby beach, and to dig a hole as close as possible to the original dimensions. Hatcheries fell out of vogue after it was discovered that nest temperature determines sex in sea turtles. Therefore, monoclimate hatcheries have a tendency to produce hatchlings of the same sex, instead of a natural sex ratio. Also land-based and marine predators may be attracted to the concentrated banquet of eggs or hatchlings at a hatchery site.

Developmental Impacts

Direct threats to turtles on many islands have been replaced by indirect ones primarily as a result of human population growth and coastal development. Islands with laws protecting turtles often lack laws protecting turtle habitats. Artificial lights are a serious and escalating problem. Lights can inhibit adult turtles from nesting, and can attract hatchlings and cause disorientation, circumventing their normal sea-finding behavior. Disorientated hatchlings often die from predation, being hit by cars, or desiccation.

Research on species-specific effects of light is ongoing, however, the general consensus is that no lights shining on or near the beach is the ideal solution for sea turtles. Fortunately there is a compromise for planners and developers. Out of all lights tested, one type of luminaire has been found not to disorient hatchlings at normal wattage - the low pressure sodium (LPS) vapor, or pinkish-orange street light common in many areas. High pressure sodium vapor is not an acceptable substitute for LPS, however, low intensity yellow "bug" lights are fairly safe to use (Nelson and Dickerson, 1989).

If necessary, other luminaires can be used or modified in one or more of the following ways - shielding and screening (with metal, wood, vegetation etc.), redirecting (aiming downwards and away from the beach), lowering light, lowering intensity, or limiting hours of use. For security purposes, motion sensitive lights are an excellent choice, because they only illuminate when something passes by and then they shut off automatically. In Florida, USA, many municipalities have developed lighting ordinances. Brochures are available for coastal residents explaining the problem and solutions.

Another area that can be managed is the deforestation of our coasts. Dune vegetation plays an important role in stabilizing shorelines, providing habitat for nesting hawksbills (and other animals), and buffering lights and development. Wooden dune crossovers help prevent foot traffic from trampling plants. Resorts and residents often strip vegetation for a better view of the ocean, and to have a cleaner looking beach. This trend needs to be halted and reversed if at all possible. Set-backs for buildings, roads and sand-mining operations should be implemented and

enforced.

Restoration of dune vegetation with native species is desirable. Exotics such as the Australian pine have caused extensive damage to coastal areas in Florida and are now prohibited (Nellis, 1994). Although this species grows quickly, in the long run it can cause erosion, because it does not allow undergrowth of grasses and low bushes. Additionally hawksbills have difficulty nesting beneath Australian pines because of the root structure. Dune reforestation projects should begin with grasses, because of their ability to grow upwards as the dune accretes. Nellis (1994) explains methods of propagation for seashore plants.

Erosion can be escalated by sand mining, man-made structures (e.g. jetties) and catastrophic events such as hurricanes. Armoring of beaches with rocks or cement is detrimental to turtle nesting unless sand is added to sufficient depth for nesting. Badly eroding beaches can be hazardous to turtle nests, however, extreme caution must be used when renourishing a beach. Because turtle nesting can occur year-round, a constant vigil would be necessary to identify and move any nests before they were covered over.

The physical characteristics of the new sand should be as close as possible to the natural beach sand, which plays an important role in hatching success of turtle eggs. For example greater compaction occurs on new beaches where fine angular sand is dredged from offshore borrow sites; while looser beaches result from coarse grains dredged from high-energy sites such as inlets (Nelson and Dickerson, 1989). beach compaction is a serious problem that can impede turtle nesting for a number of years until the sand is reworked by natural processes.

Beach compaction can also occur from vehicles driving on the beach, and this can prevent hatchlings from digging their way to the surface. Vehicles can crush hatchlings, and their tracks can trap hatchlings. Vehicles should not be allowed on turtle nesting beaches, except for light weight all-terrain vehicles used for research or emergency purposes. These should be driven near the water's edge, and not across dunes or vegetation.

Mechanical beach cleaning equipment can be hazardous to the shallow nests of hawksbills, and has a tendency to remove low-lying vegetation. Beaches should be cleaned by hand and beach cleanups can be organized by the community. Trash on beaches can entangle wildlife and attract pests that prey upon eggs and hatchlings. Lawn chairs, rental boats, and other resort equipment should not be left on the beach at night.

Large developments (tourist, residential or industrial) should draft habitat conservation plans as part of the regulatory process to insure sea turtles' protection from the threats listed above. An island which chooses to protect its marine turtles and nesting beaches will be protecting a number of other flora and fauna coincidentally. As Frazer (1985) reminds us "The rapid development of facilities to house, feed and entertain tourists should not be allowed to destroy the beauty that first attracted them to the Caribbean." Sometimes we do not know what we have until it is gone.

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GRACE BAY REVISITED, PROVIDENCIALES

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ABSTRACT

The impacts of tourism in Grace Bay, Providenciales, is discussed. Physical development and local plans have targeted this bay for tourism development. There are four major hotels and several smaller ones, most were completed before environmental impact assessments were mandated for such major projects. Development has taken place in the shoreline reserve (60 feet back from the high water mark) and dunes have been destabilised. The number of beach accesses has decreased, nearshore waters have become contaminated with sewage and liquid wastes and coral reefs are under threat. Several planning and institutional strengthening recommendations are proposed to mitigate these impacts.

INTRODUCTION

Local beaches revisited is a most awakening experience for a returning resident. The beaches, which were previously areas of seclusion, tranquillity, nostalgia and cultural events, are now becoming crowded with hotels, tourists, yachts and host facilities e.g. boat rides, water-skiing, parasailing, tiki-huts, parasols, deck chairs, sunbeds, etc. It is a typical case of serious, rapid moving social, environmental and cultural change, for many of the indigenous population of host countries.

To the indigenous person, going to the beach, which was previously a social event with cost only incurred in purchasing food and drinks for consumption, has become a recreational activity, requiring trendy designer accessories and gear (swimwear and sunglasses) at unaffordable prices.

In prime beach areas, open spaces have either disappeared completely or have dwindled to footpaths. Most of the existing footpaths are under pressure to accommodate the expansion of tourism related development or have been removed altogether, especially in high profile, low density, residential areas. Wherever their locations, many of the locals are reluctant to venture onto the beach accesses, because of their poor legibility which gives a feeling of intrusion.

Tourism and other sectors of development, which are expanding on the island, are threatening to destroy those very features which now attract tourists to the island.

This study assesses those impacts with specific focus on ownership, access, safety and

user conflicts in the Grace Bay area of Providenciales. The study also make recommendations for the future, which would ensure a more sustainable approach to tourism related developments.

DESCRIPTION OF THE TURKS AND CAICOS ISLANDS

The Turks and Caicos Islands are located at the extreme southeast end of the Bahamas chain of islands, approximately 575 miles from Miami and 90 miles north of Hispaniola (Haiti and Dominican Republic).

The islands consist of two distinct groups: the Caicos Islands, approximately 60 miles by 30 miles, comprised of South Caicos, Middle Caicos, North Caicos, West Caicos and Providenciales; and the Turks Islands, consisting of Grand Turk (the capital of the entire Turks and Caicos Islands) and Salt Cay. Apart from these major islands, there are numerous other smaller cays.

The total population of the Turks and Caicos Islands is approximately 12,350 persons. Of this total, the majority are concentrated on the island of Providenciales, followed by Grand Turk, with the rest of the population scattered throughout the other islands, with the least on the island of Salt Cay. The island of Grand Turk had the highest population until the early 1980's when the tourism boom began on the island of Providenciales creating opportunities for employment and higher incomes.

The Turks and Caicos Islands are among a few small territories in the Caribbean (Anguilla, British Virgin Islands, Cayman Islands and Montserrat) which are still British Crown Colonies. The Turks and Caicos Islands received its present constitution in 1976. This constitution puts more power in the hands of the local assembly, making the Islands much more masters of their own future and giving the Islands a party system of government, with the leader of the ruling party appointing ministers to various portfolios.

BACKGROUND

The islands, unlike many other Caribbean islands, do not have many natural resources which they can use to generate great economic returns. Compare for example, the mining of bauxite in Jamaica, the production of oil in Trinidad and the agricultural base elsewhere in the Caribbean. The islands do possess, however, an all-year-round warm climate and seaside locations which are suitable for tourism.

The potential for tourism has been recognized and a Turks and Caicos Tourism Development Plan (1986) has been prepared. In addition to the Tourism Development Plan, other plans have been prepared. A National Physical Development Plan (1987 - 1997) has been prepared, accompanied by Local Plans for a number of individual islands. One of the main points

of the proposed development for the islands, as stated in the National Physical Development Plan (1987 - 1997) is that "Providenciales will be the centre of major tourism development. The existing and future investment in hotels, condominiums, resort villas, marinas and commerce will create job opportunities."

In order to secure "the most attractive and economical form of development", the Providenciales Local Plan (1987 - 1997) targeted Grace Bay as one of the few areas where tourism related developments would be encouraged in clusters. The majority of the recreational facilities that tourists expect, such as boating expeditions, scuba diving, fishing excursions, golfing and other sporting activities are all located in the Grace Bay area, as are many of the restaurants and gift shops that cater to tourists. The hotels in the Grace Bay area are Sandals (200 rooms, with plans for expansion), Club Med (300 rooms), Turquoise Reef formerly the Ramada Hotel (228 rooms), Grace Bay Club (96 rooms) and Le Deck Hotel (26 rooms). A 24 bedroom condominium project is nearly completed (The Mansions) and 5 major condominium and hotel projects are currently seeking the necessary planning approvals to commence construction. Together with all the aforementioned tourism related developments, there are many high cost, low density residential developments in the Grace Bay area.

The islands' ecosystems are exceedingly fragile, and the land and sea environments are intimately inter-related. There are extensive and complex biophysical links between terrestrial and marine ecosystems. Therefore, as indicated in the National Physical Development Plan (1987 - 1997): it is essential to consider these ecosystems as linked parts of an integrated environmental system.

The terrestrial environment of the area is not considered to possess any special scientific qualities other than the ground water reserve and the natural landscape whose uniqueness has already been impacted. Therefore it is argued that there are no economic benefits to be derived with the land in its natural state.

PROBLEMS

The welfare of Providenciales ultimately depends on the terrestrial, wetland and marine components of the natural environment. A depletion of productivity in the natural environment would probably result in a diminishment of the life support systems to both human and natural communities. It is the natural environment which ensures continued economic returns for Providenciales, especially from tourism.

Since the early 1980's, Grace Bay has witnessed an explosive growth in tourism related developments. Most of the major projects had either already obtained the necessary planning approvals, commenced construction or been completed prior to 1990, without the submission and implementation of an adequate environmental impact assessment (EIA) study, which would have assessed the socio-economic and environmental components of the particular project.

Until recently, Section 63 (1), of the Physical Planning Ordinance, 1989, was the only section of the legislative and regulative planning framework which explicitly made provisions for the proponents of major development projects to undertake environmental impact assessments. The aforementioned provisions are specially directed towards development in conservation areas. Section 32 (1) (b) of the Ordinance, 1989, gives the Director of Planning the authority to determine at his discretion, whether an environmental impact assessment study shall be required for a project, prior to the assessment and determination of an application(s) for the requisite Detailed Development Permission and Building Permit. The Development Manual, 1995 (Revised April, 1996) makes specific reference to projects for which an EIA study is required. Guidelines and policies are contained within the Manual relating to beaches and coastal areas, environmental protection, beach access and open spaces.

Among the environmental and ecological problems encountered in Grace Bay, are problems of a social nature, including access, ownership and safety, brought about as a result of the development of tourism, without adequate technical and human resources.

Degradation of Beaches from Development too close to the Shoreline

Coastal sand-dunes are very vulnerable geological features which can be easily eroded by over-use or poorly sited development. They are important components of the coastal protection system.

Prior to the implementation of guidelines for development in coastal areas (Section 3.4.2.1 & Chapter 4, of the Development Manual, 1996) and in spite of its current existence, residential and tourism related developments have continually been undertaken callously and insensitively. Notwithstanding the minimum setback of buildings, 60 feet, from the high water mark, the provisions of Section 4.2, of the Manual, permits boat houses and changing facilities to be constructed within the shoreline reservation. The interpretation is that swimming pools are also permitted under the provisions of Section 4.2.

Nearly all developments, hotels, resorts and residential, have their swimming pools, gazebos, dive shops and similar structures located within the shoreline reservation. In the same areas, up to 80 feet back, are sandy soils which formed as a result of accretion. These activities are resulting in the degradation of the sand dunes. The development on land, which formed as a result of accretion, is exceeding the carrying capacity. Hence the loss of sand is already evident as the sea begins to reclaim some of the area, exposing building foundations.

During the construction of residential and tourism related developments, there is a tendency to clear the land totally of all natural vegetation. This includes the building site and the surrounding area. In natural conditions, most sand dunes are stabilized by vegetation. If the vegetation is removed, the dune material is no longer bound by the roots of the vegetation and it is easily moved by wind and water action and erosion results.

Beach Access and Open Spaces

Section 60 (1), of the Physical Planning Ordinance, 1989 and Sections 4.7 & 4.8, of the Development Manual, 1996, make provisions for open spaces or public access areas. These are registered and are indicated on all Block Plans (cadastral maps) of the area. The Department of Environment and Coastal Resources, in cooperation with the National Trust embarked on an ambitious project to erect sign posts on all the beach accesses. Soon after their erection, most of the signs were defaced or removed altogether, reportedly by nearby residents.

Many of the accesses have become footpaths only. Most of the existing footpaths are under pressure and may be lost to tourism and other forms of development, especially in high profile, low density, residential areas. Wherever their locations, many of the indigenous locals are reluctant to venture onto the beach accesses because of their poor legibility which gives one a feeling of intrusion.

Contamination of the Coastal and Marine Environment

The most alarming occurrences, associated with massive growth in tourism related developments in the Grace Bay area, are sewage disposal and the poor drainage of contaminated liquid waste. All future development will require adequate sewage disposal infrastructure and drainage systems to properly dispose of pollutants. Failure to observe this requirement may result in the irreversible pollution of beaches and bathing water and the destruction of marine life.

Many of the older hotels still use the septic tank and soakaway method of sewage disposal. This method will cumulatively impact on the ground water. Currently no testing is carried out to determine the water quality. All the recent hotels (Club Med, Turquoise Reef Resort & Casino Hotel, Grace Bay Club and the Sandals Resort) have treatment plants. The Club Med treatment and disposal system is causing odour problems. This is due to inadequate maintenance and servicing. It is a requirement of the Department of Planning, for all future hotel development to have mechanical treatment plants that are properly maintained during the operational phases of the development.

Destruction of Coral Reefs

In Grace Bay, the reefs are viewed as a commercial resource, a significant asset to the tourism industry particularly for recreational diving and snorkeling. Given the rapid growth and commercialization of the Grace Bay area, it is shocking and appalling that a long-term integrated management plan has yet to be implemented. This is a major cause for concern, since ironically the Princess Alexandra National Park, encompasses the marine environment bordering the Grace Bay area.

There is very little evidence of significant reef and other marine species destruction, but this should not result in us becoming complacent. The Department of Environment and Coastal Resources have recognized potential threats to the nearshore reef systems that can result from tourism activities. These threats include the breaking of coral for souvenirs, anchor damage to reefs from boats and pollutants from the terrestrial environment.

CONCLUSION

The problems associated with the activities outlined above will continue as the growth of tourism increases. How much tourism development is to be planned for in the future will depend upon the islands ability to maintain itself as an attractive tourist destination. The employment and income generated by the tourism sector are greatly needed in the economy. In order for the island to remain competitive in the tourism market, one of the key objectives is for the island to maintain its basic environmental quality. This is often what attracts the tourists in the first place.

RECOMMENDATIONS

1. There is the need for strategic environmental impact assessment as part of the development plan preparation which will redirect incompatible uses to more suitable locations.
2. There is the need for visual quality landscape evaluation in the planning system on the island. The scenic qualities of the coastal landscapes should be protected as a resource which is in limited supply.
3. Large-scale developments should be prohibited from proceeding without proper planning approvals and environmental studies such as environmental impact assessments.
4. The marine environment should be included within an overall planning framework, which would help overcome sectoral thinking. This has led to terrestrial based activities adversely affecting the quality of marine systems and hence, their potential productive use.
5. Strengthening of environmental agencies is required. Bilateral and multilateral organizations must be prepared to provide increased assistance for institutional development.
6. Departments concerned with the management of the natural environment, should develop an integrated approach to planning, thus bringing together the various agencies and users of the resource.

7. Stronger political support from the general populace is needed.
8. Extensive baseline studies need to be carried out in the area so that informed opinions can be made regarding future trends.
9. A plan, encompassing principles of sustainable management, should be compiled and implemented for the Grace Bay area, for use by planners, wardens and other environmental managers.
10. Plans and legislative requirements need to be capable of adaptation to meet changing conditions.
11. The training of enforcement officers to a minimum level of first degree shall be mandatory in order to attract competent individuals.
12. Technical assistance is needed for updating and revising existing planning policies relating to coastal areas.
13. Adequate financial resources need to be made available to the management agencies and departments.

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