



Linking the Social with the Natural

a socio-economic review of Shoal Bay and Island Harbour, Anguilla

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The results of this study are an amalgamation of information provided by a multitude of individuals and agencies who clearly recognise not only the value of their work as it promotes the current and future development of Anguilla, but also of the importance of the network of so many other such individuals and agencies who support them. We drew on the knowledge and expertise of government departments, local businesses, and representatives who are closest to the tourism industry and the natural environment. We would like to thank Lori-Rae Alleyne-Franklin of the Statistics Unit (GOA), Matthew Billington of Shoal Bay Scuba, Gina Brooks-Hodge of the Anguilla Tourist Board, Mimi Gratton formerly of the Anguilla Hotel and Tourism Association, Ernest Harrigan of Uncle Ernie's, Wilken Harrigan, Kathy Haskins and Jackie Cestero of Shoal Bay Villas, Maria Hawkins of Arawak Beach Inn, Eustace Hodge, Karim Hodge of the Department of Environment (GOA), Damien Hughes of the Anguilla National Trust, Albert Lake, Kerriel Lewis of the Department of Lands and Surveys (GOA), Davis Lloyd, Vincent Proctor of the Department of Physical Planning (GOA), Monique Rey of the Anguilla Health Authority, Euton Smith of Smitty's, Hope Webster, and Ross Webster.

Members of the communities of Shoal Bay and Island Harbour as well as the businesses that operate within them and the visitors who spend time there provided us with invaluable information that forms the true basis of this study. We wish to thank these communities and individuals for their openness and patience. We hope that this study will help us as we work together to ensure the sustainability and health of this precious part of Anguilla.

This study would not have been completed had it not been for the individuals who helped us collect this socio-economic information. Thanks are extended to the staff of the Department of Fisheries and Marine Resources for their assistance. And to the Albena Lake Hodge Comprehensive School Environmental Club – led by two dedicated teachers, Ms Joselyn Theophile-Richardson and Mrs. Maxine Alonso, a motivated and hardworking group of students volunteered many Saturdays to conduct resident and visitor surveys. These students represent Anguilla's future – and it is because of young people like them that this future should prove to be a bright one. Many thanks.

Executive Summary

Most socio-economic information collected in Anguilla, a small island in the Eastern Caribbean island chain, is centred around demographic and employment data. Very little information is available on natural resources use. As a country that relies heavily on the natural environment, without such socio-economic information, it becomes exceedingly difficult for natural resources managers to develop, implement, and enforce plans of action that regulate use and that work towards conservation. Indeed, this is reflected in the current management situation of Anguilla's marine parks.

The island's five marine parks were enacted under the Marine Parks Act of 1982 and supported by the Marine Parks Regulations of 1993. The impacts of limited enforcement of legislation and regulations and of inconsistent management are evident – the coral reef ecosystems that are meant to be protected and conserved continue to degrade. To better address both the anthropogenic and natural stressors that are exerting pressure on this fragile coastal environment, more scientific and socio-economic information must be collected. It is within this context that a socio-economic assessment of one of Anguilla's marine parks, Shoal Bay-Island Harbour Marine Park, was conducted.

Shoal Bay-Island Harbour Marine Park is one of Anguilla's most popular coastal areas. Lined with a nearshore reef system that extends east to west from one end of Island Harbour to the other end of Shoal Bay, the area's popularity is matched with a high level of use and much diversity in that use. That is, it is a site that is being impacted by coastal development pressure, a wide range of tourism-related activities, and a relatively high level of fishing.

As a multiple-use area without a functioning

management plan, stakeholder conflict has always been an issue. In an effort to collect information that could contribute to the development and implementation of an effective management strategy for the Shoal Bay-Island Harbour Marine Park, the Anguilla National Trust (ANT) and the Department of Fisheries and Marine Resources (DFMR) embarked on a socio-economic assessment of the area between August 2005 and April 2006. The main objectives of the assessment were: to determine the level of public awareness regarding the marine park; to determine and document the various uses of the area; to quantify the level of activity within marine park boundaries; to gauge the level of community support for a functioning marine park; and to assess the level of management capacity of marine park stakeholders. The socio-economic assessment was conducted based on guidelines proposed by the Global Coral Reef Monitoring Network (Bunce *et al*, 2000; Bunce and Pomeroy, 2003) and included (but was not limited to): preparatory activities; planning and reconnaissance; field data collection; and data analysis. Information was collected via literature review, survey/questionnaires, and semi-structured interviews.

As a small island developing state with a population of just over 11 000, Anguilla's economic success is relatively new. Moreover, this success has primarily been the result of the rapid development of its tourism industry that has been highly dependent on the state and ecological integrity of the island's natural coastal resources (including its sand, waters, and coral reefs). Indeed, the island's tourism industry alone has contributed over 25% annually to the country's gross domestic product (GDP). At the same time, while it may seem like a small percentage, the fishing industry contributes, on average 2.5% annually to the GDP. The significance of this figure becomes more apparent

when it is acknowledged that the industry employs approximately 400 individuals. While there is some diversity in both the level of fish catch and in species targeted, the lobster fishery is the most profitable fishing sector in Anguilla and it is the mainstay of the majority of fishers in the Island Harbour village.

Located on the northeast coast of Anguilla, the Shoal Bay and Island Harbour communities are inhabited by 439 people. Though multicultural in the sense of the various Caribbean nationals (amongst other European and North American ex-patriots) living in both villages, there is a distinct Irish influence – particularly in Island Harbour. This influence, dating back to the late 1600s has resulted in the mixed ethnicity of the majority of the local residents.

Along the coastal perimeter (excluding the Island Harbour bay area), the communities appear affluent because of the array of luxury homes. Once in the interior of the village, however, both Shoal Bay and Island Harbour are relatively average (middle class) in terms of household income and are not particularly dissimilar from the rest of the island. At the same time, with an average 3.0 individuals per household, the inhabitants of the area reportedly enjoy what appears to be a comfortable standard of living.

The majority of the population of the two communities lives in Island Harbour – Anguilla's main fishing village. While employment figures by industry reflect this emphasis on fishing, the Shoal Bay-Island Harbour area is actually second only to West End in terms of the level of tourism development. Indeed, the Shoal Bay-Island Harbour area has undergone significant tourism-related changes within the last thirty years with several holiday homes, hotels, and villas now lining the shoreline. Such development is consistent with Anguilla's up-market tourism appeal. Moreover,

numerous restaurants ranging from fine dining to the casual atmosphere caters to locals and visitors alike. The area is also nationally and internationally recognised for its pre-Columbian history with two sites of historical, archaeological, and cultural significance (Big Spring Heritage Site and Fountain Cavern National Park) found there.

Although the area has, for the most part, consistently enjoyed high tourist visitation numbers, there was a notable decline during the mid- to late-1990s when the island was struck by two severe hurricanes, Hurricane Luis in 1995 and Hurricane Lenny in 1999. The hurricanes caused significant flooding (Hurricane Lenny), disabled key infrastructure and utilities, and devastated critical coastal environments (sand dunes, mangrove forests, seagrass beds, and coral reefs). Indeed, residents have maintained that the condition of the area's coral reefs and beaches are in worse condition today than they were ten years ago. Despite this and the fact that ecological recovery has been exceedingly slow (even after eleven years), many tourist operators continue to consider the Shoal Bay area as one of the top places to visit in Anguilla, the region, and the even world.

Residents' observations regarding the health of Anguilla's coastal environment is indicative of the general findings and trends of this study which also highlight the limitations of natural resources and areas management. The study showed that the level of awareness amongst the public concerning the marine park area, status, and regulations was low. Therefore, there is a clear need for public education which should, in turn, support increased local participation in the management of Shoal Bay-Island Harbour Marine Park and, more broadly, in Anguilla. Environmental officials and representatives, both governmental and nongovernmental, have agreed that public awareness

(or lack thereof) is an issue and acknowledge the need for the engagement of stakeholders in an open and transparent process that will build local management capacity. Such cooperation and collaboration has become increasingly important in recent years as activities occurring within the Park have become much more diverse and potentially conflicting.

Some of the activities occurring in the Shoal Bay-Island Harbour area, as identified by key informants, residents, and visitors, include (but are not limited to): swimming; diving; sunbathing; beach walking; beach sports; water sports (for example paddle boating and windsurfing); glass-bottom boat tours; and visits to historical/archaeological sites. While there was agreement over the prohibiting of some activities within the area, such as the removal of or damage to corals, dumping of waste, and driving on the beach, no such agreement existed on a number of other activities, including jetskiing, powerboating, parasailing, waterskiing, and fishing. There is room for discussion and negotiation with regards to some of these activities especially if a comprehensive zoning strategy within the Park were to be developed. Indeed, the development of a zonation plan has gained the support of both government and nongovernment agencies and individuals. Key stakeholder representatives also agree with the implementation of a zoning plan and further maintain that if developed and implemented appropriately, it could also address potential safety issues and concerns.

Managing the design and implementation of a zonation plan, and of marine parks in general, has been discussed since at least 2001 by environmental agencies in Anguilla. Although these agencies are now in the view that the parks may be best managed by an organisation such as the ANT, a significant percentage of residents of the two villages maintain

that the Government of Anguilla should maintain overall management responsibility. Others, meanwhile, are under the impression that either the community should play the lead role or that management should fall under the auspices of a body comprised of various stakeholder representatives (including government and nongovernment).

The idea of a collaborative approach to natural resources and areas management has become increasingly popular over the last twenty-five years. The success of such a management system, however, is highly dependent on the level of awareness, understanding, and capacity of all stakeholder representatives involved. The results of this study indicate that Anguilla is not in the position to devolve responsibility of marine protected area management to primary users of the resource (that is, the communities) – at least not yet. Moreover, this may not actually be the most appropriate management system for this particular area or for the island. Government and nongovernmental agencies such as the Department of Fisheries and Marine Resources and the Anguilla National Trust should, nevertheless, embark on a comprehensive public environmental education campaign using a variety of media. This campaign should raise awareness about the marine and coastal environment, the interconnectedness of terrestrial and aquatic ecosystems, and marine park objectives and management. Moreover, these agencies must also seek to change the way the public views their relationship with the natural environment that surrounds them and to convert this new way of thinking into positive action. It may not be easy but it is necessary and it must be based on understanding the needs and perceptions of natural coastal resources stakeholders – a process this study hoped to at least begin.

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Introduction

The Anguilla archipelago, located at 18°50'N, 63°50'W, is the most northerly Leeward Island. The archipelago is comprised of a main island and several offshore cays including Anguillita, Dog Island (and its associated islets), Sandy Island, Prickly Pear (East and West), Scrub Island, Little Scrub Island, and Sombrero Island. As a small limestone-based island, the mainland covers a total of only 91km² of land. In comparison, its marine and coastal areas (including its extended fishery zone [EFZ]) encompasses approximately 85 500km². With its small landmass and the integrated nature of its terrestrial and nearshore ecosystems, the entire island could still be classified as “coastal.” Indeed, its coastal zone is reflective of a typical tropical nearshore environment and is comprised of an interdependent system of salt ponds, limited mangrove stands, extensive coral sand beaches, patches of seagrass beds, and relatively diverse coral reefs.

Over the last 20 years, Anguilla has undergone notable and rapid economic and physical development. Between 1985 and 2005, economic activity increased from EC\$47 million to EC\$354.94 million¹ (GOA Statistics Unit, 2006a). This 7.5-fold increase can be largely and directly attributed to a dramatic expansion of the tourism industry and of the other related and supporting industries and sectors (including construction). The direct and indirect impacts of such development on the island has been significant and has been manifested in the overexploitation of natural resources, the destruction of sensitive habitats, eutrophication of coastal waters from grey water and sewage seepage, the erosion of beaches, the displacement and mining (legal and illegal) of sand, siltation, dredging, and physical damage to coral reefs from anchors, divers, and reef walking. At the same time, there has been a

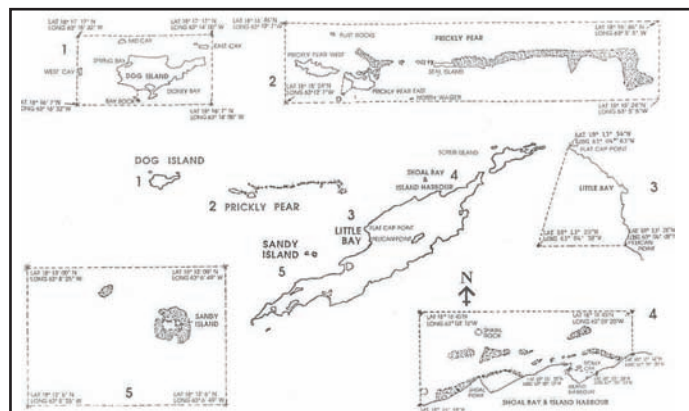


Magellan Geographic, 1997

▲ Anguilla, West Indies.

growing awareness among Anguilla's government and public that the island's reliance on coastal and natural resources and areas requires a form (and level) of development that is both appropriate and sustainable. Translating this awareness into calculated action, however, has been difficult and slow. At the same time, although there continues to be significant environmental degradation and a disjoint between regulations and enforcement of those regulations, some progress in ecosystem conservation has been made, namely in the field of protected areas.

In 1993, five marine protected areas (MPAs) were established in Anguilla's nearshore area. All



Department of Fisheries and Marine Resources

▲ Anguilla's marine parks.

¹ Exchange rate: USD1.00:XCD2.7169

five of these marine parks are located on the north-northwest side of the island. Three of the marine parks surround the offshore cays of Dog Island, Prickly Pear, and Sandy Island while the remaining two lie adjacent to Anguilla's mainland at Little Bay and Shoal Bay-Island Harbour. The Department of Fisheries and Marine Resources is responsible for enforcing the single set of regulations and legislation under which these marine parks were established. Specific sub-zones within the marine parks with their own regulations do not yet exist although there are areas where anchoring is prohibited and where mooring buoys have been installed.

Anguilla's marine parks were enacted by the Marine Parks Act 1982 (GOA, 2000d) and are further supported by the Marine Parks Regulations 1993 (GOA, 2000b). With most of Anguilla's environmental legislation, however, currently either being drafted or redesigned, the Marine Parks Act and Regulations are also being reviewed.

According to the Marine Parks Act (GOA, 2000d), the marine parks were enacted in an effort to:

1. Protect the fish, flora, fauna, and wrecks;
2. Preserve and enhance the natural beauty;
3. Promote the enjoyment by the public; and
4. Promote scientific study and research.

More specifically, and according to the Marine Parks Act and Regulations (GOA, 2000b; GOA, 2000d), the marine parks were enacted in an effort to protect sensitive habitats from anchor damage. Other restrictions in place include the banning of fishing by non-residents as well as filming, camping, and the removal of marine flora and fauna without permit and/or permission of the Officer in charge of the areas.

Over the last ten years, and particularly since Hurricane Luis in 1995 and Hurricane Lenny in 1999, the benthic habitat of Anguilla's nearshore (including those areas within the marine parks) has been drastically affected and altered. Anecdotal and

survey evidence indicate that the coral reefs suffered pronounced damage and seven years after the last major hurricane, recovery has still been exceedingly slow.

While the marine parks had been established primarily for conservation reasons and for regulating use in sensitive habitats, given the changes that have happened to the island's nearshore environment, it is not clear whether these sites still represent the most ecologically valuable parts of Anguilla's marine waters or whether they are still capable of being effective. More information – both ecological and social – is required in order to determine how successful the marine parks have been – and can be – as conservation and multiple use areas.

It is clear that coastal and nearshore environments are not entities upon themselves. They are affected by both natural and anthropogenic stressors with the extent of those stressors often being compounded by one another. While human beings may not necessarily be able to control natural processes, cycles, and systems, we can control our own actions – or at least be able to modify our behaviour and the policies, values, and perception that we structure this behaviour on. Before, however, we can truly understand what needs to be done to conserve our natural resources and areas, we must first understand both our actions and the consequences of those actions – as they were in the past and as they currently stand.



Purpose of Study

Most socio-economic information on Anguilla centres on demographic and employment data – population size, age, gender, ethnicity, religion, level of unemployment, occupation, infrastructure, and facilities. Information on natural resources and area use is limited. Data on the nearshore, coral reef, and marine park use are almost nonexistent. Limited information makes management of these resources and areas and enforcement of relevant regulations, legislation, and policies difficult – particularly of those areas that have been identified as in need of special management, namely, Anguilla's five marine parks. Given this apparent information gap, from August 2005 to April 2006, the Anguilla National Trust (ANT) and the Department of Fisheries and Marine Resources (DFMR) (Government of Anguilla [GOA]) conducted a socioeconomic assessment of the communities that border one of Anguilla's most popular coastal areas – the Shoal Bay-Island Harbour Marine Park.

The goal of the assessment was to collect and document baseline socio-economic data of the Shoal Bay-Island Harbour Marine Park. Objectives of the study were five-fold:

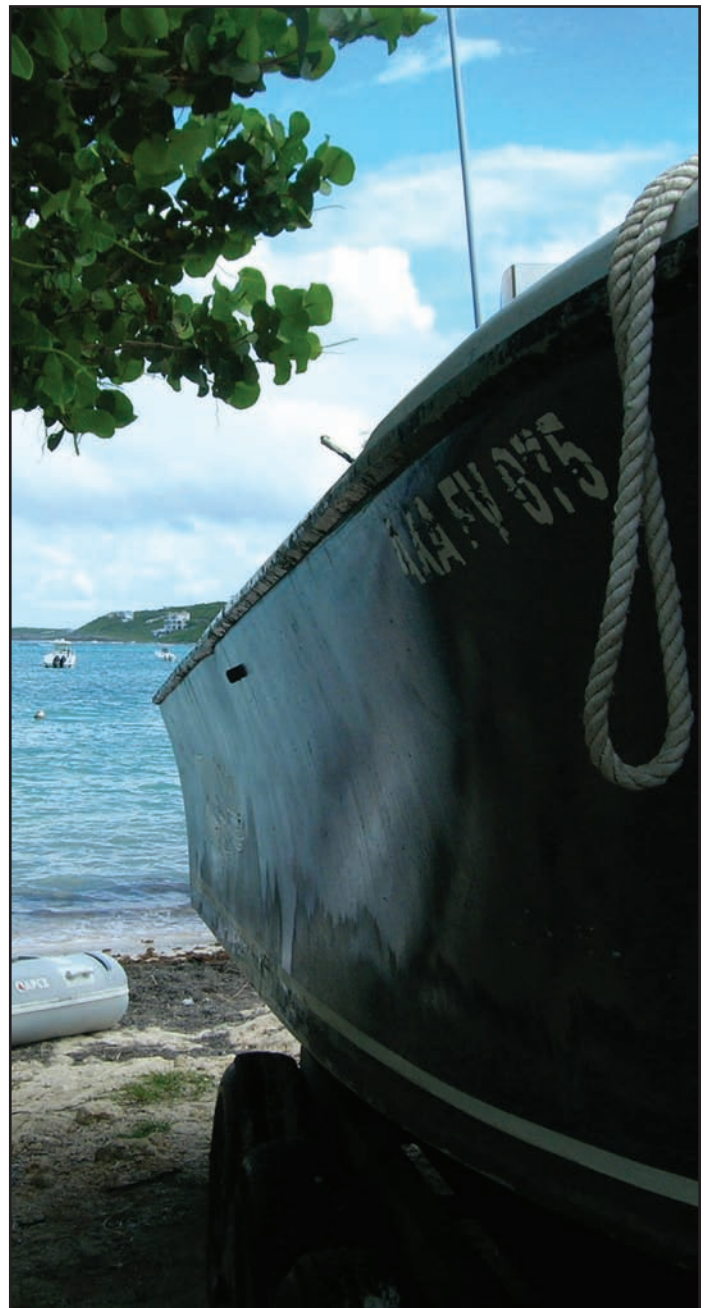
1. To determine the level of public awareness (Anguillians and visitors) regarding the marine park;
2. To determine and document the various uses of the marine park;
3. To quantify the level of activity (including, but not limited to, fishing, diving, snorkelling, swimming, and boating) within the marine park boundaries;
4. To gauge the level of community support for a functioning marine park; and
5. To assess the level of management capacity of marine park stakeholders.

From these main objectives, three additional and equally pertinent sub-objectives emerged, namely:

1. To determine stakeholder perspectives on

the development of a zonation plan for the marine park;

2. To determine the level of support for a complete ban on spearfishing within marine park boundaries; and
3. To determine the level of support for the introduction of user fees for activities conducted within the marine park.



Farah Mukhida, 2006

Method

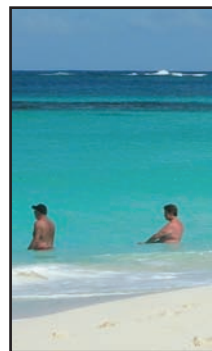
Overview

The socio-economic assessment was conducted based on the guidelines provided by the Global Coral Reef Monitoring Network (Bunce *et al*, 2000; Bunce and Pomeroy, 2003). The entire assessment process was divided into four distinct steps which involved (but were not necessarily limited to):

1. Preparatory activities:
 - a. Identifying the study site;
 - b. Defining the goals and objectives;
 - c. Determining the process that will be used to conduct the socio-economic assessment;
 - d. Identifying the stakeholders and determining the level of their participation;
 - e. Identifying the parameters; and
 - f. Identifying the assessment team.
2. Planning and reconnaissance:
 - a. Accessing the secondary data; and
 - b. Planning how to conduct the field data collection phase.
3. Field data collection:
 - a. Conducting the field surveys and interviews.
4. Field data analysis:
 - a. Analysing the data; and
 - b. Writing the final report.

Preparatory Activities, Planning, and Reconnaissance

The Shoal Bay-Island Harbour Marine Park was selected as the study site based on a number of criteria. Coastal development pressures in the form of villa and resort construction, tourism-related use (swimming, snorkelling, and other watersports), and fishing activities (spear-fishing, fish and crayfish potting, and hook and line) are all occurring within a limited area and all are having an impact not only on the environment but also on each other). As a multiple use area without a functioning management plan, stakeholder conflict is always an issue. Understanding the roles and impacts of each of these activities and the stakeholders that participate in them is critical to the development and implementation of an effective marine park management plan that both integrates stakeholders into the process and conserves the natural environment.



Farah Mukhida, 2006



Farah Mukhida, 2006



Farah Mukhida, 2006



Farah Mukhida, 2006

▲ The Shoal Bay-Island Harbour area is renowned for its clear and clean blue waters, mile-long white sand beach, and quiet atmosphere. ▶

Field Data Collection

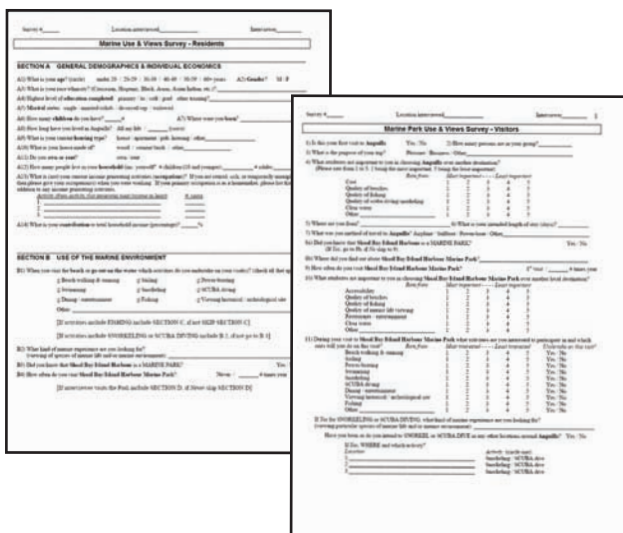
With a focus on the coastal communities bordering the marine park (Shoal Bay village and Island Harbour village) as well as on the non-Anguillian visitors who spend time in the area and particularly on Shoal Bay beach, this study used three main methods of data collection.

Two separate surveys for residents and visitors were designed and conducted and meetings with key informants were held.

Surveys/Questionnaires

Resident Survey/Questionnaire

Surveys were administered based on a random sampling of the Shoal Bay and Island Harbour communities with more emphasis placed on the latter, more residential village. Seventy-five households (35% of the area's total households) were sampled over a two-month period (January to February 2006) (Appendix 1).



▲ Marine Use and Views Surveys - Resident and Visitor.

Visitor Survey/Questionnaire

Surveys were administered based on a random sampling of non-Anguillians visiting Shoal Bay beach. A total of 225 surveys were completed during both the low and high tourist seasons (June to October and November to May, respectively). Percentage of the sampled visitor population is unknown as no statistics are kept on the total number of people visiting specific sites on Anguilla (Appendix 2).

Key Informant Interviews

Key informant interviews were semi-structured and based on a set of open-ended questions. Twenty key informants were selected from a broad range of Shoal Bay-Island Harbour Marine Park stakeholders. The

Box 1

Key informants and their affiliations

- Lori-Rae Alleyne-Franklin -Chief Statistician, Statistics Unit, GOA
- Matthew Billington -Owner and Operator, Shoal Bay Scuba
- Gina Brooks-Hodge - Deputy Director of Product Design, Anguilla Tourist Board
- Jackie Cestero - Manager, Sandpiper's Beach Restaurant and Bar
- Mimi Gratton - Former Director, Anguilla Hotel and Tourist Association
- James Gumbs - Director, Department of Fisheries and Marine Resources, GOA
- Ernest Harrigan - Owner, Uncle Ernie's
- Wilken Harrigan - Fisher, Island Harbour
- Kathy Haskins - Manager, Shoal Bay Villas
- Maria Hawkins - Manager, Arawak Beach Inn
- Eustace Hodge - Pastor, St. Andrew's Anglican Church
- Karim Hodge - Director, Department of Environment, GOA
- Damien Hughes - Executive Director, Anguilla National Trust
- Kerriel Lewis - Surveyor, Department of Lands and Surveys, GOA
- Davis Lloyd - Pastor, The Hilltop Baptist Church
- Vincent Proctor - Principal Planning Officer, Department of Physical Planning, GOA
- Monique Rey - Nurse, Anguilla Health Authority, GOA
- Euton Smith - Owner, Smitty's Seaside Saloon
- Hope Webster - Fisher, Island Harbour
- Ross Webster - Fisher, Island Harbour

purpose of the interviews was to generate specific and in-depth information. They also provided a forum for stakeholder representatives to express their views

and to discuss the issues that they also considered relevant and/or of concern (Appendix 3).



James Gumbs, 2006

Discussion

The National Context

Topography and Geology

Located at 18°50'N, 63°50'W, Anguilla's land area totals 91km². It is bordered by the Atlantic Ocean to the north and east and by the Caribbean Sea to the south and west. High coastal cliffs line Anguilla's northern shores. Its highest point, North Hill, reaches almost 62 metres. Anguilla's southern shorelines, meanwhile, are significantly lower and are characterised by extensive white sand beaches. The island's submarine shelf is shared with Saint Martin/Sint Maarten and Saint Barths and much of it descends between ten and twenty fathoms (Jackson, 1981).

The island is predominantly comprised of marl that developed from old igneous (volcanic) rocks and limestone. This limestone base is porous and prevents significant accumulation of water on the surface. Indeed, there are no surface streams or lakes. Instead, the freshwater, for the most part, remains subterranean and layered on top of the heavier and deeper salt water. There are, however, 25 saltponds on the island that may have originated from the closure of former bays (Jackson, 1981). Most are brackish – receiving freshwater from rainfall and saltwater from underground sources.

Climate

Anguilla's dry tropical marine climate is influenced by a wet season that extends from June to November which also coincides with the Atlantic hurricane season. Most winds are easterly, although they may also blow from the northeast, east-southeast, and south at speeds ranging between 15 and 20km/hr (Hodge, unpub.). Monthly mean temperatures measure at 82°F and rainfall averages at 37.73 inches. Low levels of rainfall and a relatively flat landscape

has made runoff less of a concern for Anguilla's nearshore environments than other more mountainous Caribbean islands. Impacts, however, are felt among the island's saltponds as salinity levels tend to fluctuate dramatically between and during the wet and dry seasons. Such changes affect not only the water levels of the ponds, but also the organisms that use these areas for feeding and habitat (Jackson, 1981).

Jackson (1981) describes Anguilla's coastal currents as predominantly flowing northeast to southwest in a longshore movement over the Anguilla platform. These currents affect coastal sand movements on, off, and between beaches – both on the mainland and the offshore cays.

Landscape

Given Anguilla's small size, the entire island could be characterised as “coastal.” Its habitats reflect its tropical but dry nature and include low-lying scrublands, scattered woodlands, clustered mangrove forest stands, seagrass beds, and coral reefs. These habitats, particularly the latter three, have been affected by hurricane and strong storm damage as well as by the impacts of tourism and coastal development.

Once-rich coral reefs that were relatively diverse and teeming with life were severely degraded in 1995 after Hurricane Luis struck the island. The hurricane reportedly devastated over 60% of the island's live corals and approximately 45% of its seagrass beds. *Acropora palmata* (elkhorn coral) reefs were destroyed, thereby contributing to coastal erosion since this natural breakwater was, in effect, removed (Hoggarth, 2001). Mangrove stands, that were limited in area to begin with, were virtually eliminated with mortality rates of red, black, and white mangroves ranging from 68% to 99%. Sand dunes and beaches were severely eroded along most of Anguilla's shoreline

but especially on the northern shores where dunes retreated as far back as 30 metres. Areas that were



Clifford Fleming, 1999



Clifford Fleming, 1999

▲ Anguilla's shoreline after Hurricane Lenny in 1999.

most vulnerable were those that were compounded by additional stresses arising from coastal development (Hoggarth, 2001).

Reports from divers and fishers also indicate much destruction to the offshore reefs. In 1995, recovery of these habitats was expected to be slow (Hoggarth, 2001). Unfortunately, a second major hurricane, Hurricane Lenny, hit the island in 1999 causing additional damage and slowing the habitat recovery process even further.

Eleven years after Hurricane Luis, Anguilla's coastal environments are still struggling to recover. Coral recruitment rates (based on anecdotal evidence and preliminary ground-truthing surveys) are still low and seagrass beds, while starting to regenerate, are still limited. Anguilla's red mangroves are sparse although there are pockets along the coastline that indicate that natural regeneration and rehabilitation is not only possible, but that it is occurring.

Island Demographics

Over the last 40 years, Anguilla's population has increased substantially from 5 810 people in 1960 to just over 11 550 in 2001 (GOA Statistics Unit, 2006b). The male-female ratio is almost 49:51 with 5 628 males and 5 802 females recorded in the 2001 census.

Box 2

Age and gender distribution of Anguilla's population in 2001

Age	Female	Male	TOTAL	TOTAL + Missing
0 - 14	1 590	1 612	3 202	3 233
15 - 64	3 632	3 724	7 356	7 456
≥65	406	466	872	872
TOTAL	5 628	5 802	11 430	11 561

(GOA Statistics Unit, 2006b)

Despite the increase in overall population, much of Anguilla – particularly the inland areas – are sparsely populated. Based on the 2001 census, population density was highest in the villages of South Hill, The Valley, North Side, The Quarter, and Stoney Ground. Largest population growth, meanwhile, occurred in The Farrington (80% increase), North Side (79% increase), and The Quarter (50% increase). Much of this increase could be attributed to in-migration from other Caribbean countries (GOA Statistics Unit, 2006b).



Farah Mukhida, 2006



Farah Mukhida, 2006

▲ Mangrove regeneration in Little Harbour, Anguilla.

Island Economy

Economic development began in earnest on the island after its formal secession from the Associate State of St. Kitts-Nevis-Anguilla in 1967 (Mitchell, 2006) and after a concerted effort to develop the tourism industry. Based on the concept of "sea, sun, sand, and seclusion," Anguilla sought to develop a tourism product that was high-end and high-market.

Anguilla's economic success has been relatively new. It has only been over the last 25 years that there has been a significant increase in the country's gross domestic product (GDP), standard of living, and perceived quality of life. The GDP has tripled to approximately EC\$240 million over the last 15 years alone. Mean household and per capita incomes now stand at EC\$47 000 and EC\$14 000, respectively (GOA Statistics Unit, 2006c).

Unemployment rates are relatively low at 8% (GOA Statistics Unit, 2006c). Indeed, sourcing workers from the Anguillian employment pool to support the burgeoning tourism industry (and its supporting sectors) has become increasingly difficult – there is a short supply of Anguillian workers required to fill the number of positions that have become available, particularly in the construction sector. Workers from other Caribbean islands and from countries as far away as the Philippines and Southeast Asia have been recruited to fill these positions. With a substantial increase in population and especially in migrant populations (28% of the population in Anguilla is non-Anguillian [GOA Statistics Unit, 2006b]), comes a number of social, cultural, economic, political, and environmental implications that need to be (but not always are) considered.

According to 2002 economic activity figures, hotels and restaurants accounted for 27.8% of the country's

GDP. This was followed by government services (18.2%), banking and insurance (14.5%), and construction (10.3%). Activities such as fishing, agriculture, and harvesting of natural food products are low in terms of contribution to the GDP and the level of activity when compared to the other industries. At the same time, however, they still contribute 3% to the GDP (GOA Statistics Unit, 2006c).

Between 1992 and 2002, the annual GDP growth rate averaged 3.57%. Between 1983 and 1992, this figure was significantly higher at 9.99% (Hodge, unpub.). Hodge (unpub.) states that this decline could potentially be attributed to the active hurricane seasons that plagued the country from 1995 to 1999. Anguilla clearly is, for the most part, a single-industry economy. While some efforts to diversify have been made especially in off-shore financing, having an economy exceedingly dependent on tourism has placed (and continues to place) this small island in a vulnerable economic position.

Coastal Economy

Tourism

Although Anguilla's interior is primarily low-lying scrub comprised of unassuming hardy and relatively drought-resistant plants, its shoreline provides a spectacular contrast. With still un-crowded white sand beaches speckled with palm trees and beach chairs and bordered by clear turquoise waters, Anguilla is an escape from the hectic lifestyles of many of its visitors. While Anguilla provides the "sea, sun, sand" experience of other Caribbean islands, it also offers seclusion. Its high profile visitors come not only to the island for luxury and indulgence, but also for its friendly and respectful people. Anguilla markets privacy.

According to the Anguilla Tourism Marketing Plan

and Promotion Programme (Coopers & Lybrand Consultants Inc, 1995, 8), Anguilla's competitive edge over other Caribbean destination lies in its:

1. Excellent climate;
2. Highest quality of beaches in the world;
3. Warm friendly people;
4. Easy internal accessibility;
5. Lack of pollution;
6. Diverse high quality dining and accommodations;
7. British/French/Dutch colonial heritage customs and rule of law;
8. Political stability and lack of crime;
9. Excellent telecommunications;
10. Up-scale exclusive image and favourable perception in the marketplace; and
11. High levels of visitor satisfaction as manifested in the high levels of repeat business.

In addition to these attributes, Anguilla is also effectively marketed.

Over the last 15 years (1990 to 2005), the number of visitors to the island increased by 58% from 90 506 visitors to 143 186 (GOA Statistics Unit, 2006d). This represents a 99% increase in total number of tourists (from 31 181 to 62 084) and a 37% increase in total number of excursionists or day trippers (from 59 325 to 81 102).

Between 1990 and 2005, the number of visitors arriving in Anguilla has increased significantly. During this period, however, there were some notable declines - particularly in 1996, 1999, and 2001 - the year after Hurricane Luis, the year of Hurricane Lenny, and the year of the terrorist attacks on the World Trade Centre and the US Pentagon.

The substantial increase in visitor numbers does not necessarily reflect an equally dramatic increase in available accommodation. Indeed, according to published statistics, accommodation by rooms available actually fell by 174 rooms from 920 in 1992 to 746 in 2005. At the same time, the decrease reflects higher occupancy rates in the latter years (GOA Statistics Unit, 2006d).

Average length of stay for tourists while only fluctuating by two days over ten years, also decreased from 9.4 days in 1996 to 8.1 days in 2005 (GOA Statistics Unit, 2006d). Over the last 15 years (1990 to 2005), Americans (tourists and excursionists) have consistently comprised the majority of visitor arrivals, with an average 52% share. Visitors to Anguilla have also arrived from (including, but not limited to) Canada, the United Kingdom, Italy, Germany, other European countries, the French and Dutch West Indies, and a number of other Caribbean islands. These visitors have the choice to stay in one of Anguilla's 45 resorts and villas and with over 100 restaurants across the island to choose from, there is something to please every palette.

Despite significant and annual increases in visitor arrivals, it is still the hope and expectation of both the



Government of Anguilla and the Anguilla Tourism Board (ATB)² that the industry will continue to grow and still provide the product that its customers have come to expect and appreciate. Coopers & Lybrand (1995) suggest that achieving growth in the industry would require developing products that target specific (and currently relatively untapped) markets, including (but not limited to) the honeymoon, eco- and heritage tourism, and dive markets. Regardless, placing additional emphasis on the natural environment (namely its beaches and waters) as a tourism draw would require ensuring that Anguilla's important natural resources are managed appropriately, wisely, and sustainably across industries and the island.

Fishing

In contrast to the relatively new tourism industry, fishing has always played an important role in the lives of Anguillians. Historically, it has provided a steady source of protein and has been the basis of a healthy diet. More recently, it has become a relatively important contributor to the island's GDP and has employed almost 5% (400 individuals) of the population eligible to work. While the majority of those employed in the industry work part-time, they have still managed to contribute approximately 2.5% annually to the GDP over the last 15 years (GOA Statistic Unit, 2006c).

Prior to the 1980s, fish products had been exported to nearby islands. Following, however, the rapid expansion of Anguilla's tourism industry and an increased demand for seafood products on-island, fish exports decreased from close to 70% during the mid-1980s to below 10% by the early 1990s. Today, near negligible exports are made to nearby St. Martin.

² ATB is the agency responsible for managing the island's tourism industry

Anguilla's fishing industry is concentrated on 2 000km² of submerged shelf of the EFZ. The industry is essentially artisanal and the majority of the boats are open vessels or canoes. The boats range in size from 12 to 50 feet but the majority (86%) are between 15 and 35 feet. All of the boats are powered by engines (usually gasoline twin outboard) and there are currently around 300 such vessels in operation.

The majority of fishing vessels and most of the fishers are at sea between 5 am and 2 pm. There are, however, exceptions. A small number of fishers line-fish close to the shore for several hours at night. There are also one or two vessels that will spend up to 48 hours at sea. Most fishers, however, prefer to operate closer to shore. Due to relatively low inshore catches, however, vessels have been forced to expand their operations to an approximately 65-kilometre radius of the mainland (Hodge, 1993).

Although information on catch effort is limited, targeted fish species in Anguilla include lobsters (both the spiny lobster [*Panulirus argus*] and spotted spiny lobster [*Panulirus guttatus*]), conchs, various reef fishes (snappers, red hinds, coney, and other grouper species, triggerfish, surgeonfish, goatfish, and squirrelfish), and coastal pelagics such as the jack species. To a lesser extent, ocean pelagics such as wahoo, marlin, mahi-mahi, and swordfish are minimally exploited by a few fishers, while the West Indian Top Shell (or whelk as it is locally known) is harvested on a subsistence basis and not sold on the market.

The traditional Antillean fish traps of S, Z, or arrowhead design, are the most widely used fishing gear. Other fishing methods in use are hand lines, long lines, rigs, spear guns, and seine nets. Fishers may also use SCUBA equipment or free dive. There are no large-scale commercial fish processing plants in operation in Anguilla. Only a small private enterprise, owned by a

local fisher, is involved in the scaling and gutting of fish. At the same time, however, fishers have begun to expand into this arena and some are now scaling and gutting fish catch before their products are sold. This is a vast difference to the 1980s (and even earlier) when 90% of all catch underwent no form of processing before being put to market (Jones, 1985).

The Anguillian fishing industry is governed by the Fisheries Protection Act (GOA, 2000c), the Fisheries Protection Regulations (GOA, 2000a), and their subsequent Amendments. These regulations are enforced by the Department of Fisheries and Marine Resources and the Royal Anguilla Police Force with the former playing the lead role. Despite human and financial resources constraints, the regulations are being enforced to a certain degree (Gumbs, 2005b, pers. comm.). Although a significant proportion of the population sampled for this particular study were not aware of the regulations or the work being done to enforce them, 22% still believe that current enforcement levels are at least adequate (ANT and DFMR, 2006a).

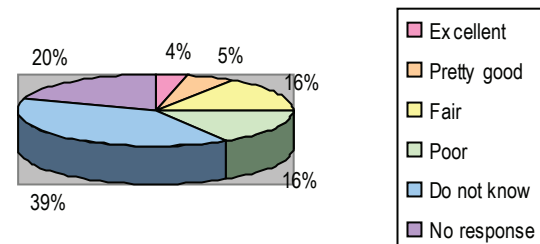
The Local Context

Shoal Bay and Island Harbour Communities

Social Demographics

The Shoal Bay and Island Harbour villages are located on the northeast coast of Anguilla. Extending over 7 kilometres of coastline, the two villages are inhabited (according the 2001 census) by 439 people (232 males and 207 females) (Franklin, 2006, pers. comm.; GOA Statistics Unit, 2006b). Of the area's total population, 308 are above 15 years of age and are therefore eligible to be in the workforce. The first language of the residents is English.

Resident perception about the level of enforcement of Anguilla's fishing regulations



(ANT and DFMR, 2006a)

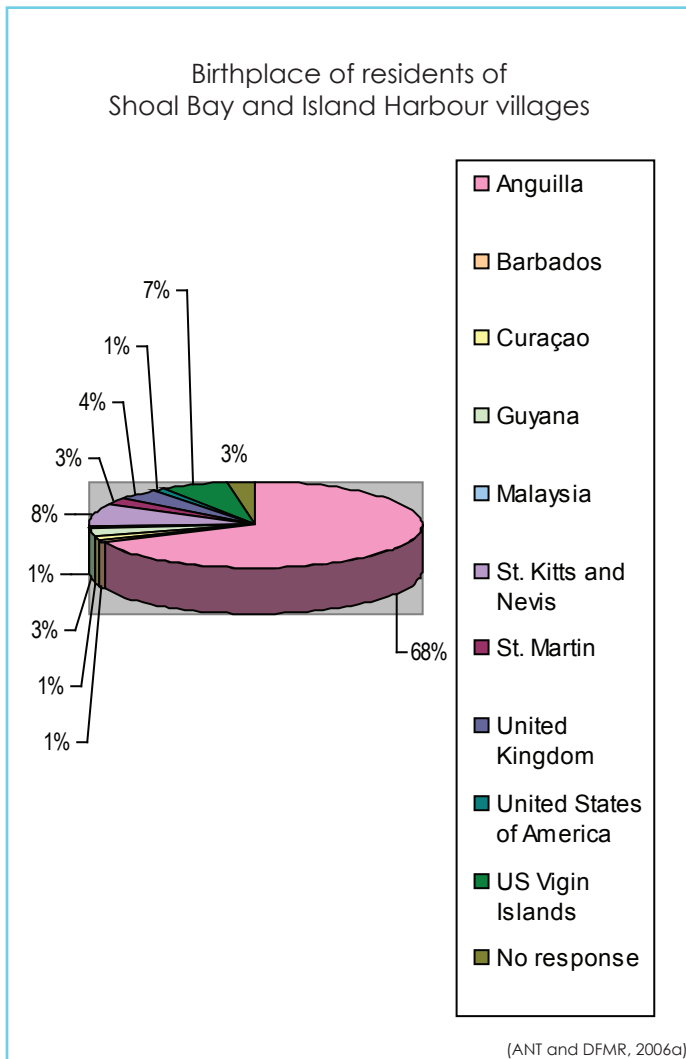
Island Harbour has a significant historical European influence. Mitchell (2006, 2) describes Anguilla's colourful colonial history:

The few canon placed on Anguilla for defence [by the British] in 1666 were removed to St. Kitts, and the island [was] once more left without the means to defend itself. In 1688 the French landed a party of Wild Irish on Anguilla, who treated the defenceless inhabitants more barbarously than any of the French pirates who had attacked them before. If they had been left their canon, we can be sure that the Wild Irish would have had a hot reception, but then we would have been deprived of many of the good folk of Island Harbour: the Ruans, Harrigans, and Bryans.

Given this Irish influence, the majority (83%) of the area's inhabitants are of mixed ethnicity although the majority have identified themselves as black. Caucasians comprise 11% of the population, while Hispanics and East Indians have a small but visible presence at 3% (GOA Statistics Unit, 2006b).

Island Harbour and Shoal Bay are relatively multicultural within the regional context as well. Although the majority of residents were born and raised in Anguilla, individuals have also immigrated to the island from

St. Kitts and Nevis, the US Virgin Islands, the United Kingdom, St. Martin, Guyana, Barbados, Curaçao, Malaysia, and the United States (ANT and DFMR, 2006a).



Of the 141 dwelling units available in the communities, 95 are owned, 35 are rented, and 11 are rent-free (GOA Statistics Unit, 2006b). Most of the units were built between 1970 and 1995 and their architecture reflects the style and design of that period. It is interesting to note, however, that after being hit by severe hurricanes and suffering significant damage during the 1960s and 1970s, construction material used

to build houses shifted from wood to more structurally sound concrete.

According to the 2001 census, most community members/dwelling units are supplied with electricity and water from public sources (GOA Statistics Unit, 2006b). That is, water supply reaches 64 units by pipes fed by the government line while an additional 62 use private cisterns. Meanwhile, 134 units receive power/electricity from ANGLEC – a public company that both Anguillians and the GOA have invested into.

With an average of 3.0 individuals per household and over 130 young people under the age of 15 (almost

▼ The architecture of Shoal Bay and Island Harbour villages has changed over the years - functionally, structurally, and aesthetically. Both design and building materials currently used are more resistant to hurricane damage.



Farah Mukhida, 2006

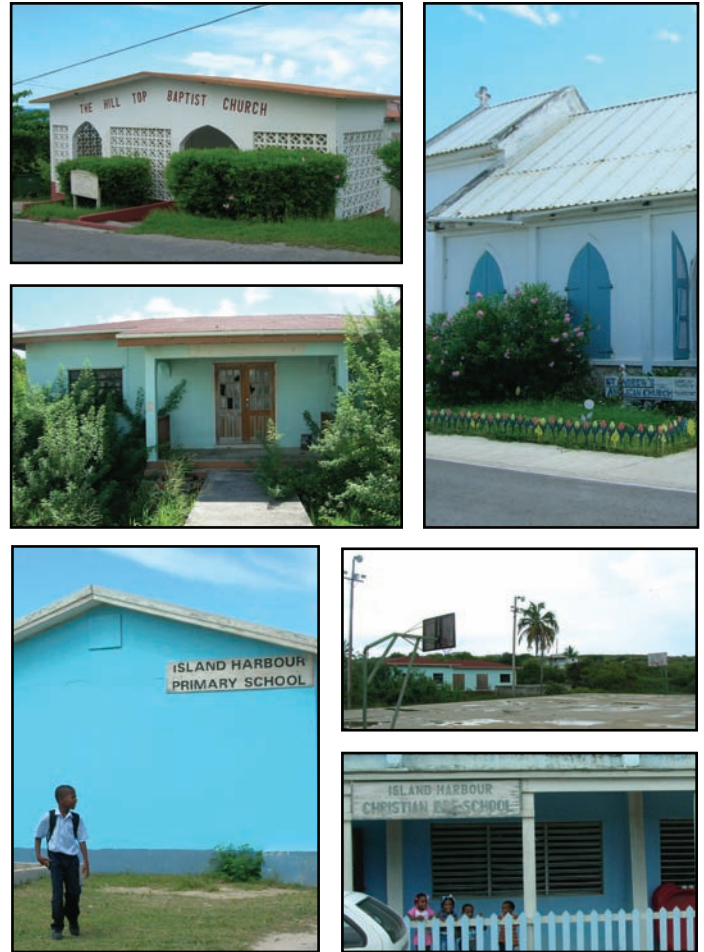


Farah Mukhida, 2006



Farah Mukhida, 2006

a third of the population) (GOA Statistics Unit, 2006b), the two communities are relatively young and have facilities and services that cater to both families and youth. Two churches (one Baptist and one Anglican) have been serving the communities since 1969 (Lloyd, 2006, pers. comm.) and 1956 (Hodge, 2006, pers. comm.), respectively. A health clinic that had been staffed and in operation since the late 1970s was closed permanently in 1999 after Hurricane Lenny devastated the area. The Island Harbour Primary School and the Baptist pre-school provide primary education to the majority of the communities' children who are between 5 and 12 years of age. A basketball court and a playing field (formerly a saltpond that was in-filled during the 1980s) were created to provide recreational opportunities for the youth and other community members.



▲ A few of the facilities found in the Island Harbour community (clockwise from top): The Hill Top Baptist Church, the St. Andrew's Anglican Church, the local basketball court, the Island Harbour Christian Pre-School, the Island Harbour Primary School, and the old health clinic (photos by James Gumbs and Farah Mukhida, 2006)



Two small grocerettes, a French bakery, and a small trinkets store also cater to the communities. Most residents, however, travel a short distance to the capital, The Valley, for their wider needs. Two art studios in Island Harbour alone also contribute to Anguilla's reputation as an island that encourages the arts and that is supportive of an ever-growing artists' community. Furthermore, it complements the village's eclectic mix of local residents.

◀ A range of services and stores can be found in the Island Harbour and Shoal Bay villages (photos by Farah Mukhida)

Over the last 20 to 30 years, quality of life in the Shoal Bay and Island Harbour communities (and indeed the rest of the island) has increased significantly. This increase has been supported by more secure sources of income, electricity, and water and is reflected in an increase in household durables purchased by residents.



Farrah Mukhida, 2006

Over 74% of residents have telephones, 77% washing machines, 87% televisions, and 97% stoves. A small percentage – just under 6% – have invested in alternative energy

sources and are supplementing their electricity supply from ANGLEC with solar panels (GOA Statistics Unit, 2006b) – a figure environmental agencies (government and nongovernment alike) hope will increase substantially in the near future.

The majority of the population of these two communities lives in Island Harbour – one of the island’s main fishing villages. Employment by industry reflects this emphasis on fishing with approximately 76 community members employed in the sector (ANT and DFMR, 2006a)³. Similar to the island as a whole, employment within the finance and business sector continues to grow. Indeed, the finance, real

Data regarding employment by industry is not available for individual communities from the GOA Statistics Unit. The figures provided are estimates based on resident surveys as well as on the total population that is eligible to work. It is important to note, however, that this figure most likely is an underestimate of total fishers living in the village; it is probably significantly higher.

estate, and business services ranks second in terms of numbers employed with over 60 residents of these two villages involved in the sector. Just fewer than 20 individuals, meanwhile, are directly employed in the tourism service industry (ANT and DFMR, 2006).

While a relatively small percentage of the communities’ population is directly involved in tourism, the Shoal Bay and Island Harbour villages are actually second only to West End in terms of tourism development. Several holiday homes line the shoreline and eight hotels and villas aimed at the up-market tourism clientele line the area’s expansive beaches.

Box 3

Employment by sector of Shoal Bay and Island Harbour residents

Percentage of Residents Employed by Sector	Larger Stakeholder Group	Stakeholder Group Subcomponents
140	Livelihood	Artist Carpenter Chef Construction Worker Fisherfolk Housekeeper Mechanic Painter
82	Management	Accountant Engineer Entrepreneur Nurse Police Public Servant Senior Manager/Supervisor
24	Education	Teacher
62	Other	Bank teller Day care worker Home-maker Outside financial support Retail Worker Retired Security guard Unemployed

(ANT and DFMR, 2006a)



▲ Luxury holiday homes and up-market resorts, villas, inns and a wide variety of eating establishments line the shoreline from Island Harbour to Shoal Bay, Anguilla (photos by Farah Mukhida, 2006) ▶



At least ten restaurants that range from the fine dining of Gorgeous Scilly Cay to the laid back atmosphere of Uncle Ernie's to the local Chinese restaurant give both locals and visitors a choice in ambience, cuisine, and price.

To support the relatively high traffic through the area (on land and by water), service stations for cars and boats are found along the main road in the heart of Island Harbour.

Historical Significance

The northeast region of Anguilla is also internationally recognised for its pre-Columbian history. Two sites of particular historical, archaeological, and cultural importance are Big Spring Heritage Site (Island Harbour) and Fountain Cavern National Park (Shoal Bay).

Big Spring Heritage Site was designated an historical and cultural protected area in 2001 by the Government of Anguilla and is currently managed by the Anguilla National Trust. Believed to be a ceremonial site for the post-Saledoid people of the area (c. AD 600), Big Spring is noted for the over 60 petroglyphs that are marked on its limestone walls. Crock and Petersen (1999, 17) describe the site:

The Big Spring site was identified by Island Harbour resident John Lloyd who was the first to notice petroglyphs on the west-facing rock shelf above the spring. In 1988, Lloyd brought the site to the attention of Nik Douglas and the AAHS [Anguilla Archaeological and Historical Society]. Soon thereafter, Douglas and Penny Slinger inventoried a total of 28 significant petroglyphs and sketched each one. The majority of the petroglyphs are composed of three indentations which form faces, many of which have a groove facial outline encircling them...

Big Spring, in addition to being a valuable source of fresh water, also may have served a ceremonial role. Petroglyph sites in the Antilles and elsewhere are often interpreted to be related to Amerindian ceremonial activities and to commemorate sacred sites. Big Spring, like Fountain Cavern, likely held ceremonial importance for the Amerindians, perhaps for those living at the Island Harbour habitation site a short distance to the north.

Fountain Cavern National Park, established in 1985,

meanwhile, is an internationally significant site on the basis of its Pre-Columbian archaeological remains. As a two-chamber cave, each containing a freshwater pool, the area is considered to be both a source of freshwater and an important ceremonial site. Indeed, according to Crock and Petersen (2005),

Fountain Cavern was first publicly recognised as a highly significant pre-Columbian archaeological site in 1979 during a survey of Anguilla by archaeologists sponsored by Island Resources Foundation (IRF) of St. Thomas, USVI. The cave, if not for its Amerindian heritage, was well known to Anguillians who had collected fresh water from the site for decades prior to IRF's initial documentation of the petroglyphs and related cultural deposits.

As early as 1981, the AAHS conducted surface collections of artefacts within the cave, mainly to recover ceramics eroding from the unstable pathway leading down the talus slope...The AAHS collections from Fountain Cavern include a total of 6 604 ceramic shards (Petersen and Wattes, 1991). During the same period, the AAHS also documented the rock art in the cave, sketching and describing 12 of the petroglyphs (Douglas, 1986). The most notable petroglyphs helps form a large stalagmite "statue," that sits above the pool with its carved anthropomorphic head facing the water. All of the other identified petroglyphs are also located in Chamber 1, within the range of daylight entering from the entrance hole in the ground surface above...

Based on radiocarbon dates...the first use of the cave occurred prior to AD 400. More recent styles of ceramics indicate the cave was utilised by Amerindians until at least AD 1200, and probably later. The petroglyphs, the vessel forms represented, and the association between the art, artefacts and freshwater pool all indicate at least eight centuries of ritual use (as opposed to habitation or solely the acquisition of freshwater)...

There are no other known archaeological sites like Fountain Cavern in the Eastern Caribbean/Lesser Antilles and less than a handful of comparable sites exist in the islands of the Western Caribbean/Greater Antilles.

Based on its "outstanding universal value" as "testimony to a cultural tradition or to a civilization which...has disappeared" (UNESCO, 2005, 19) and as a "masterpiece of human genius" (UNESCO, 2005, 19), Fountain Cavern has been nominated for inscription on the UNESCO World Heritage List.



▲ Fountain Cavern National Park, established in 1985, represents one Anguilla's most important cultural and archaeological sites.

The Marine Context

Marine Resources

Shoal Bay-Island Harbour Marine Park's coastal heritage is as colourful as the history, culture, and people of the communities that border it. Anguilla's marine resources were studied in 1990 by Oxenford and Hunt (c.f. Hoggarth, 2001). Three habitat types (patch reefs, hard coral reefs, and seagrass beds) at eight sites around the island, including Shoal Bay, were identified and surveyed. It is important to note that the study was conducted five years before Anguilla was affected by Hurricane Luis. The hurricane caused significant damage both on-land and under the water. Oxenford and Hunt (1990 c.f. Hoggarth, 2001) nevertheless provide critical information that now allows for a comparison in ecological health and integrity and as a base from which to measure the rate of rehabilitation (or the lack thereof) (Hoggarth, 2001).

In 1990, habitat types found in Shoal Bay included algae (common), seagrass (rare), algae and/or seagrass traces (common), shallow reef (common), brown algal reefs (common), soft corals (dominant), montastrea reefs (common), porites reefs (common), mixed reefs (rare), bare sand (common), and submerged rock (rare) (Blair-Myers et al, 1995 in Hoggarth, 2001).

Since Hurricane Luis and Hurricane Lenny, much has changed. The coral reefs – particularly those dominated with *Acropora* and other equally branching-type species – were especially affected. Strong winds, high tides, and strong currents caused much shoreline erosion and siltation (both from coastal runoff and sediment movement along the seafloor). The predominant habitat remains soft coral as the species may have found it easier to recolonise

themselves (as opposed to hard corals) and were probably more resistant to the impacts of the hurricanes. Coral rubble and sandy bottom also now comprise a notable proportion of the seafloor in the Park.

In Island Harbour, a significant turtlegrass bed (*Thalassia testudium*) grows in the waters between the shoreline and Scilly Cay. The water in this area is less than three metres in depth and the seagrass habitat acts as an important foraging site/feeding ground for green turtles (*Chelonia mydas*) (Gumbs, 2005a).



Farah Mukhida, 2006

◀ Island Harbour is considered to be the birthplace of Anguilla's fishing industry. The majority of the boats are open vessels and local fishing effort targets lobster, crayfish, reef fish, coastal pelagics, and, to a lesser extent, ocean pelagics.

Island Harbour is generally regarded as both the birthplace of fishing in Anguilla and the fishing capital of the island. In 1982, a report by Olsen and Ogden substantiates this claim by stating that in 1978, of the then 320 registered fishers in Anguilla, about 150 were from Island Harbour. Currently, records at DFMR indicate that about 22% or 65 of the 300 or so registered fishing vessels in Anguilla operate out of the Island Harbour-Shoal Bay area. While a significant proportion of Anguillian fishers are from these communities, during the mid-1960s through to the early 1990s, only six boats actually operated from Shoal Bay beach. Today, this number has declined even further – no boats operate from this beach as all have relocated to Island Harbour bay (Harrigan, 2006, pers. comm.).

Despite the status of Island Harbour as a fishing village, somewhat surprisingly, there are no fishers' cooperatives or associations in the village. The independent nature of the fishers in Anguilla (which is even more pronounced in Island Harbour) may be a stumbling block to the establishment of cooperatives and may be one of the reasons why the fishing industry has been neglected in terms of development. The fishing sector clearly requires more support from the Government of Anguilla and fishers could have a profound influence in generating that support if they were to come together – especially considering the fact that the demand for fish products in Anguilla far outweighs the supply. Unfortunately, little has changed since Jones (1985) noted 20 years ago that the importance of the fishing industry in Anguilla has yet to be fully appreciated or even acknowledged.

Notwithstanding the perceived neglect of the fishing industry, fishers in Island Harbour and Anguilla, in general, continue to ply their trade and fishing is still considered to be a very lucrative livelihood. This is especially true of the lobster fishery – the most profitable sector. Indeed, the price of lobster has steadily risen from approximately US\$3.00 per pound in 1980 (Olsen and Ogden, 1982) to the current price of US\$10.00 per pound. The contrast in the situation prior to the 1960s is astounding. During this time, a lobster fishery (and market) did not exist and any lobsters caught were used to bait fish traps in order to catch groupers (Hodge, 1993).

Lobster fishing in Anguilla began in earnest in the 1960s in response to export demand from the United States Virgin Islands (Hodge, 1993). Most lobster landings at that time (as well as today) came from the Island Harbour fishers and this had a positive impact on the community. Fishers in general, but lobster fishers in particular, earn an income that is comparable to that of mid- to senior-management civil servants. This

relatively high income is reflected in the community by the size of the houses, the level of outright ownership of those houses, and the number of fishers who own their vessels.

Reflective of the active involvement of the Island Harbour fishing community, 50% of the fishers stated that they participate in lobster fishing. Lobster fishers typically fish approximately 30 weeks out of the year between the months of October and May. Typical lobster catch per week per fisher averages 207 pounds. The average number of times fished per week is 3.3 with 18% of fishers indicating that they fish as much as four to seven times per week (ANT and DFMR, 2006a) (Appendix 4).

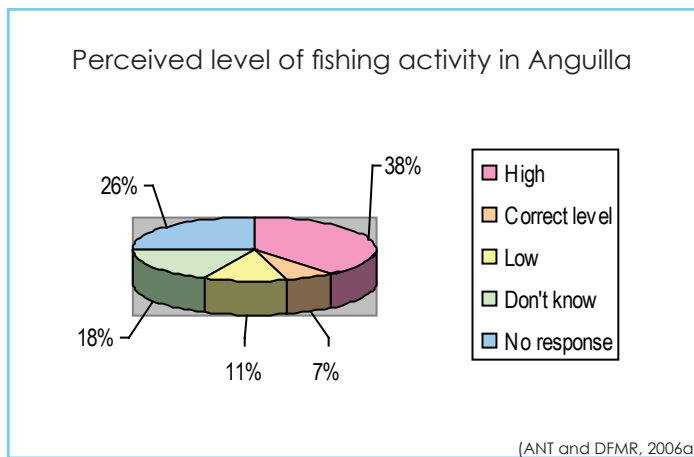
We used to bait fishtraps with lobster.

- Ross Webster, Island Harbour fisher

Despite the relatively high level of lobster fishing and its profitable nature (or perhaps because of it), since the mid-1980s, fishers have been reporting a decline in spiny lobster catches (Jones, 1985). Indeed, respondents in this study supported this observation – 55% of lobster fishers stated that catches were much lower or lower when compared to catches ten years ago. Surprisingly, 27% of the fishers indicated higher catches while 8% said that they had remained the same over this same period (ANT and DFMR, 2006a).

The lower lobster catches, to an extent, has led to diversification of the fishing industry in Island Harbour: only 33% of fishers stated that they targeted both lobster species. In the mid-1980s, this number would have been closer to 60% or even 70%. This decrease in effort is matched with an increase in fishing activity that targets other species. That is, over 50% of fishers now say that they also target groupers, snappers, and other commercial reef fish species. Lobster fishers in the past usually switched to the finfish fishery only during the

summer months when lobster catches decline by as much as 70% (compared to that during the peak winter season) (Hodge, 1993). Increasingly, however, Island Harbour fishers are also targeting other species (including snappers) during the winter months as well as during the lobster spawning season of February to April. Similar to the lobster fishery, fishers participating in the wider fishing sector acknowledge that catches of snappers, groupers, and other finfish are lower or much lower than ten years ago (ANT and DFMR, 2006a).



The fact that catches have been declining over the years is also one of the reasons why fishers are fishing at increasingly further distances from the traditional fishing location of the inshore reef area. Indeed, all of the fishers participating in this study indicated that they fish outside of the Island Harbour-Shoal Bay area (Harrigan, 2005, pers. comm.; Webster, 2005a, pers. comm.; Webster, 2005b, pers. comm.). The target fish species of these fishers are parrotfish and other reef fishes as well as the spotted spiny lobster (or crayfish). Apart from the more elder fishers who prefer to remain closer to shore, a few younger fishers also use the area for spearfishing.

The popularity of the spotted spiny lobster as the species of choice has as much to do with the market as its location/habitat. That is, unlike the larger spiny

lobsters which are fished in depths between 10 and 60 metres, the spotted spiny lobster is fished in waters generally less than 10 meters in depth (Hodge, 1993). Unfortunately, reef fish are also being impacted by the substantial fishing pressure that is being applied to the spotted spiny lobster because they are being targeted by spearfishers who use these species to bait crayfish traps. Crayfish seem to prefer reef fish over cowhide bait – the preferred bait of the spiny lobster.

In terms of marketing catch, fishers market their catch themselves by selling to middle men or directly to hotels, restaurants, and, to a lesser extent, supermarkets. Lobsters can only be landed live and are sold for US\$10.00 per pound, while fish are iced after being caught and sold for between US\$4.00 and US\$7.00 per pound with the higher price being associated with snappers.

Fishers appreciate their independence and their ability to provide for their families in such a direct way. Indeed, fishing has been a way of life for Island Harbour residents for decades and as long as it remains profitable, it will continue to be one of the preferred livelihoods for members of the community.

The Shoal Bay-Island Harbour Marine Park

Shoal Bay beach is one mile of white sand. Seagrape trees and other coastal plants provide some constancy to an ever-changing shoreline. A gentle slope leads to the expansive, warm, turquoise, clear waters. As one



Farah Mukhida, 2006

▲ Shoal Bay's changing coastline. ►



Farah Mukhida, 2006

of the world's most beautiful beaches, it is arguably the island's most popular. For the most part, however, despite a recent inundation of beach lounge chairs and uniform umbrellas during the tourism high season, there are still plenty of empty patches of sand for suntanners, frisbee throwers, and amateur football players. The unofficial no-noise policy allows visitors to enjoy the sound of the surf or the live reggae music from one of the restaurants.

Coastal Development

Over the last 30 years, both Shoal Bay and Island Harbour have undergone significant changes, but the evolution of Shoal Bay has been particularly pronounced. Prior to the 1970s, Shoal Bay was a vast expanse of sand and water. Seagrass trees lined the beach in abundance and the few locals who did visit the area took refuge from the sun under the thick foliage. As early as the 1940s up to the 1970s, limited sandmining used to support small-scale, local-level construction (Lake, 2006, pers. comm.). Between 1975 and 1979, however, the majority of the trees were cleared to allow for tourism development. Indeed, these years represented a transition period for most of Anguilla towards high market tourism. For Island Harbour, the 1970s were marked with the establishment of the first restaurant in the area – Smitty's Seaside

which opened in 1978 and still opens daily (Smith, 2006, pers. comm.). After the success of Smitty's, a number of other restaurants opened in the area including Uncle Ernie's (1984), Happy Jack's (1984), Trader Vic's (1985), Gorgeous Scilly Cay Restaurant (1985), and the restaurant at the Shoal Bay Beach Hotel (1989). The pace of development increased during the 1990s and early 2000s (Harrigan, 2006, pers. com.). While some of these restaurants are no longer in operation, many were replaced by other new eating establishments or re-opened as part of the resorts.

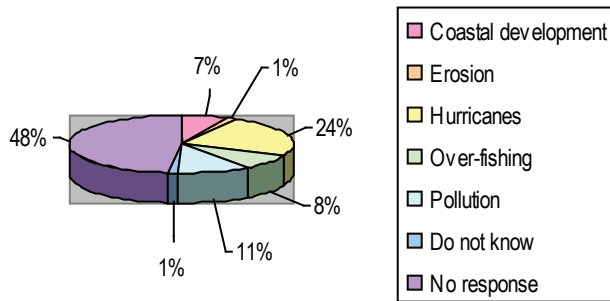
In addition to development in the tourism sector, the communities have also grown residentially and this growth and rate of development in the coastal zone is a concern to both landowners as well as natural resource managers (Billington, 2005, pers. comm.; Cestero, 2005, pers. comm.; Gratton, 2005, pers. comm.; Gumbs, 2005b, pers. comm.; Haskins, 2005, pers. comm.; Hodge, 2005, pers. comm.; Hughes, pers. comm.; Proctor, 2005, pers. comm.). Indeed, stakeholders have expressed concern over the erosion of beaches because of the removal of coastal vegetation, the contamination and nutrient enrichment of coastal waters from grey water runoff and sewage seepage, the lack of a development plan for the area, the degradation of the marine habitat from indiscriminate anchoring and walking



James Gumbs, 2006

on the reef, the removal of marine organisms (including increased fishing pressures), and the lack of public access to beaches (ANT and DFMR, 2006a).

Most significant impacts on Anguilla's marine environment over the next ten years as identified by residents of Shoal Bay and Island Harbour villages



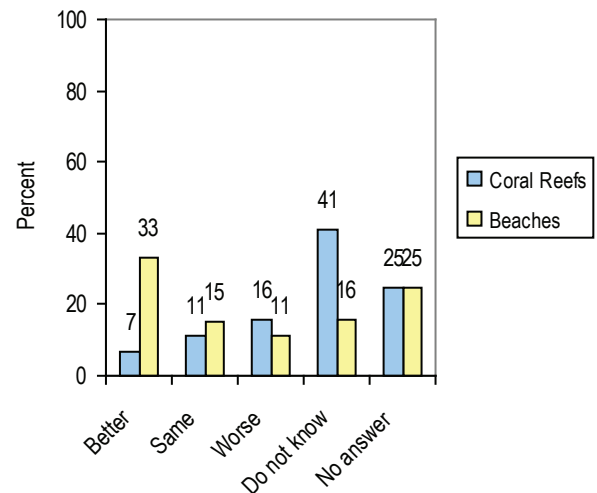
(ANT and DFMR, 2006a)

Damage and degradation to the area because of anthropogenic activities have been compounded by natural disasters and processes. Ground seas have moved sand onto the reefs causing coral suffocation and two strong hurricanes led to the death of much of the hard coral reefs that were once an important component of the nearshore environment. The coral reef systems are still struggling to recover. Algae grow over much of the reef that extends from Shoal Bay to Island Harbour and the corals are affected by both disease and coral bleaching. The system is out of balance and coastal development, for the most part, continues to go unchecked (Proctor, 2005, pers. comm.).

It is interesting to note, however, that despite the apparent decline in ecological health, tourists and many tourist operators and agencies both on the island and abroad continue to consider the Shoal Bay area as one of the top places to visit. Indeed, 84% ± 6.7% of visitors to the beach ranked the quality of the area as high with only 15% ± 6.7% ranking it as fair. No one ranked it as poor. (ANT and DFMR, 2006b).

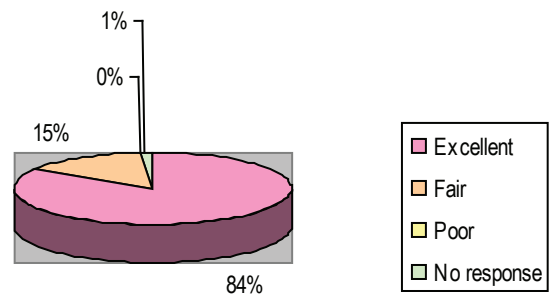
Residents in the area noted concerns with the condition of the island's reef systems and beaches (as well as those of Shoal Bay-Island Harbour Marine Park). Indeed, 45% ± 11.5% of the residents have stated that the coral reefs are in worse condition in 2006 compared to their condition in 1996. 24% ± 11.5% stated that beaches were in worse condition in 2006 compared to ten years ago.

Quality of Anguilla's coral reefs and beaches in 2006 as compared to 1996 as perceived by residents of Shoal Bay and Island Harbour villages

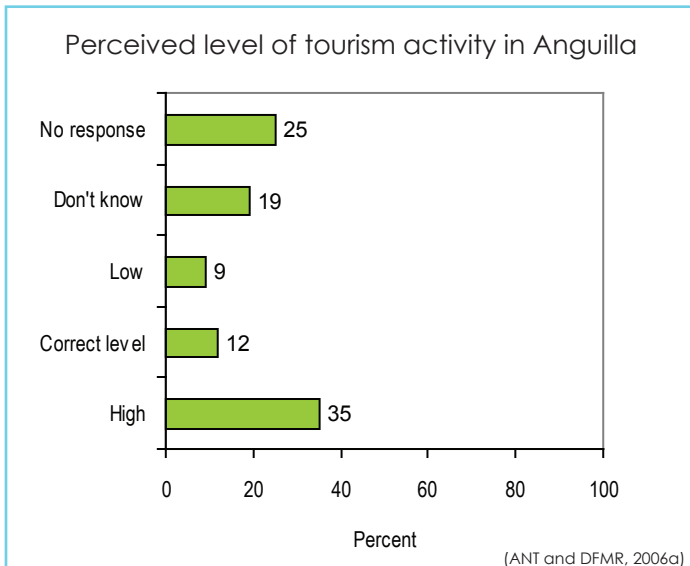


(ANT and DFMR, 2006a)

Quality of the Shoal Bay-Island Harbour Marine Park as perceived by visitors



(ANT and DFMR, 2006b)

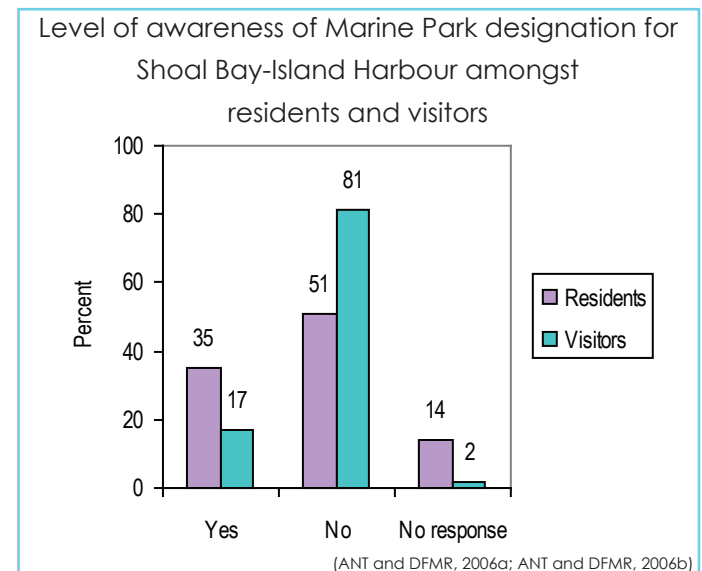


A significant percentage of residents also noted that the level of tourism in 2006 (35% ± 11.5%) was exceedingly high compared to 12% ± 11.5% who believed the level was appropriate and 9% ± 11.5% who considered it low (ANT and DFMR, 2006a).

In addition to impacts on the coastal and marine environments, development (particularly as it relates to tourism) has also had a psychological impact on Anguillians. As has occurred and been observed on other beaches on the island, the number of Anguillians visiting the Shoal Bay beach has declined over the years. The beach, once a popular venue for church-related activities and for family outings, is no longer visited by residents as frequently (Hughes, 2005, pers. comm.). The change has been attributed to the increase in tourists and to the discomfort of Anguillians intermingling in such a personal and close way with them (Gumbs, 2005b, pers. comm.; Harrigan, 2006, pers. comm.; Hughes, 2005, pers. comm.; Webster, 2005b, pers. comm.).

Public Awareness and Involvement in the Establishment of a Marine Park

Although all five of Anguilla's protected areas were established in 1993, the level of awareness amongst the public about the areas, their locations, status, and regulations was low – and has continued to remain low. Hodge (2005, pers. comm.) notes that the public



awareness campaign during the establishment of the park was a “small scale effort” with a limited number of fishermen involved in the process; the general public was not invited to participate. In essence, it was an exercise conducted by government departments with a minimal amount of consultation - let alone participation – by major stakeholder groups (including dive operators, restaurateurs, hoteliers, fishers, and residents).

The need to educate the public is clear, especially considering the current state of management (which has been almost nonexistent) and a concerted effort



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to change this.

Balancing Use and Protection of Coastal Resources and Areas

At the moment, the Shoal Bay-Island Harbour Marine Park is used extensively by tourists and to a lesser extent by residents. Activities occurring (or that should be permitted) within the Park's boundaries include swimming, diving, sunbathing, walking on the beach, beach sports, canoeing, kayaking, windsurfing, paddle boating, glass-bottom boat tours, visiting historical/archaeological sites, and filming. Removal of coral, anchoring without the use of mooring buoys, unregulated vending, dumping of waste, and driving on the beach were not supported and all are prohibited. There was, however, no agreement amongst stakeholders as to whether jetskiing, powerboating, snorkelling, fishing (pot, line, and/or spear), cruising, dining, parasailing, and water skiing should be allowed (ANT and DFMR, 2006a; ANT and DFMR, 2006b).

Resolving the disagreement among proponents of jet and waterskiing and those who believe that the activities should be banned is not as complicated as some of the other issues. The former is prohibited by law in any coastal area of Anguilla and thus cannot and will not be introduced. The contention with powerboating/cruising, parasailing, and snorkelling was primarily a concern with safety and noise which could potentially be addressed within a management plan that allows for the zoning of the park as a multiple use area. The disagreement with dining was related to the type of dining that should be available and the belief that fast food chains should not be allowed to operate in the area. As Anguilla has no typical fast food chains currently in operation, and there are no real plans for any such restaurants to be granted an operating

Box 4

Level of interest in participating in activities as determined by residents of Shoal Bay and Island Harbour villages

Activity	Interested in Participating (% ± 11.5%)	Somewhat Interested in Participating (% ± 11.5%)	Not Interested in Participating (% ± 11.5%)
Beach walking and sunning	81	2	17
Sailing	20	12	68
Power-boating	39	4	57
Swimming	74	0	26
Snorkelling	33	7	60
Scuba diving	20	5	75
Dining/ Entertainment	44	15	41
Viewing historical sites	25	15	60
Fishing	27	5	68

(ANT and DFMR, 2006a)

permit, it is unlikely that any such food outlets will be opened in the near future (ANT and DFMR, 2006b).

Fishing within the park, meanwhile, is currently permitted, but can only be practiced by Anguillians. There was no agreement on whether fishing by speargun, hook and line, and pots should be allowed although it appears as though other gear and/or methods (namely beach seine and trawling) are not used and therefore limit the extent of the conflict (ANT and DFMR, 2006a; ANT and DFMR, 2006b).

Box 5

Activities of interest to residents of Shoal Bay and Island Harbour villages

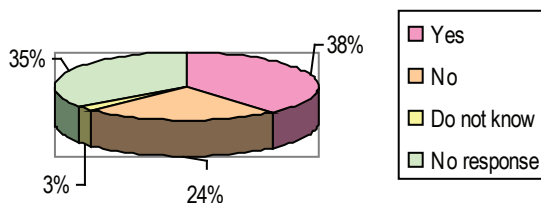
Other Activities of Interest	Level of interest (% ± 11.5%)
Beach sports	7
Jetskiing	3
Water park activities (e.g. water slides)	3
Boat racing	1
Mooring buoys for boats	1
Swimming lessons	1
Surf boarding	1

(ANT and DFMR, 2006a)

As an area – particularly the Island Harbour village – that is highly dependent on fishing in historical, cultural, and economic contexts, banning all forms of fishing within the marine park boundaries may be difficult and zoning the area to accommodate the activity (or forms of it) may be necessary. Nevertheless, it is interesting to note that residents do appear to support a total fishing ban within the Shoal Bay-Island Harbour Marine Park (ANT and DFMR, 2006a).

At the same time, it is essential that any member of the communities that are involved in the activity is not only invited, but encouraged to actively participate in the process of delineating boundaries, identifying

Level of support by residents of Shoal Bay and Island Harbour villages for a complete ban on spearfishing within the Marine Park



(ANT and DFMR, 2006a)

Box 6

Activities that should be prohibited as per residents of Shoal Bay and Island Harbour villages

Other Activities that should be Prohibited	Level of interest (% ± 11.5%)
Jetskiing	9
Dumping of waste	7
Fishing (including spearfishing)	5
Driving on the beach	4
Indiscriminate anchoring	3
Additional coastal development	1
Loud music	1

(ANT and DFMR, 2006a)

zones of use, examining alternative livelihoods, and the management of fisheries through quotas and/or closed seasons.

By design, zoning of the marine park could also address issues related to boating and snorkelling. Similar to fishing, however, no decision should be made without adequately consulting with stakeholders and securing some level of their active involvement. The issue of zoning the Shoal Bay-Island Harbour Marine Park has the support of both government and nongovernment agencies and individuals. Indeed, stakeholder representatives have stated that zonation will not only help with the protection of key areas but also in the promoting of safety and of multiple and sustainable use (Billington, 2005, pers. comm.; Brooks-Hodge, 2005, pers. comm.; Hodge, 2005, pers. comm.; Hughes, 2005, pers. comm.).

Officials responsible for managing natural coastal resources and the activities that are dependent on them all agree that the management process (beginning with the definition of objectives and the uses of the Park) must be open and transparent. While significant resources (financial and human) as well as time and effort may need to be invested, such

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Box 7

Level of interest in participating in activities as per visitors to the Shoal Bay-Island Harbour Marine Park

Activity	Interested in Participating (% ± 6.7%)	Somewhat Interested in Participating (% ± 6.7%)	Not Interested in Participating (% ± 6.7%)	No Response (% ± 6.7%)	Participated in During Visit (% ± 6.7%)
Beach walking and sunning	86	7	3	4	80
Sailing	12	12	52	24	6
Power-boating	8	8	61	23	5
Swimming	86	4	5	5	78
Snorkelling	55	9	19	17	51
Scuba diving	14	9	54	23	14
Dining/ Entertainment	54	19	17	10	60
Viewing historical/ archaeological sites	20	16	43	21	17
Fishing	8	7	58	27	6

(ANT and DFMR, 2006b)

a process will help foster co-operative relationships among stakeholders – particularly between government and nongovernment agencies (Brooks-Hodge, 2005, pers. comm.; Proctor, 2005, pers. comm.). It may also increase the level of voluntary compliance with and self-enforcement of Park regulations.

Currently, the Shoal Bay-Island Harbour Marine Park is managed by the Department of Fisheries and Marine Resources. Unfortunately, due to limited financing and human resources as well as to regulations with limited scope, effective management has not been possible (Hughes, 2005, pers. comm.). Indeed, even the DFMR has acknowledged the limitations of the

management arrangement, stating that the “DFMR has no autonomy in the spending of funds, especially collected revenue from the marine parks” (Gumbs, 2005b, pers. comm.).

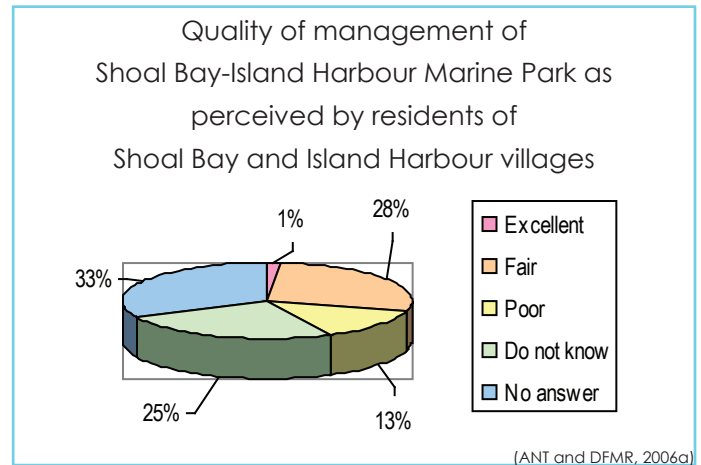


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Although fees collected through cruising permits, mooring buoy usage, and a US\$1.00 tank tax directed at SCUBA divers, funds are not re-directed into the marine park and the effect is noticeable – no signs demarcate the area, enforcement of regulations has been minimal at best, and it is not clear whether the Park is actually fulfilling its mandate or achieving its objectives (Billington, 2005, pers. comm.). In essence, it is a “paper park” (Hodge, 2005, pers. comm.). While the constraints of effective marine park management are numerous (funding, staffing, sound legislation, rising fuel costs, and reliable on-the-water transportation), the opportunities and benefits outweigh the difficulties (Gumbs, 2005b, pers. comm.). In addition to realising current untapped sources of revenue (including but not limited to the consistent collection of mooring buoy fees, a SCUBA diving fee programme, and/or a potential hotel/entertainment tax), Shoal Bay-Island Harbour Marine Park could be an important component of an outdoors environmental education programme for Anguilla’s youth, act as a key research site for studying coral reef health and regeneration, and be an example of a meaningful, comprehensive, and inclusive environmental preservation and biodiversity conservation initiative (Hughes, 2005, pers. comm.).

Since at least 2001, questions surrounding which agency would be in the best position to manage Shoal Bay-Island Harbour Marine Park (and all marine parks, in general) have surfaced. In a workshop facilitated by the Trust for Sustainable Livelihoods in 2005 during which the Department sought to clarify its mandate and responsibilities as a government agency, representatives from across government Ministries and the Anguilla National Trust agreed that with appropriate legislative and financial support, the ANT could be in a strategic position to manage the parks (Homer, 2005).

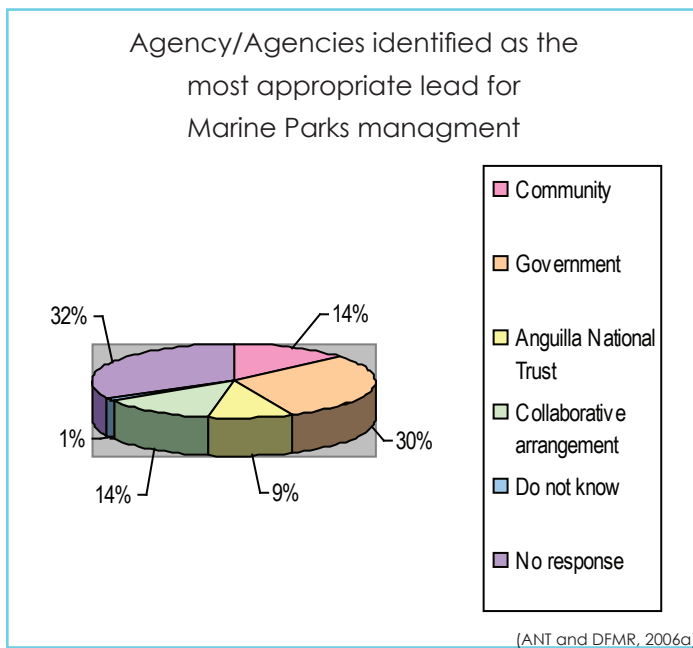
The ANT currently has the remit to manage terrestrial areas (Hughes, 2005, pers. comm.). With the appropriate staff, technical expertise, and financial support of the Government Anguilla (particularly within the first three years of the transfer of responsibility), the Trust, as a statutory body independent of the financial bureaucracy of Government, could take a lead role and implement a self-financing, sustainable marine protected area regime across the island (Brooks-Hodge, 2005, pers. comm.; Gratton, 2005, pers



comm.; Gumbs, 2005b, pers. comm.; Hughes, 2005, pers. comm.). For MPA management to be effective, however, there must still be a coordinated effort among departments, agencies, and individuals that have a stake in the areas.

A significant percentage of residents (30% ± 11.5%) in the two villages maintain that the Government of Anguilla should be the body responsible for managing the Shoal Bay-Island Harbour Marine Park. Others, meanwhile, are under the impression that the community (14% ± 11.5%) should be responsible while 9% ± 11.5% suggest that it should fall under the mandate of the ANT. 14% ± 11.5% state that it should be a co-management arrangement (ANT and DFMR, 2006a). Should management be collaborative, there

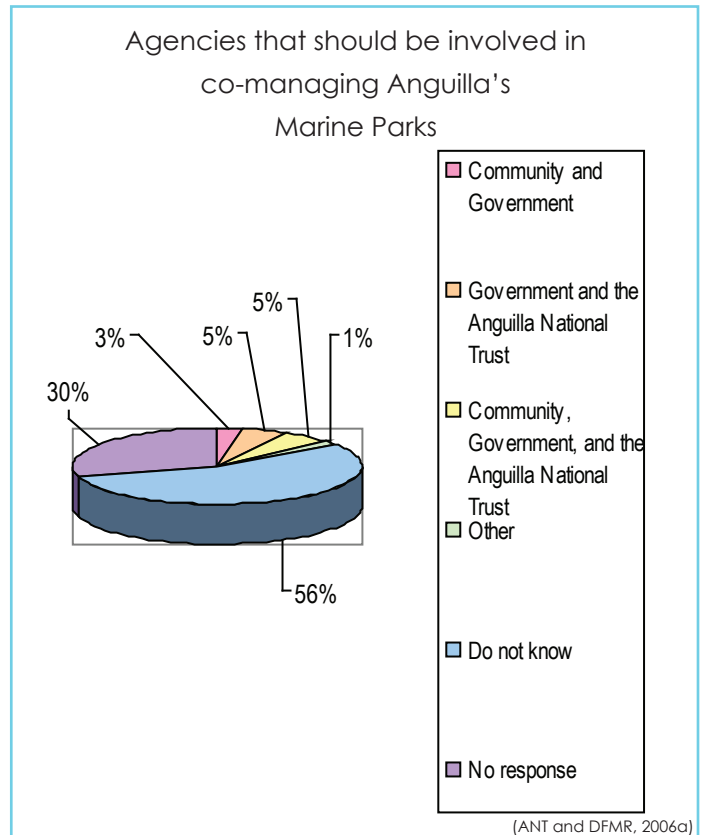
was no real agreement as to who should be involved although government, the Trust, and/or the community – or some combination of these stakeholders – should have a part to play (ANT and DFMR, 2006a).



The excessive level of “no response” among residents with regards to the management of the marine protected area can once again be attributed to a general lack of awareness about the Marine Park. Moreover, it should elucidate the clear need to increase the level of awareness among not only residents of the Shoal Bay and Island Harbour communities, but of residents and visitors across the island. Indeed, success in marine protected area management is rooted in education. Awareness of a how a person’s actions and perceptions affect their social, economic, political, and natural environments will allow for personal development and a real change in behaviour.

The current state of general (and basic) environmental education on the island is poor and this, in turn, is affecting the capacity of the community to be involved in the management of the Shoal Bay-Island

Harbour Marine Park – the public is currently not in the position to have a significant role in managing or directing the management of the area. At the



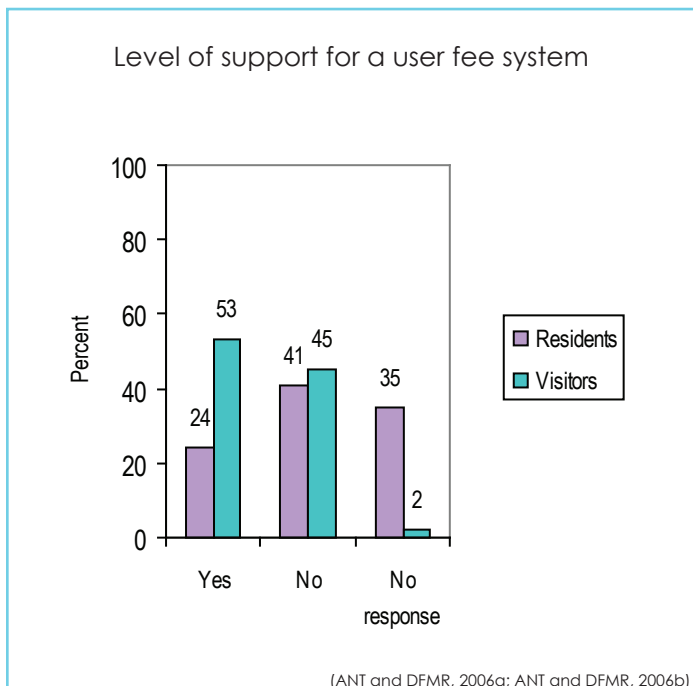
same time, however, this can be easily corrected with a concerted, comprehensive public awareness campaign aimed at reconnecting communities (and stakeholders, in general) with the natural environment that surrounds them.

In terms of creating a system that may not necessarily be lucrative but at least self-supporting, marine parks can generate revenue through user fees. The level of support of such a system is varied – both within visitor’s groups and the local communities. One of the main points of contention was the belief that fees collected would not be reinvested into either the marine park or into coastal/marine conservation. If such a reinvestment could be guaranteed, the level

of visitor support increases. Local residents, meanwhile, remained sceptical of such a programme (Appendix 6) (ANT and DFMR, 2006a; ANT and DFMR, 2006b).

It is interesting to note that according to the results of the socioeconomic assessment of visitors to the

Marine Park, there appears to be a correlation between nationality of the visitor and their willingness to support a user fee programme. That is, visitors from North America were both willing to pay a user fee as applied to certain activities (for example, boating, diving, or entertainment) and pay more for that fee than those visitors from European nations. At the same time, visitors who spend more time on the island were also more likely to be willing to pay than the excursionists (“day trippers”) travelling from St. Martin. The low level of support expressed by the latter group could be attributed to the additional expense of travelling to Anguilla from St. Martin in terms of the cost of the ferry, departure taxes, and hiring of a rental car or taxi for the day. These excursionists also have their St. Martin accommodation and transportation costs to consider. Visitors, meanwhile, who are on holiday in Anguilla, do not have those extra expenses and thus may be willing to pay higher Marine Park fees. Understanding the needs, priorities, and positions of the Marine Park stakeholders is also essential and meetings focussed on boundary delineation, zonation, and user fees should be held. These



Box 8

Level of resident and visitor support (%) for a user fee system for activities conducted within the Shoal Bay-Island Harbour Marine Park

Activity	No Fee		US\$1-US\$2		US\$3-US\$5		US\$6-US\$10		US\$11-US\$20		US\$21-US\$30		>US\$30	
	R	V	R	V	R	V	R	V	R	V	R	V	R	V
Park entrance	90	67	2	5	6	19	0	6	0	1	0	1	2	0
Beach walking & sunning	94	98	2	1	4	<1	0	0	0	0	0	0	0	0
Sailing	77	66	0	3	15	7	4	7	2	7	2	1	0	8
Power-boating	74	62	0	2	4	6	8	6	2	5	8	3	4	15
Swimming	94	96	4	2	2	2	0	<1	0	<1	0	0	0	<1
Snorkelling	88	83	0	5	6	5	4	4	0	<1	0	1	2	1
SCUBA diving	84	66	0	4	2	8	6	6	8	4	0	4	0	7
Dining/ Entertainment	76	79	4	5	4	1	0	2	2	4	8	3	2	5
Viewing historical/ archaeological sites	74	69	6	6	8	13	4	7	0	1	4	1	4	2
Fishing	90	69	0	3	4	6	2	8	0	5	2	2	2	6

(ANT and DFMR, 2006a; ANT and DFMR, 2006b)

meetings must go beyond superficial consultation that does not necessarily address or incorporate the views of the stakeholders. Constructive collaboration is possible as long as the process remains transparent, open, and flexible. Whether management becomes co-management (between government, the ANT, and the community – or some combination thereof) or remains in the ultimate control of government or

the ANT (as a lead agency) as suggested by both government and nongovernment representatives, remains to be determined. Indeed, it will only be adequately resolved through clear communication, open dialogue, and effective legislation that promotes voluntary compliance but that also allows for strict enforcement (Billington, 2005, pers. comm.; Gratton, 2005, pers. comm.).

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Conclusion

Caribbean societies are highly dependent on marine and coastal ecosystems – and particularly on the coral reefs and their associated habitats (mangrove forests and seagrass beds). These ecosystems, despite their fragility, have provided shoreline protection from storms, sand for beaches, food, medicines, construction material, and have acted as the basis of a multi-billion dollar tourism industry. Despite a growing awareness of their vulnerability as well as their importance, coral reef ecosystems continue to be put at risk from over-exploitation, destructive fishing practices, coastal development, siltation, agriculture, deforestation, and pollution. At the same time, efforts are being made to protect these critical environments, including through the establishment of marine protected areas.

Ultimately, it is what we do with the land and the water around it that will make or break this island.

*- Mimi Gratton, Former Director,
Anguilla Hotel and Tourist Association*

Over the years, natural resources and protected area managers have increasingly realised that the most effective marine protected areas are those that take socio-economic factors of surrounding communities and stakeholders into consideration as well as those that use this information in the design, implementation, and enforcement of management plans. These plans (and the process through which they are developed) must find that balance of meeting the needs of stakeholders with the protection of the resources that those same stakeholders are dependent upon.

The socio-economic study of the Shoal Bay – Island Harbour Marine Park was a relatively rapid assessment of the communities that border the site. Information collected should be used to help managers and

policy makers to make informed decisions pertaining to the management of sensitive marine ecosystems.

Marine protected area management requires a two-pronged approach. One aspect of the approach is structural and relates to regulatory policies and programmes. Although such a top-down approach is not always ideal – it aims to affect change through minimal two-way communication, restriction, and coercion – it is sometimes needed when other, less aggressive methods fail to work. Behavioural solutions, however, should also be promoted. Change in individual's behaviour – in ways of thinking, attitudes, and action – is almost always the preferred approach since the effects tend to be more long-lasting and significantly more cost effective. Integrating structural and behavioural solutions to address limitations of MPA management, however, also requires a high level of understanding amongst stakeholders about the resources, the areas, the management system, and their impacts on them. Unfortunately, this environmental awareness is lacking amongst many of the Shoal Bay-Island Harbour Marine Park stakeholders – particularly among the residents of these villages and the users of the Park.

Such limited understanding of the Park has numerous implications. It becomes difficult to gauge the level of community support for a Marine Park when residents do not even realise that it exists. Furthermore, expecting community members to play an active and real role within the management regime is almost impossible because their limited knowledge is reflective of their limited capacity.

Shoal Bay-Island Harbour Marine Park is a heavily-used area. Shoal Bay beach is used by both residents and locals for a multitude of activities including (but not limited to) fishing, swimming, watersports, sunbathing,

and boating. Ensuring that these activities and users do not conflict with each other requires careful planning. Management officials (including those responsible for enforcement) as well as MPA users must also be knowledgeable about the regulations and be sensitive to the needs of the communities and the environment. It requires a form of management that is based on learning and that is flexible and adaptive enough to changing conditions and available information (as collected through a comprehensive monitoring programme). In essence, it requires converting knowledge into action. It also requires constant consideration of the environmental, economic, and political circumstances that the area was established under and is operating within.

While this socioeconomic assessment provided information about the views, perceptions, and situations of the stakeholders of Shoal Bay-Island Harbour Marine Park as well as information which can be applied to the development and implementation of a management plan for the area, it also provides a framework that can be adapted for similar studies for Anguilla's other MPAs. Moreover, lessons can also be learned from this particular experience.

Anguilla experiences significant fluctuations in tourist numbers between the tourism low and high seasons (June to October and November to May, respectively). Along with an actual difference in number, there is also a difference in the type of visitor. The low season tends to be marked with an increase in European visitors who tend to travel on a tighter budget – perhaps due to distance travelled and the expense of flight. High tourist season tends to see an influx of North Americans (and primarily those from the United States). These visitors tend to have shorter distances to travel and perhaps more money to spend. It is essential that any socio-economic assessment captures differences. In addition, with tourists from around the world visiting

the island, a communication barrier arises. The impact of not being able to discuss issues or ask questions will be observed in the form of information gaps within the assessment.

The initiative must also be tailored to the site and its users. Questions asked – whether they are directed at key informants in interviews or stakeholders through questionnaires – must address issues at an appropriate depth and context. In addition to questions asked in the surveys presented to residents of the Shoal Bay and Island Harbour communities and/or to visitors of the marine park, additional information could also be collected regarding: the benefits of coastal environments to the community; problems (human-induced or natural) that may affect the area in question; previous involvement with the creation of the protected area; potential impacts of the MPA on the surrounding areas, livelihoods, and attitude; who is affected by the marine park; the level of the respondent's interest in being involved in MPA management; the role of stakeholders, in general, within the management system; and the role of community organisations within that system.

MPA management cannot occur in a natural science vacuum. Indeed, integral to any successful MPA management initiative is a sound understanding of both the biophysical components of the area and the socio-economic factors influencing and affecting the stakeholders that use that area. Recognising the role that such factors play in determining the site's ecological health and integrity can undoubtedly help natural resources managers to identify sources of environmental degradation and the opportunities to address, mitigate for, and perhaps even overcome them. The natural can no longer be separated from the social. Clearly, the tools to make this connection – including socio-economic assessments – should be integrated, from the beginning, into any MPA management process.



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Appendix 1

Marine Use and Views Survey - Residents

SECTION A: GENERAL DEMOGRAPHICS & INDIVIDUAL ECONOMICS

- A1) What is your **age**? (circle) under 20 / 20-29 / 30-39 / 40-49 / 50-59 / 60+ years
- A2) **Gender**? Male / Female
- A3) What is your **ethnicity**? Caucasian / Hispanic / Black / Asian / East Indian / other (identify)
- A4) Highest level of **education completed**? primary / secondary / college / graduate school / other training (identify)
- A5) **Marital** status? single / cohabitating / divorced or separated / widowed
- A6) How many **children** do you have?
- A7) Where were you **born**?
- A8) How long have you **lived in Anguilla**? All my life / years
- A9) What is your current **housing type**? house / apartment / public housing / other (identify)
- A10) What is your **house made of**? wood / cement brick / other (identify)
- A11) Do you **own or rent**? own / rent
- A12) How many **people live in your household** (including yourself)? # adults / # children (≤18 years old)
- A13) What is (are) your current **income generating activity (activities)** (occupations)? If you are retired, sick, or temporarily unemployed, then please give your occupation(s) when you were working. If your primary occupation is a homemaker, please list that in addition to any income generating activities.
- Activity (from activity that generates most income to least) & # years
- i.
 - ii.
 - iii.
- A14) What is your **contribution to total household income** (percentage)? %

SECTION B: USE OF THE MARINE ENVIRONMENT

B1) When you visit the **beach or go out on the water**, which **activities** do you undertake on your visit(s)?
(check all that apply)

- Beach walking & sunning
- Sailing
- Power-boating
- Swimming
- Snorkelling
- SCUBA diving
- Dining/Entertainment
- Fishing
- Viewing historical/archaeological sites
- Other (identify)

[If activities include fishing, go to SECTION C, if not SKIP SECTION C]

[If activities include SNORKELLING or SCUBA DIVING, go to B2, if not go to B3]

B2) What kind of **marine experience** are you looking for? (viewing of speices of marine life and/or marine environment)? (list)

B3) Did you know that **Shoal Bay-Island Harbour** is a MARINE PARK? yes / no

B4) How often do you **visit Shoal Bay-Island Harbour Marine Park**? Never / # times/year

[If interviewee visits the Park, go to SECTION D, if *never* visits Marine Park, SKIP SECTION D]

SECTION C: FISHING

C1) Please describe your typical fishing trip - use more paper if necessary

Target species & Gear (What are you fishing for? What gear are you using?)	Frequency of effort (# of times per week or season, how often do you go fishing, & when?)	Location & Habitat (Describe where you go - use a map if necessary - is it a reef, seagrass, deep sea, etc.)	Estimated catch (Amount - # of fish & weight [lbs] or average size)	Type of operation (Commercial, subsistence, recreational - what do you do with your catch?)
Species 1				
Species 2				
Species 3				

C2) For each of the species listed in C1, how is their availability (abundance or ease of catch) compared to ten years ago?

Species 1: much higher / higher / same / lower / much lower / don't know

Species 2: much higher / higher / same / lower / much lower / don't know

Species 3: much higher / higher / same / lower / much lower / don't know

C3) Do you own or have **access to a boat** that you regularly fish from? yes / no

C3a) Do you own the vessel or are you crew? own / rent / borrow / crew

C3b) What type of vessel? power / sail / other (identify)

C3c) Hull material? fiberglass / wood / other (identify)

C3d) What is the vessel length? ft

C3e) How many persons usually go out on this vessel? #

[Repeat the above for multiple vessels, mark to the side]

C4) Are there any **specific months** when there is **increased targeted fishing activity**, where, and why (e.g. grouper spawning or other fish aggregations, lobster crawl, turtles mating season, etc.)

Species	Months (Start - End)	Where (Location & habitat)	Why
1.			
2.			
3.			

SECTION D: SHOAL BAY-ISLAND HARBOUR MARINE PARK

D1) What **attributes are important** to you in choosing **Shoal Bay-Island Harbour Marine Park** over another local destination?

Rate from	Most important.....Least Important				
Accessibility	1	2	3	4	5
Quality of beaches	1	2	3	4	5
Quality of fishing	1	2	3	4	5
Restaurants/ entertainment	1	2	3	4	5
Clear water	1	2	3	4	5
Other (identify)	1	2	3	4	5

D2) When you visit Shoal Bay-Island Harbour Marine Park, what activities are you interested in participating in?

Rate from	Most interested				
Beach walking & sunning	1	2	3	4	5
Sailing	1	2	3	4	5
Power-boating	1	2	3	4	5
Swimming	1	2	3	4	5
Snorkelling	1	2	3	4	5
SCUBA diving	1	2	3	4	5
Dining/ entertainment	1	2	3	4	5
Viewing historical/ archaeological sites	1	2	3	4	5
Fishing	1	2	3	4	5
Other (identify)	1	2	3	4	5

D3) Are there any other activities that you would like to participate in that are not currently available? (identify)

D4) Should any activities NOT be allowed in the Park? (identify)

D5) Do you support the implementation of a USER FEE in order to participate in the activities listed previously (Question D2) in the Park if you knew that the money from this fee would go towards the management of the Park? yes / no

[If yes, go to D6, if no, skip to D7]

D6) If YES, which of these activities should have an associated fee & how much would you be willing to pay? (check appropriate)

	No fee	\$1-\$2	\$3-\$5	\$6-\$10	\$11-\$20	\$21-\$30	over \$30
Park entrance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beach walking & sunning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sailing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power-boating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Swimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snorkelling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SCUBA diving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dining/entertainment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Viewing historical/ archaeological sites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

D6a) If NO, why not?

D7) Do you support the ban of fishing inside the park boundaries? yes / no

D7a) If NO, why not?

D8) What is your overall impression of Shoal Bay-Island Harbour Marine Park? (circle one)
 excellent / pretty good / fair / just okay / poor

SECTION E: PERCEPTION OF THE MARINE ENVIRONMENT & POLICY

E1) What is the **current level of fishing activity** throughout **Anguilla**? (circle one)
 high / correct level / low / none / don't know

E2) What is the **current level/quantity of tourism activity** throughout **Anguilla**? (circle one)
 high / correct level / low / none / don't know

E3) What is the **current condition** of **Anguilla's coral reefs** compared to ten years ago? (circle one)
 much better / better / same / worse / much worse / don't know

- E4) What is the **current condition** of **Anguilla's beaches** compared to ten years ago? (circle one)
much better / better / same / worse / much worse / don't know
- E5) In ten years, what do you feel will be the **top negative impact to Anguilla's marine environment**?
over-fishing / pollution / coastal development / hurricane or storms / other (identify)
- E6) What is your over-all impression of the **management of Anguilla's Marine Parks**? (circle one)
excellent / pretty good / fair / just okay / poor / don't know
- E7) Do you support a **ban of spearfishing inside Anguilla's Marine Parks**? yes / no
[If yes, go to E8, if no, SKIP to E7b]
- E7b) If NO, why not?
- E8) What is overall impression of the **enforcement of Fishing Regulations in Anguilla**? (circle one)
excellent / pretty good / fair / just okay / poor / don't know
- E9) Who should be responsible for the **management of Shoal Bay-Island Harbour Marine Park**? (circle one)
the community / government / Anguilla National Trust / a collaborative arrangement /
don't know / other (identify)
- E9a) If YES for a collaborative arrangement, between which organisations/institutions? (circle all that
apply)
the community / government / Anguilla National Trust / other (identify)

- E10) How important are these **sources of information** to your knowledge/understanding of the following:
- i. the **marine environment**: types and locations of different species; fish behaviour; tides; etc.
 - ii. **marine management**: fishing rules and regulations; marine park location and regulations; etc.
- (Rate importance - VI (very important), SI (somewhat important); NVI (not very important))

	Marine Environment	Marine Management
Local knowledge/Word of mouth	VI / SI / NVI	VI / SI / NVI
Personal experience	VI / SI / NVI	VI / SI / NVI
Government official	VI / SI / NVI	VI / SI / NVI
Formal education	VI / SI / NVI	VI / SI / NVI
Television	VI / SI / NVI	VI / SI / NVI
Radio (incl. VHF)	VI / SI / NVI	VI / SI / NVI
Newspaper/Magazine	VI / SI / NVI	VI / SI / NVI
Internet	VI / SI / NVI	VI / SI / NVI
Other (identify)	VI / SI / NVI	VI / SI / NVI

- E11) Do you have any additional comments?

Appendix 2

Marine Use and Views Survey - Visitors

- 1) Is this your first visit to Anguilla? yes / no
- 2) How many **persons** are in your group? #
- 3) What is the **purpose of your trip**? pleasure / business / other (identify)
- 4) What **attributes** are important to you in choosing **Anguilla** over another destination?
(Please rate from 1 to 5, 1 being the most important, 5 being the least important)
- | Rate from | Most important.....Least important | | | | |
|-------------------------------------|------------------------------------|---|---|---|---|
| Cost | 1 | 2 | 3 | 4 | 5 |
| Quality of the beaches | 1 | 2 | 3 | 4 | 5 |
| Quality of fishing | 1 | 2 | 3 | 4 | 5 |
| Quality of SCUBA diving/snorkelling | 1 | 2 | 3 | 4 | 5 |
| Clear water | 1 | 2 | 3 | 4 | 5 |
| Other (identify) | 1 | 2 | 3 | 4 | 5 |
- 5) Where are you from (**country**)?
- 6) What is your intended **length of stay** (days)? #
- 7) What was your **method of travel** to Anguilla? airplane / sailboat / ferry / power-boat / other
- 8) Did you know that **Shoal Bay-Island Harbour** is a MARINE PARK? yes / no
[If yes, fo to 8a, if no, SKIP to 9)
- 8a) Where di you **find out** about Shoal Bay-Island Harbour Marine Park? (identify)
- 9) How often do you **visit** Shoal Bay-Island Harbour Marine Park? 1st visit / #times/year

10) What **attributes** are important to you in choosing **Shoal Bay-Island Harbour Marien Park** over another local destination?

Rate from	Most important.....Least important				
Accessibility	1	2	3	4	5
Quality of beaches	1	2	3	4	5
Quality of fishing	1	2	3	4	5
Quality of marine life viewing	1	2	3	4	5
Restaurants/ Entertainment	1	2	3	4	5
Clear water	1	2	3	4	5
Other (identify)	1	2	3	4	5

11) During your visit to **Shoal Bay-Island Harbour Marine Park**, what **activities** are you interested in participating in and which ones will you do on this visit?

Rate from	Most interested.....Least interested					Undertake?
Beach walking & sunning	1	2	3	4	5	yes / no
Sailing	1	2	3	4	5	yes / no
Power-boating	1	2	3	4	5	yes / no
Swimming	1	2	3	4	5	yes / no
Snorkelling	1	2	3	4	5	yes / no
SCUBA diving	1	2	3	4	5	yes / no
Dining/Entertainment	1	2	3	4	5	yes / no
Viewing historical/ archaeological sites	1	2	3	4	5	yes / no
Fishing	1	2	3	4	5	yes / no
Other (identify)	1	2	3	4	5	yes / no

11a) If YES for SNORKELLING or SCUBA DIVING, what kind of marine experience are you looking for? (viewing particular species of marine life and/or marine environment) (identify)

11b) Have you been or do you intend to SNORKEL or SCUBA DIVE in any other locations around Anguilla? yes / no

If YES, WHERE and which activity?

Location	Activity
1.	snorkelling / SCUBA diving
2	snorkelling / SCUBA diving
3.	snorkelling / SCUBA diving

Appendix 2

- 12) Are there any other activities that you would like to participate in that are not currently available in the Park? (identify)
- 13) Should any activities NOT be allowed in the Park?
- 14) What are your **typical per day expenses** for this visit to **Anguilla** (total expenses, including hotel, restaurants, entertainment, etc.) (note currency)? \$
- 15) Do you support the implementation of a USER FEE in order to participate in the activities listed previously (Question 11) in the Park if you knew that the money from this fee would go towards the management of the Park? yes / no

[If yes, go to 15b, if no SKIP to 15c]

15b) If YES, which of these activities should have an associated fee & how much would you be willing to pay? (Please note: this fee is separate from any gear or rental fee)

	No fee	\$1-\$2	\$3-\$5	\$6-\$10	\$11-\$20	\$21-\$30	over \$30
Park entrance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beach walking & sunning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sailing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power-boating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Swimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Snorkelling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SCUBA diving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dining/entertainment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Viewing historical/ archaeological sites	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15c) If NO, why not?

- 16) What is your overall impression of Shoal Bay-Island Harbour Marine Park?
excellent / pretty good / fair / just okay / poor
- 17) Do you have any additional comments?

Appendix 3

Guidelines for Key Informant Interviews

Questions for all stakeholders

1. Purpose of interview
2. Information about the informant
 - a. Age
 - b. Where do you live?
 - c. How long have you been living there?
 - d. Position within the community (employment and number of years)
 - e. Level of education (optional)
3. Shoal Bay/Island Harbour Marine Park
 - a. Marine Park awareness
 - i. Aware that area is a marine park?
 - ii. Aware of when it was established?
 - iii. Aware of why it was established?
 - iv. Aware of marine park regulations and any associated fees?
 - b. Activities
 - i. What activities currently take place within the marine park? (eg swimming, snorkelling, diving, fishing (types of fishing), reef tours, jet skiing, sailing/boating, other water sports)
 - ii. Do any of these activities have associated user fees?
 - iii. Are there any activities that should not occur within marine park boundaries?
 - iv. Are there any activities that currently do not take place within the marine park, but should?
 - v. Are there any activities that occurred in the park in the past but not any more? / Has there been a change in how the area has been used over the years?
 - vi. Should activities be allowed in only certain parts of the marine park (ie should the marine park be zoned)?
 - vii. Which activities should have associated user fees?
 - viii. Should spearfishing be allowed within the marine park?
 - Impact of spearfishing on fish stocks?
 - ix. Should the moratorium on sea turtle harvesting continue?
 - Are you interested in helping to collect information and/or in helping monitor beaches during sea turtle nesting season?

3. Shoal Bay/Island Harbour Marine Park (cont'd)
 - c. Management
 - i. Were you consulted regarding the creation of the marine park?
 - ii. Aware of who currently manages the area?
 - iii. Who should manage the area?
 - iv. Role of informant/associated stakeholder group within the management system/process (along the co-management scale – ranging from instructive to informative.
 - d. Environmental awareness
 - i. Has the area changed over the years?

Anguilla Tourist Board and Anguilla Hotel and Tourism Association

1. Is the marine park part of a marketing strategy for Anguilla?
 - a. If so, how is it advertised/promoted?
2. Do tourists ask about the marine park?
 - a. If so, what information do you provide?
3. Impact of tourism on coastal resources?
 - a. Impact of tourism on the marine park?
4. Role of nature-based tourism?
5. What are the opportunities and constraints of managing the marine park
6. How would you describe the current state of the coastal environment/resources?
7. What is the level of public awareness concerning the marine park?
 - a. If it is poor or minimal, how can it be improved?
8. Plans for future coastal development?

Department of Fisheries and Marine Resources

1. Does/Can the DFMR have a role within marine park management?
2. What are the opportunities and constraints of managing the marine park?
3. How would you describe the current state of the coastal environment/resources?
4. What is the level of public awareness concerning the marine park?
 - a. If it is poor or minimal, how can it be improved?
5. Plans for future coastal development?
6. Impact of tourism on coastal resources?
 - a. Impact of tourism on the marine park
7. Role of nature-based tourism

Dive Operator

1. Can you give us an idea of the number of divers/visitors to your dive shop each year, the numbers diving/ snorkelling within SB/IH park itself, and any change in use patterns?
2. High season, low season for divers?
3. Where divers originate from?

Department of Environment and Department of Physical Planning

1. Does/Can the DoE have a role within marine park management?
2. What are the opportunities and constraints of managing the marine park?
3. How would you describe the current state of the coastal environment/resources?
4. What is the level of public awareness concerning the marine park?
 - a. If it is poor or minimal, how can it be improved?
5. Plans for future coastal development?
6. Impact of tourism on coastal resources?
 - a. Impact of tourism on the marine park
7. Role of nature-based tourism

Restauranteurs and Hoteliers

1. What are your occupancy rates?
 - a. High season
 - b. Low season
2. Number of meals?
 - a. High season
 - b. Low season
3. Do you advertise the marine park to visitors?
 - a. If so, what information do you provide?
 - b. Do visitors ask about the marine park?

Appendix 4

Fishing Effort for the top three Target Species

Gear	Frequency (times/week)	Location	Habitat	Estimated Catch (lbs)	Type of Operation	Abundance of Target Species (compared to 10 years ago)	Months of Fishing Operation	Reasons for Choosing Fishing Location and/or Period
<i>Lobster</i>								
Fish Pot	7	<ul style="list-style-type: none"> ▪ Cliffs and shoreline of Anguilla 	Reef	n/r	Commercial	Same	n/r	n/r
Fish Pot	4	<ul style="list-style-type: none"> ▪ North of Anguilla 	Reef	151 - 250	Commercial	Lower	n/r	Season
Fish Pot	2	<ul style="list-style-type: none"> ▪ North of Anguilla ▪ West of Anguilla 	n/r	101 - 150	Commercial	Lower	November - April	n/r
Fish Pot	2	<ul style="list-style-type: none"> ▪ North of Scrub Island 	n/r	76 - 100	Commercial	Same	December - February	Sea conditions
Fish Pot	1	<ul style="list-style-type: none"> ▪ Cliffs and shoreline of Anguilla 	Reef	n/r	Commercial	Lower	November - February	n/r
Fish Pot	1	<ul style="list-style-type: none"> ▪ Cliffs and shoreline of Anguilla 	Reef	n/r	Commercial	Much lower	n/r	n/r
Fish Pot	n/r	<ul style="list-style-type: none"> ▪ North of Anguilla 	Deep sea	n/r	Commercial & Subsistence	Much lower	November - March	Traditional fishing area
Fish Pot	n/r	<ul style="list-style-type: none"> ▪ No one area 	n/r	n/r	n/r	n/r	September - May	Season
n/r	3	<ul style="list-style-type: none"> ▪ North of Anguilla ▪ Northeast of Anguilla 	n/r	76 - 100	Commercial	Higher	January - May	n/r
n/r	2	<ul style="list-style-type: none"> ▪ North of Anguilla 	n/r	76 - 100	Commercial	Higher	November - February	Sea conditions
n/r	2	<ul style="list-style-type: none"> ▪ North of Scrub Island ▪ East of Scrub Island ▪ West of Scrub Island 	n/r	151 - 250	Commercial	Much higher	January - February	Sea conditions
n/r	n/r	<ul style="list-style-type: none"> ▪ n/r 	Deep sea	251 - 500	Commercial	Lower	November - February	n/r

* n/r = no response

Gear	Frequency (times/week)	Location	Habitat	Estimated Catch (lbs)	Type of Operation	Abundance of Target Species (compared to 10 years ago)	Months of Fishing Operation	Reasons for Choosing Fishing Location and/or Period
<i>Grouper</i>								
Pots	2	▪ Scrub Island	Deep sea	41 - 50	Commercial	Much lower	n/r	n/r
Pots	2	▪ Scrub Island	Deep sea	101 - 150	Commercial	Much lower	April - November	Season
Line	1	▪ North of Anguilla	n/r	11 - 20	Subsistence	Lower	November - February	Water temperature
Line	1	▪ Scrub Island ▪ Captain's Bay	n/r	11 - 20	Subsistence	Same	n/r	n/r
Line & Spear-gun	2	▪ Scrub Island ▪ Seal Island	Reef	31 - 40	Commercial & Subsistence	Much lower	n/r	n/r
n/r	4	▪ Scrub Island	n/r	151 - 250	Commercial	Much lower	February	Spawning
n/r	3	▪ Scrub Island	n/r	n/r	Commercial	n/r	n/r	n/r
n/t	2	▪ North of Shoal Bay	n/r	151 - 250	Commercial	Much lower	February	Spawning

Gear	Frequency (times/week)	Location	Habitat	Estimated Catch (lbs)	Type of Operation	Abundance of Target Species (compared to 10 years ago)	Months of Fishing Operation	Reasons for Choosing Fishing Location and/or Period
Snapper								
Line	1	▪ Scrub Island	Deep sea	11 - 20	Subsistence	Same	n/r	n/r
n/r	4	▪ Scrub Island	n/r	76 - 100	Commercial	Much lower	March	Spawning
n/r	4	▪ Scrub Island	n/r	151 - 250	Commercial	Lower	March - April	Spawning
n/r	2	▪ North of Anguilla ▪ East of Scrub Island	n/r	251 - 500	Commercial	Lower	n/r	Spawning
n/r	n/r	▪ n/r	Deep sea	251 - 500	Commercial	Much higher	n/r	n/r