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Socioeconomic impacts of the Port Honduras Marine Reserve on the coastal communities of southern Belize, Central America (1999-2004)

by

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An Internship Report

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ABSTRACT

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Socioeconomic impacts of the Port Honduras Marine Reserve on the coastal communities of southern Belize, Central America (1999-2004). June 2004.

Abstract of a master's internship thesis at the University of Miami, Rosenstiel School of Marine & Atmospheric Science. Thesis supervised by Dr. Liana Talaue-McManus and Dr. Will Heyman.

The Port Honduras Marine Reserve (PHMR), located in southern Belize, was established in 2000 in order to protect the physical and biological resources of Port Honduras through monitoring, surveillance and patrolling, to preserve the value of the area for fisheries and genetic resources, to provide educational programs and opportunities to the surrounding coastal communities and to develop recreational and tourism services that are sustainable, and an alternative to destructive fishing and hunting methods. Co-managed by the Toledo Institute for Development and Environment (TIDE) and the Belize Department of Fisheries (DoF), the PHMR also has to negotiate the direct pressures of three communities, Punta Gorda, Monkey River and Punta Negra that live off the coastal and marine resources, the impact of a growing tourism industry and the very real threat of illegal fishing. A root problem in the Toledo District is poverty, and without definitive policy and forthcoming action on behalf of Government, and the area NGOs and the communities themselves to move the people out of their current situation and into a more positive, productive and sustainable situation, conservation priorities will be lost in the current struggle. Between Nov. 2003 and April 2004, 108 households, commercial and sport fishing guides were surveyed and approximately 20 people from major stakeholder groups were interviewed to determine current socioeconomic conditions and changes in the communities, and the commercial and sport fish guiding industries today, compared to five years ago when the PHMR was declared. Management effectiveness was also evaluated in order to provide data and recommendations to the managers of the PHMR in the event that the management plan is updated in the near future.

ACKNOWLEGMENTS

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INTERNSHIP DESCRIPTION

This internship was coordinated by the author, Emily V. Collins, candidate for Masters of Arts in Marine Affairs & Policy; Dr. Liana Talaue-McManus, Associate Professor at the Rosenstiel School of Marine & Atmospheric Science (RSMAS) at the University of Miami; Dr. Will Heyman, Senior Scientist, The Nature Conservancy (TNC), Punta Gorda, Belize; Caroline Goldman, Program Manager, Belize Country Program, TNC, Washington, D.C.; and Erika Diamond, Development Director & Ecotourism Coordinator, TIDE, Belize. The goal of this internship was to work with international and local conservation NGOs in southern Belize and document the effects and impacts the Port Honduras Marine Reserve (PHMR) has had on the local communities, particularly households, commercial and sport fishing guides through surveys and interviews.

This study was developed and organized by using two major resources as guidelines. The first resource was a selection of socioeconomic and governance indicators from the IUCN/WCPA/NOAA Working Draft Guidebook, *How is Your MPA Doing? Guidebook for Evaluation Effectiveness of Marine Protected Areas* (Pomeroy et al., 2002). These indicators, used to develop the majority of the survey and interview form questions, were initially selected by TIDE (a co-manager of the PHMR), for the Port Honduras Adaptive Management Project, and further developed by the author of this paper. The second resource was a 1996 publication from the Belize Center for Environmental Studies (BCES), *An Analysis of Commercial and Sport Fishing in the Proposed Port Honduras Marine Reserve* by Will Heyman and Terrance Hyatt. The data from this document was used as a baseline for this study and provided very useful

preliminary information with regards to fishers and fishing practices in southern Belize. Guidelines and information from the October 2003 publication, *Socioeconomic Monitoring Guidelines for Coastal Managers in the Caribbean: SOCMON Caribbean* (Bunce et al., 2003) was also used for this study.

The author of this paper relocated to Punta Gorda in southern Belize on Nov. 1, 2003 and was granted office space first at TIDE, then at TNC. The survey and interview instruments were developed over a period of about two and a half months, from Nov. to Dec. 2003. The surveys were conducted between Jan. 7 and March 30, 2004. Interviews with members from local stakeholder groups and co-managers of the PHMR were conducted between March 11th and March 30th, 2004. The author returned to the United States on April 8, 2004 where all data was entered and evaluated.

TABLE OF CONTENTS

LIST OF FIGURES & TABLES

Tables

1.0 INTRODUCTION

The purpose of this study is to look at the socioeconomic impacts and interrelations of the Port Honduras Marine Reserve (PHMR) on the coastal communities of Punta Gorda, Monkey River and Punta Negra in southern Belize. Two rapid ecological assessments in the early 1990's concluded that healthy levels of nutrient runoff and turbid water flows from the five major rivers that empty into Port Honduras, combined with mangrove islands, seagrass beds, and substrate and reef environments, provide a rich habitat for commercial and recreationally important species in Port Honduras (TIDE PHMR Annual Report, 2003). This and other biological monitoring data has been collected in the area through the years since the early 1990s by the now-defunct Belize Center for Environmental Studies (BCES), with help from local communities and the Belize office of The Nature Conservancy (TNC).

Data and information on commercial and sport fishing guides collected by Will Heyman and Terrence Hyatt and published in *An Analysis of Commercial and Sport Fishing in the Proposed Port Honduras Marine Reserve* in 1996, is existing information that this study used as a baseline in order to report on what the social and economic conditions are today for head of households and fishers (both commercial and sport fishing guides) living off the PHMR. In 2000, *The Voice of the Fishermen of Southern Belize* was published as a culmination of the 1996 study, however no formal socioeconomic information has been collected since in order to monitor and record the circumstances since the PHMR was declared.

Social, economic and governance indicators from the *IUCN/WWF/NOAA "How is your MPA Doing?" Working Draft Guidebook* (Pomeroy et al., 2002) were developed into survey and interview instruments in order to attempt to measure the current climate compared to the previous situation in the same area five years ago. This format is expected to provide a

benchmark for future social, economic and management effectiveness assessments of the PHMR. The Toledo Institute for Development and the Environment (TIDE), a Belizean non-governmental organization (NGO) that grew out of BCES, and co-managers of the PHMR, selected indicators as part of the Port Honduras Adaptive Management Project, a complete management effectiveness study being conducted on the PHMR over the next few years.

With some input and guidance from the *Socioeconomic Monitoring Guidelines for Coastal Managers in the Caribbean: SOCMON Caribbean* (Bunce et al., 2003), indicators that were selected for use to measure the social and economic parameters included: for head of household (non-fishers): demographics, daily life and occupation, living and accommodations, availability and cost of seafood, level of distribution and level of understanding of PHMR information, and PHMR environment and management; and for commercial fishers and sport fishing guides: demographics, vessel and gear information, fishing and effort, catch to market, cost of seafood and income, training, bookings and income, species, location and availability, and PHMR environment and management.

In addition to the qualitative measure that were used as part of the structured surveying process, perceptions and opinions were also taken into consideration through stakeholder consultations and interviews throughout the three communities. It is hoped that the data and information gathered here can not only provide a more comprehensive baseline in order to conduct periodic socioeconomic monitoring on the recurrent impacts of the PHMR, but also answer some questions with regards to how the PHMR is affecting the communities of Punta Gorda, Monkey River and Punta Negra, how TIDE, the day-to-day manager and primary advisor of activities in the PHMR, is fulfilling its management goals and objectives and what the major drivers and pressures are when considering the success and future of the PHMR.

Part of the 2,000 square mile Gulf of Honduras, Port Honduras is a large bay tucked in close to the lower coastline of the Toledo District of Belize (Maheia, personal communication, 2004). Also bordering Guatemala and Honduras, there are approximately 130 low-lying cayes and mangrove islands in Port Honduras (Eltringham, 2001). A Memo of Understanding (M.O.U.) signed in January 2000 by the Government of Belize declared the 160 square-mile Port Honduras Marine Reserve (PHMR) to be co-managed by the Belize Department of Fisheries (DoF) and TIDE (TIDE PHMR Annual Report, 2003).

Three rural and developing communities live on the coastline of the PHMR: Punta Gorda Town, Monkey River Town and Punta Negra Village. Many commercial fishers from these communities who once used destructive fishing practices (such as gill nets) have recently been trained as ecotourism guides, sport fishing guides and dive guides who cater to the growing tourist industry. Some fishers have also been hired (by TIDE) as rangers to patrol protected areas and provide environmental education to the local communities. Two very valuable commercial species, the Caribbean spiny lobster (*Panulirus argus*) and the Queen Conch (*Strombus gigas*) are extracted from parts of the PHMR, and the complex situation that still unfolds today is how to find the delicate balance and benefit of conservation, commercial harvest, subsistence fishing, recreational fulfillment and economic return.

Marine reserves are an important tool with regards to protecting biodiversity. Progress in protecting fragile and important marine areas has been threatened by a lack of ecological and socioeconomic understanding of the resource and surrounding (coastal) areas (Agardy et al., 2003). While the PHMR is indeed a coastal marine reserve contending with the pressures of coastal communities living and fishing within the reserve, and increased tourism and illegal fishing pressures, one of the most difficult demands on the PHMR is dealing with the impact of

poverty throughout the Toledo District. The role of alternative and sustainable activity development has been taken into consideration by TIDE in order to improve the effectiveness of the PHMR by protecting the marine resources *and* ultimately enhancing the local economic value of the area. While the goal of marine reserves and protected areas should be to protect and maintain marine biodiversity, they should at the same time strive to manage the area as effectively as possible by including a way to relieve the initial pressures imposed on the resource in the first place. Once this can be achieved there will hopefully be an incentive on behalf of the coastal communities to balance conservation and use (Bovarnick et al., 2003).

Along with poverty, illegal fishing and tourism are the other two major external pressures currently affecting the people and the natural environment of southern Belize. TIDE is attempting to control, manage and limit these drivers, while preserving the regions' environmental elements, conserving its most valuable and profitable resources, and providing economic and sustainable development and benefits to the surrounding communities. This study is looking at how the PHMR is relating to the coastal communities to determine what the major socioeconomic changes and impacts have been on the coastal communities living in the PHMR since it was declared in 2000. Looking at whether or not the coastal communities of the PHMR are better or worse off as a result of any changes in the last five years will also help to determine if TIDE has been successful and effective in managing and developing the PHMR so that its resources are protected and properly managed, and its stakeholders are concerned and involved in its future.

Recognizing what is the perspective of these coastal communities is fundamental to realizing why certain attitudes and perceptions exist, and how social and economic growth, progress and development in the Toledo District can be achieved. While marine protected areas

and marine reserves have multiple definitions, these coastal communities also have multiple uses (Agardy et al., 2003). The balance of traditional and sustainable use of a marine resource, usually an important objective with regards to marine reserve management, often neglects to incorporate ways in which the coastal communities can support and contribute to the management and development of protected areas. Although further study would be recommended, the information and data gathered in this study will hopefully contribute and be useful to both government and non government sectors so they can continue to negotiate successfully with policy makers and neighboring countries for sustainable economic and environmental development in the Mesoamerican region.

2.0 METHODOLOGY

2.1 Study Area

Belize is a small and sparsely populated country in Central America bordered by Mexico to the North, the Caribbean Sea to the East, and Guatemala to the South and West. (Figure 1a) With a population of approximately 266,440 people (2004 est.), inhabiting an area of only 22,960 square km, Belize is known for having one of the lowest population densities in the world (CIA World Factbook, 2003). (Figure 1b) Forty one percent of the land in Belize is under protected status (Eltringham, 2001). Formerly known as British Honduras, Belize only gained its independence in 1981 (CIA World Factbook, 2003). It is a very young and proud nation that relies heavily on tourism, the country's single largest employer and contributor to economic growth, due to 93% of its land falling under forest cover, its proximity to the second largest barrier reef in the world, claim to the largest cave system in Central America, hundreds of species of birds, thousands of Mayan temples and structures and the only jaguar reserve in the world (http://www.belizetourism.org/invest.html and http://www.pactbelize.org/pact.html). (Figure 1c)

Figure 1a: Map of Central America

Figure 1b: Map of Belize

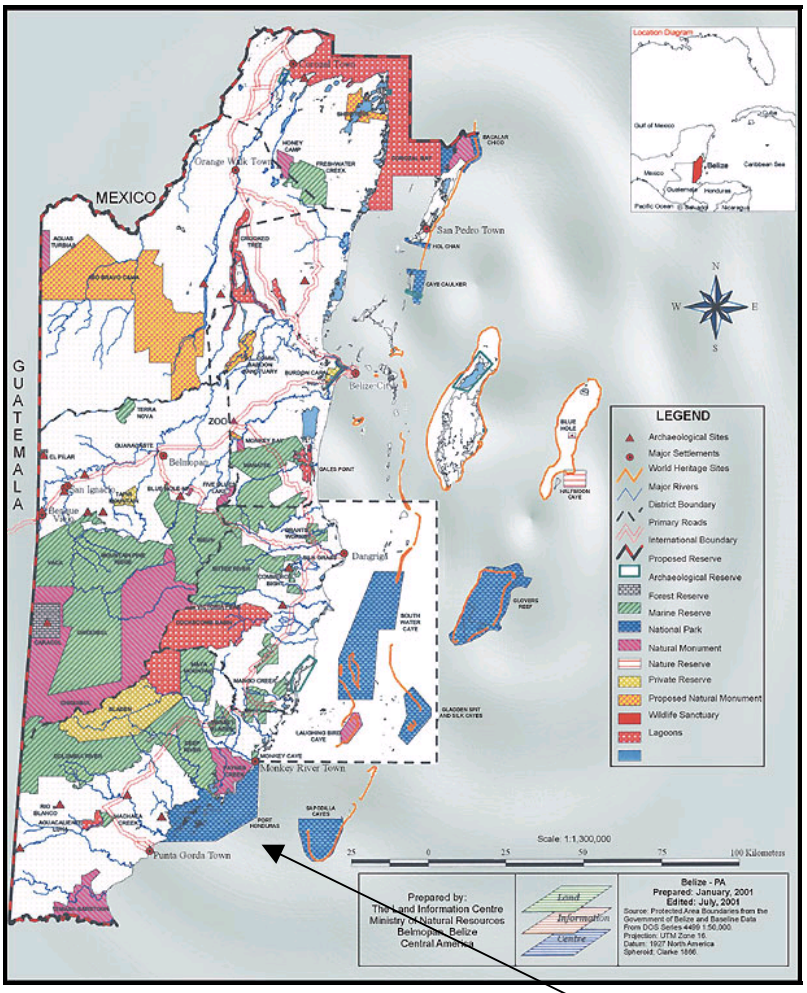


Figure 1c: Protected areas of Belize

Port Honduras Marine Reserve

The PHMR is bordered in the north by Monkey River Town (16˚ 20'N Latitude and 88˚ 25'W Longitude), in the south by the Rio Grande River (16˚ 08'N Latitude and 88˚ 45'W Longitude), to the west by the mainland coast of Belize, and to the east by all the near-shore Cayes to the Snake Cayes (16˚ 08'N Latitude, 88˚ 26'W Longitude) (TIDE PHMR Management Plan, 1999). The southern border of the PHMR lies just to the north of Punta Gorda Town. Punta Negra Village is situated on the coast of PHMR, about halfway between Monkey River and Punta Gorda. (Figure 1d)

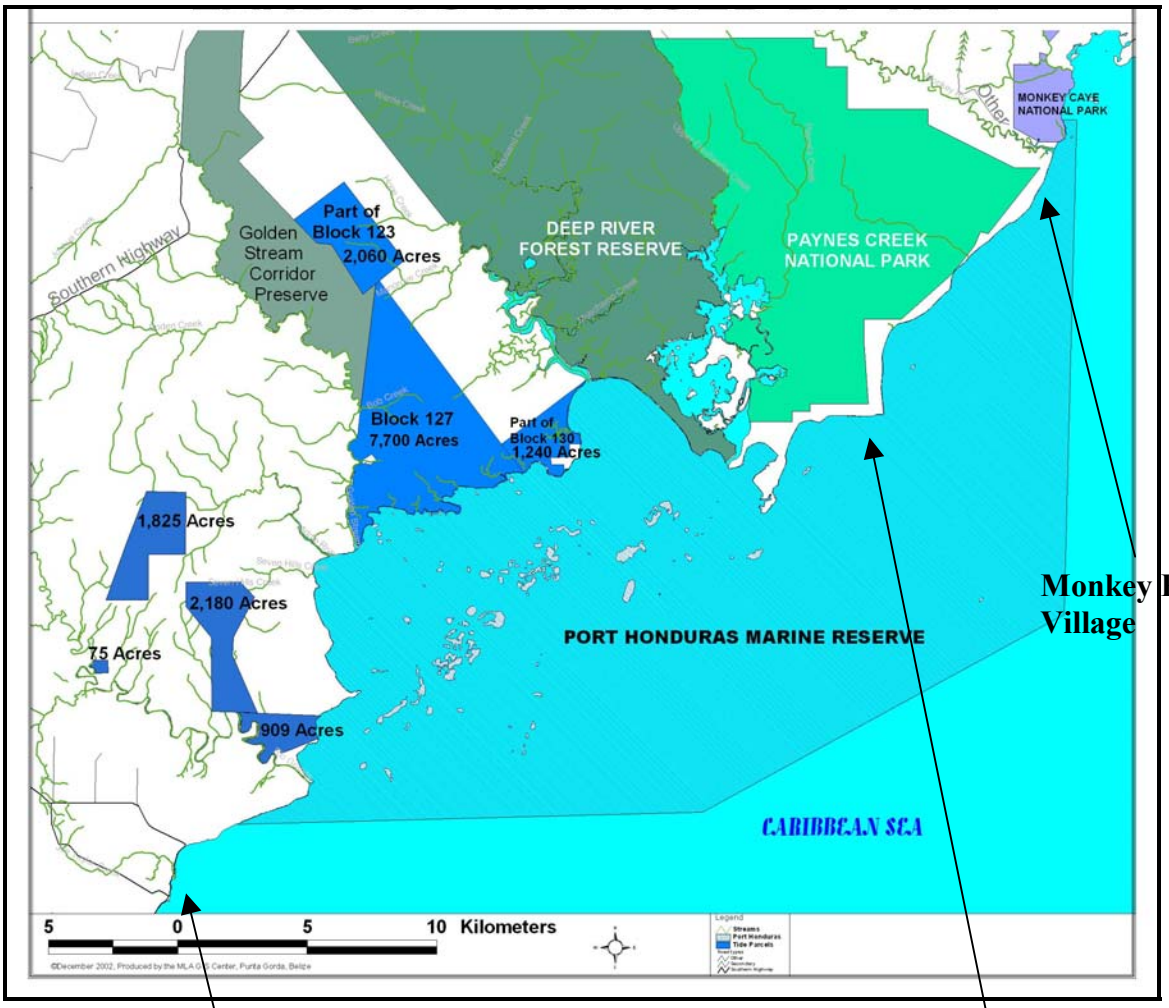


Figure 1d: Port Honduras Marine Reserve and surrounding coastal communities, Toledo, Belize

Of the six districts in Belize, the southernmost Toledo District is the most rural, wild, undeveloped and often referred to as the "forgotten district". (Figure 1e) It is also the poorest district in Belize, with per capita income estimated at less than US$800 per individual (per capita income in Belize is US$2,910) (Mahler, 1999 and http://www.worldbank.org/annualreport/2002/box/table6_1.pdf). Punta Gorda, the unofficial capital of the Toledo District, is perched on the coast of the Gulf of Honduras, and lies at the end of the (almost fully paved) Southern Highway, providing the only road access to this part of Belize. With a total population of about 4,700 people, Punta Gorda is only home to approximately 60 fishers (DoF, Punta Gorda office, personal communication, 2004). While Punta Gorda boasts five major ethnic groups: the Creole, Garifuna, Mestizo, East Indian and Mayas (Kekchi and Mopan), the principal language spoken throughout Toledo is English (Eltringham, 2001).

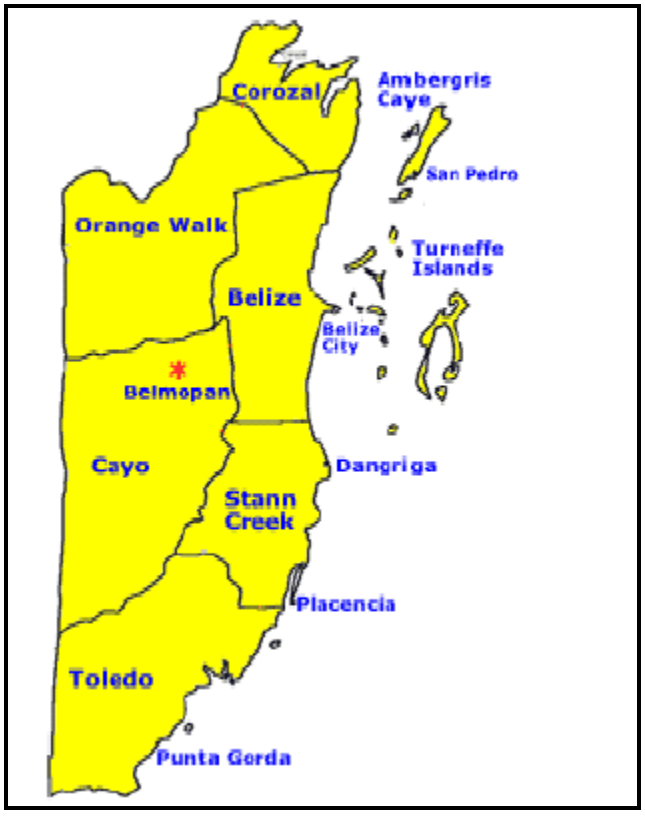
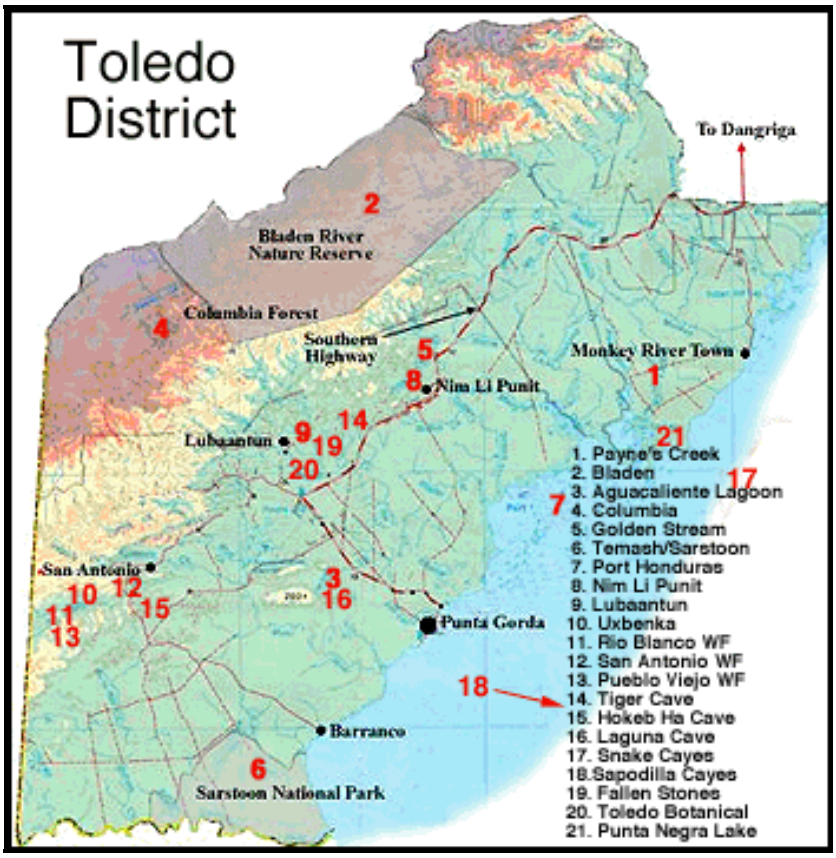


Figure 1e: Districts in Belize and

Toledo District, Belize



There are five main streets that run parallel to the sea, Front Street, Main Street, Back Street, West Street and Far West Street. (Figure 1f) A park and clock tower are positioned at the center, and the market, most government and private businesses, hotels, restaurants and stores are located off of this relatively small, triangular green area. Private residences line these four main streets that stretch from West to East, with small corner (grocery) stores found here and there, standing alone or as part of a residence. Also near the center of town, due northwest from the market, at the top of Prince Street, lies the airstrip, inconveniently located between the main residential areas and newer, more recently cleared and inhabited areas to the west, or back of Punta Gorda. These areas are known as Indianville, because of the Kekchi Maya population that

have settled there, and Water Supply area, because of the water tank that supplies the growing neighborhood behind Far West Street (Martinez F., personal communication, 2004).

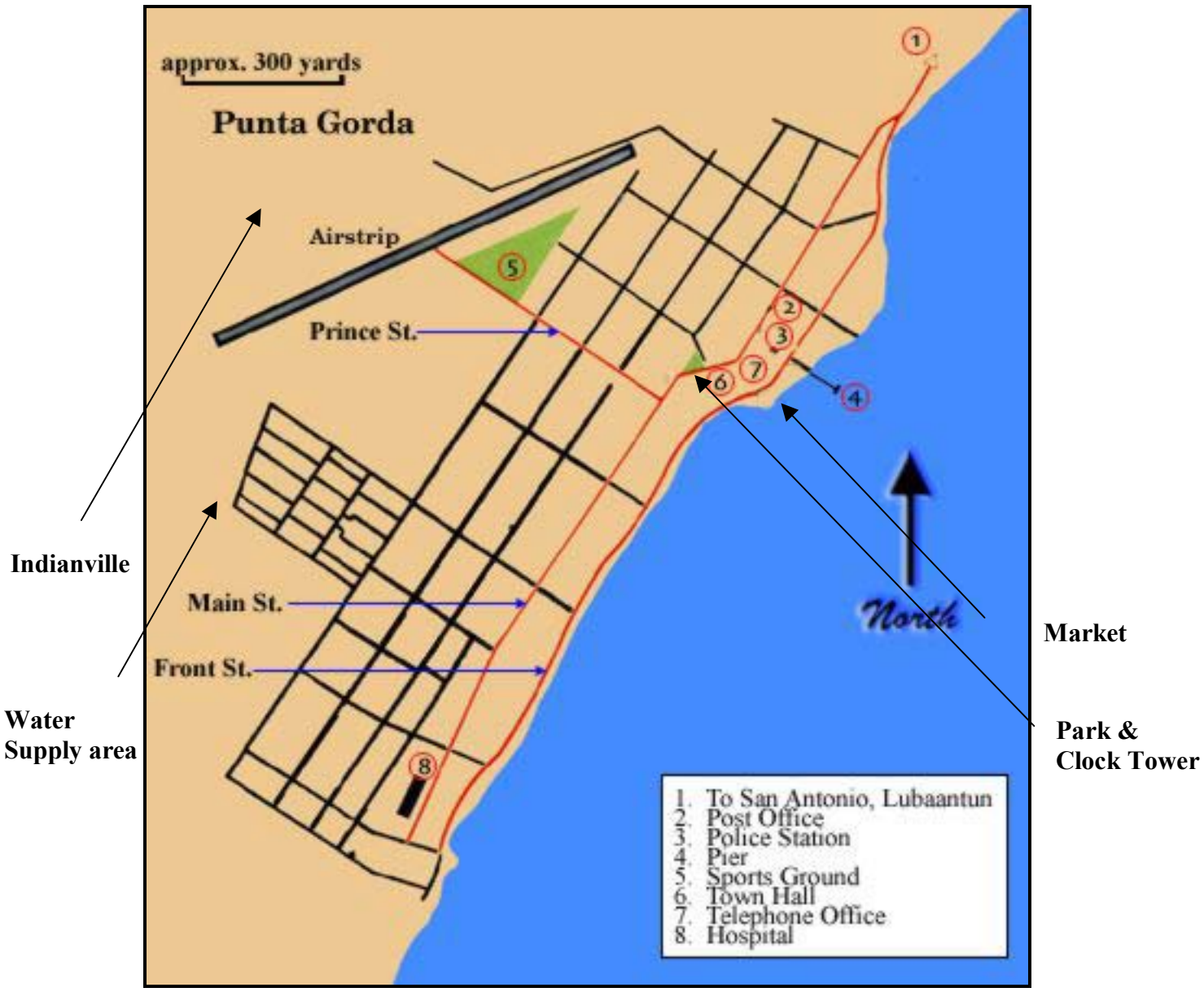


Figure 1f: Punta Gorda Town, Toledo, Belize

The small Creole fishing village of Monkey River Town (its former population allows it to officially retain "Town" status) located near the northern boundary of the PHMR has a total population of about 200 people (approximately 40 of which are children and 30 are fishers). (http://www.southernbelize.com/monkeyriver.html and Muschamp, 2004). The village, located on the southern banks at the mouth of the Monkey River, was totally destroyed by Hurricane Iris in October 2001. (Figure 1g and Figure 2)

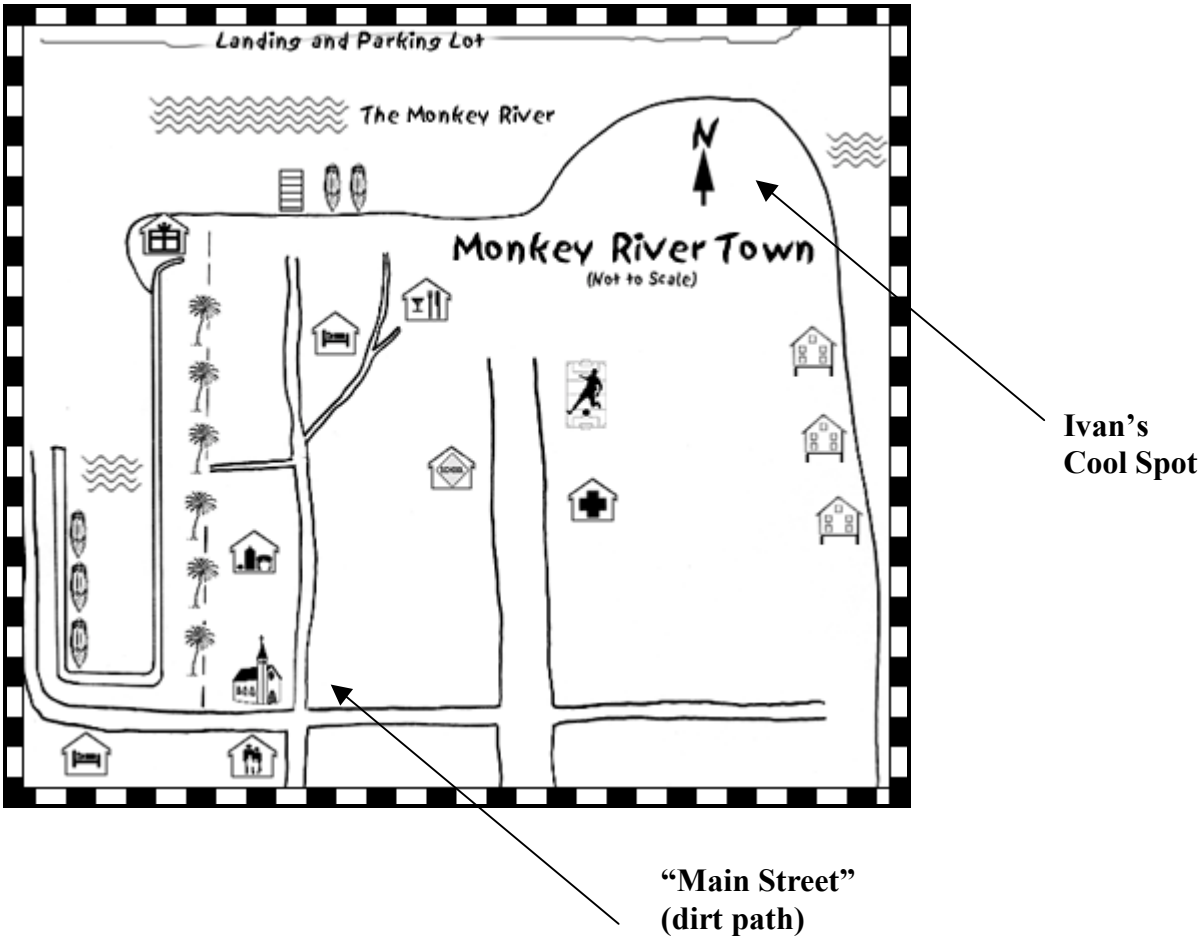


Figure 1g: Map of Monkey River Town, Toledo, Belize

Figure 2: Aerial view of the Monkey River and Monkey River Town, Toledo, Belize

The village only recently got a water system installed back in the village, and they are still without 24 hour electricity. The village covers about 20 acres with approximately 40 buildings, including a school, community center/hurricane shelter, a general store, three restaurants, two bars and a hotel. A dirt path runs down the center of the village, and serves as the "Main Street". (Figure 3) A 22km dirt road on the north side of the River connects the village to the Southern Highway, although the easiest access to Monkey River is by boat (Eltringham, 2001).

Figure 3: "Main Street" Monkey River Town, Toledo, Belize

Punta Negra Village, on the coast in the PHMR, is also a small Creole fishing community of about 25 people (10 of which are children and 10 are fishers), descendents from about four families that have been settled in Punta Negra for about 100 years (Jacobs, R., personal communication, 2003). The village sits on a pretty stretch of white sandy beach dotted with palm trees. (Figure 4) There are just a scattering of houses and a community center that doubles as a school, church, meeting house and a place for special gatherings and weddings. There is no road access, running water or electricity, but like Monkey River, there is a community phone for public use.

Figure 4: Punta Negra Village, Toledo, Belize (photo courtesy of www.tidebelize.org)

Ninety five respondents from Punta Gorda, Monkey River and Punta Negra were included in this study, out of 108 total surveys. (Table 1). Head of household (Household) respondents included non fisher residences for the most part and that designation was chosen in order to determine the level of knowledge and familiarity with the PHMR and TIDE compared to that of the fishers sector. Fisher respondents included commercial fishers and sport fishing guides, who occasionally doubled as both, but not as head of household. The majority all of the respondents hailed from Punta Gorda, due to time and financial constraints, and better access to a larger population. The number of respondents represent a small percentage of the three PHMR coastal communities, but it is hoped the study will still be able to provide some insight into what the socioeconomic impacts of the PHMR have been in the past five years, what the future role of the people will be as they relate to the PHMR and how these communities can eventually benefit from future economic and sustainable development in the region.

Table 1: Number of respondents surveyed by village and category

	# Households surveyed (non-fisher)	# Fishers (commercial & sport) surveyed
Village		
Punta Gorda	64	19
Monkey River	4	4
Punta Negra	0	4
Total number = 95	**68**	**27**

Twenty people from major stakeholders groups in Punta Gorda, Monkey River and Punta Negra were also formally interviewed for this study. These people hold positions in the following sectors: regional or town government, village council, non government, tourism and hospitality, education and fishery. Some of these representatives have a direct involvement with the PHMR (some sit on the advisory board of the PHMR or the Board of TIDE) and some have an indirect involvement with the PHMR (their clients – tourists – are dependent on the PHMR). (Table 2) Many of these people hold multiple positions within the community, and there is a lot of crossover. It should be noted that not all positions are unique to each interviewee.

Table 2: Number of stakeholders interviewed by village and sector

	Regional government	**Town government & village council**	**Non-government**	**Tourism & hospitality sector**	**Education sector**	**Fisher & COOP sector**
Village						
Punta Gorda	2	1	2	3	2	3
Monkey River	0	1	0	2	0	2
Punta Negra	0	1	0	1	0	0
Total number = 20	**2**	**3**	**2**	**6**	**2**	**5**

2.2 Surveys

Two survey and two interview instruments were developed over a period of about two and a half months, from Nov. to Dec. 2003: Household Survey (Form 1, Appendix 1), Commercial / Sport fishermen Survey (Form 2, Appendix 2), Stakeholder Interview Form (Form 3, Appendix 3) and PHMR Management Effectiveness Interview Form (Form 4, Appendix 4). The Household survey form was designed to answer questions with regards to general demographics, daily life and occupation, living and accommodations, availability and cost of seafood, and level and understanding of distribution of PHMR information. The Commercial / Sport fisherman survey asked questions with regards to general demographics, vessel and gear information, fishing and effort, catch to market, cost of seafood and income, training, bookings and income, and species location, availability and abundance.

The Stakeholder Interview Form contained questions about occupation, degree and satisfaction of participation in PHMR management, awareness and understanding of PHMR rules and regulations, level and quality of information and training provided to participate in management, degree of training in sustainable resource use and level of participation in PHMR surveillance and enforcement. The PHMR Management effectiveness interview form included questions under the following categories: occupation, PHMR management plan, degree and quality of training provided to PHMR resource users, availability of resources for PHMR surveillance and enforcement, degree and quality of PHMR enforcement, and degree and quality of PHMR education and marketing programs. All four forms included a suite of questions about the PHMR, including position about the PHMR declaration, perception of the PHMR coastal and marine environment, impacts and threats, management, and current and future fishing regulations

in Belize and in the PHMR. All surveys ended with general questions about the community from which the respondent hailed.

All surveys were designed using selected socioeconomic and governance indicators from the IUCN/WWF/NOAA "How is your MPA Doing?" Working Draft Guidebook (Pomeroy et al., 2002). Information and guidelines from the Socioeconomic Monitoring Guidelines for Coastal Managers in the Caribbean: SOCMON Caribbean were also included in the surveys (Bunce et al., 2003). The Household and Commercial / Sport fishermen surveys were tested and revised with feedback given by various community members before being finalized and implemented.

After consultation with TIDE and TNC, it was decided that a student with the University of Belize Toledo campus, originally from the nearby Maya village of San Pedro Columbia, would assist with conducting the Household and Commercial / Sport fishermen surveys in Punta Gorda. This would ensure access to all ethnic groups (many Mayans only speak Spanish, Kekchi Mayan or Mopan Mayan dialects, and no English) and assure a better understanding of the information gathered (many residents in Punta Gorda speak Creole which can at times be hard to understand and vice versa). It proved to be critical to have this help, since many times it was difficult to convey the questions in English, let alone fully comprehend the answers. While the student helped the author conduct the majority of the surveys, he was not present for all of them, nor was the author present when the student conducted all of his surveys.

2.3 Households

Eighty-one total households in Punta Gorda and Monkey River were surveyed, with an 84% successful response rate equaling 68 respondents. The surveys were conducted by randomly visiting residential households, including those affiliated with local businesses, from

Monday through Friday between about 9 am and noon, and 1pm and 5pm. Some households and businesses were visited between 9am and 12 pm on Saturdays. Because many women go to the market to shop on market days (Monday, Wednesday, Friday and Saturday), it was more difficult to survey on those mornings. Subsequently, because those market days also brought in all the Mayan villagers on buses from the outlying communities, it was more difficult to survey businesses on those days as well. There were no surveys conducted on Sundays because of the strong religious foundation within the community that essentially made this day a day of prayer and rest.

Three trips were taken to Monkey River, one in November 2003, one in February 2004 and one in March 2004. Households were surveyed during the February and March trips only, also by randomly visiting residential households, as well as those that are affiliated with local businesses. These households were surveyed during the week, between 8:30am and noon, and 1pm and 4pm. Two trips were taken to Punta Negra, one in November 2003 and one in February 2004. Households here were informally interviewed (without survey forms), however household representatives from Punta Negra were subsequently (and also informally) interviewed in Punta Gorda at a later date.

The surveys were usually conducted in the household respondents' house or place of work (i.e. if they lived and worked in the same structure), and lasted an average of 45 minutes. Respondents were initially asked how long they had lived in the community, and if it was less than three years, the interview was usually terminated. This was rarely the case, with most respondents having been residents of Punta Gorda, Monkey River or Punta Negra for their entire lives. The three most important categories that were looked at within the communities to ensure a fair coverage of responses were ethnicity, education and occupation. By randomly striving to

ensure that all ethnic groups, education levels and occupational categories were surveyed, we could feel confident that we had fairly covered the most important segments within the community.

2.4 Commercial fishers / Sport fishing guides

Twenty seven commercial fishers and sport fishing guides in Punta Gorda and Monkey River were surveyed, with a 100% response rate. In Punta Gorda, most commercial fishers were surveyed by locating them at the market, under the Wisdom Tree (a large tree at the southeastern end of Front Street where many subsistence fishers tie up their dories and canoes) and by the fueling dock, under the trees at the Texaco Station. (Figure 5) Some fishers were located at the Rio Grande Cooperative (the COOP), also on Front Street, and some were found after one fisher gave the name of another. Other commercial fishers were located at their houses, particularly in the late afternoon after a day of fishing. Mid-to late morning on market days (Monday, Wednesday, Friday and Saturdays) was usually the best times to locate the fishers, however many times they simply proved to be elusive, not following any schedule or committing to meet at any particular time.

Figure 5: The Wisdom tree on Front Street, Punta Gorda, Toledo, Belize

Sport fishing guides were as difficult to locate, mostly because of the nature of their work, however after obtaining a list with phone numbers of guides from TIDE Tours, a local tour operator and subsidiary of TIDE, calls were made and appointments were arranged at their convenience. In Punta Gorda, all sport fishing guides are commercial fishers too (Garbutt, Scully, personal communication, 2004). These surveys were conducted at the respondents house, or at an agreed upon public location, usually a local bar or restaurant.

Fishers were surveyed during all three trips to Monkey River. Here, every commercial fisher is a tour guide, and most, but not all tour guides are sport fishing guides (Garbutt, Sonny, personal communication, 2004). There is no market in Monkey River, so most commercial fishers who dive for lobster sell to the Northern Fisherman's Cooperative (NFC) in the nearby town of Independence (also referred to as Mango Creek). Since lobster season was closed during the last two trips to Monkey River (the season closes Feb. 15th and reopens June 15th), many

fishers were found in and around the village, if they were not out guiding (tourist season peaks February to April). And, if they were not out fishing, sport fishing guides were found in the village. When they were not working, both commercial and sport fishing guides could be found at Ivan's Cool Spot, a bar on the beach at the very spot where the river meets the sea, or working on lobster traps and shades at the back part of town, on the lagoon where most of the boats are tied up. (Figure 6)

Figure 6: Lagoon at the back of Monkey River Town, Toledo, Belize

Most all interviews were conducted at a bar or restaurant, with the exception of one that one was conducted across the river at a construction site, away from the "center" of the village. Commercial and sport fishing guides from Punta Negra were surveyed in Punta Gorda, at the market or the COOP, or at their second home, since there were no fishers present when the village was visited (many Punta Negra residents have second residences in Punta Gorda since there are no modern conveniences located in that village).

Surveys with both commercial and sport fishing guides lasted approximately one hour, with many lasting closer to one hour and a half. Respondents were all known to have lived in their communities for longer than five years, with many never having left, and all were familiar with the PHMR.

2.5 Stakeholder / PHMR management

Seventeen PHMR stakeholders from Punta Gorda, Monkey River and Punta Negra were interviewed. Some of these persons held regional government positions, and mayoral and local village council positions. Others held positions with the local Tourism Board and Tour Guide Associations, the University of Belize and the local Fishermen's Cooperative. Two were members of TIDE's board, and the others were the manager of a popular fly fishing lodge and the owner of a local restaurant, who also owns one of the Cayes in the PHMR. The remaining interviewees were concerned fishermen and tour guides who had a chance to spend more time than the survey asked for, or had additional knowledge about the community, establishment of the PHMR and/or comments and insight about its management.

Most interviewees were contacted by phone, or through their offices, and appointments were made to sit down with them and talk about their role in the community, their perception and in some case their involvement with the PHMR and its management. The Stakeholder Interview form was used as a guide, however most of the time the interview followed a more informal course. Most interviews were conducted during the week at the interviewee's place of business, their house, on a boat or at a public location such as a bar or restaurant, with one interview requiring travel to the capital city of Belmopan.

Two members of the TIDE management team, the Executive Director and Manager of the PHMR were interviewed, as well as the Supervisor of the Department of Fisheries in the Punta Gorda office. The PHMR Management Effectiveness Interview Form was used on only one occasion, since one of the other interviews was held in a much more informal setting and the other was held over the phone with time constraints.

3.0 RESULTS

3.1 Household and fishers demographics

The demographic data in Table 3 reveals that an almost even number of males and females were surveyed with regards to the household respondents. This reflects current data from the Belize Central Statistics Office 2003 mid-year population estimate (breakdown by gender) which shows in Punta Gorda, 2,300 men and 2,500 women (CSO, 2000). Not surprisingly, a disproportionate amount of males were surveyed for the fisher respondents, with only one fisher being a female.

While the largest ethnic group in Belize is classified as Mestizo/Spanish (48.7%), the majority of people living in Toledo District are of Mayan descent (62.6%) (CSO, 2000). In Punta Gorda, almost half the population is Garifuna (Mahler, 1999). The results from this study show that 46% of household respondents are Garifuna, with the remaining not surprisingly, a mix of Creole, Maya, Mestizo and East Indian (the category "other" was represented as Caucasian and Hispanic). Fishers surveyed were represented from all major ethnic groups, with Creole having the strongest representation at 44%, followed by Garifuna at 26%. This is only a sample of the population, therefore a census would be able to further determine whether or not the Garifuna are representative of the Punta Gorda household population, and if the Creole are in fact representative of the fishing population in southern Belize.

Table 3: Gender, ethnicity and age demographics of households and fishers

	Household Total n=68 (non-fisher)
	percentage (number)
Gender	
Male	46% (31)
Female	54% (37)
Ethnicity	
Garifuna	46% (31)
Mestizo	10% (7)
Maya (Kekchi)	10% (7)
Creole	18% (12)
East Indian	10% (7)
Other	6% (4)
Age	
>15 years old	1% (1)
18-30 years old	34% (23)
31-40 years old	28% (19)
41-50 years old	21% (14)
51-60 years old	3% (2)
>60 years old	13% (9)

	Fishers Total n=27 (commercial & guides)
	percentage (number)
Gender	
Male	96% (26)
Female	4% (1)
Ethnicity	
Garifuna	26% (7)
Mestizo	19% (5)
Maya (Kekchi)	4% (1)
Creole	44% (12)
East Indian	7% (2)
Other	0% (0)
Age	
>15 years old	0% (0)
18-30 years old	37% (10)
31-40 years old	22% (6)
41-50 years old	19% (5)
51-60 years old	15% (4)
>60 years old	7% (2)

Table 3 also shows there was not a lot of disparity among the age of household respondents surveyed: most were between the ages of 18-30 (34%) and 31-40 (28%). It was observed that there is definitely a growing population in southern Belize: the total population of Punta Gorda has grown from 4,329 in 2000, to 4,600 in 2002 to an estimated 4,800 in mid-2003 (CSO, 2000). Table 4 shows that 37% of households have between 5-6 people living under their roof. This is indicative of a growing population and growth among the younger generation.

Like household respondents, fishers that were surveyed fell evenly across all age categories, with the majority also between the ages of 18-30 and 31-40. Many of the older fishers are retiring from the commercial fishing industry because it is not profitable to them anymore; many also do not have the capability and equipment to become sport fishing guiding. The younger fishers are able to afford staying in the commercial fishing industry, since diving for lobster and conchs can still be worth the effort. If they can also substitute their livelihood with guiding, they have a chance to turn a profit after expenses. The PHMR, and the increase in tourism, has been a great incentive to them as well.

Table 4: Household respondent's level of education and number of people per household

	Household Total n=68 (non-fisher)
Education	
None	6% (4)
Below high school	41% (28)
High school	31% (21)
Some high school	6% (4)
University	16% (11)
Graduate school	0% (0)
# people per household	
1-2 people	22% (15)
3-4 people	22% (15)
5-6 people	37% (25)
7-8 people	12% (8)
>8 people	7% (5)

3.2 Household respondent's education, people per household; fisher's experience

Table 4 shows that over 75% of household respondents have below a high school education, indicating that with this low level of education, these community members will most likely not be engaged in a high level or quality occupation. Unlike primary school education, families have to pay to send their children to high school, which would also explain the low numbers of high school graduates.

As previously mentioned, there are a high number of people living in these households. While 5-6 people in each household represents 37% of total households surveyed, 22% said 1-2 people and another 22% said 3-4 people live in their households. This reflects the many single (widowed) older women living alone and single, younger women at home with children, respectively.

Most fishers surveyed are commercial fishers (60%) and the majority have been fishing for at least 10 years. (Table 5a and 5b) Only 7% of fishers are exclusively sport fishing guides, and have not been at it for very long, with only one fisher - the top fly fishing guide in the area – guiding for between 10-20 years. Commercial fishers who are also sport fishing guides represent 33% of total fishers surveyed, and these fishers have been fishing most of their lives. This represents the trend that many commercial fishers, especially from the younger generations are becoming sport fishing guides, because of both the increase in fly fishing in southern Belize (due to the PHMR) and the overall increase of tourism in Belize.

Table 5a: Type of fisher and level of experience (1)

Number of years fishing	0-10 years	10-20 years	20-30 years	30-40 years	> 40 years
Type of fisher					
Commercial	7	4	1	2	2
Sport fishing guide	1	1	0	0	0
Both	0	5	4	0	0
Total n=27	**8**	**10**	**5**	**2**	**2**

Table 5b: Type of fisher and level of experience (2)

	Fisher Total n=27 (commercial & guides)
Type of fisher	
Commercial	60% (16)
Sport fishing guide	7% (2)
Both	33% (9)
Years fishing	
0-10 years	30% (8)
10-20 years	37% (10)
20-30 years	19% (5)
30-40 years	7% (2)
>40 years	7% (2)

3.3 Household respondents' distribution by occupation

In 2000, only 50% of working age Belizeans were employed, and the most recent figures for 2002 show Belize's unemployment rate at 9.1% (CIA World Factbook, 2003). Daily life and occupation findings across household respondents show that most (33%) respondents fall under the "housewife/domestic work" category. (Table 6) Most of these respondents are technically unemployed, although only 4% of respondents answered "unemployed" when asked what their day-to-day occupation was. This would reflect the majority of women who are unemployed and/or stay at home doing domestic and household work. While tourism is a definite employment option, especially for this sector, the majority are not involved in tourism today.

Sixty nine percent of respondents are not involved in the tourism industry. According to the Belize Tourism Board (BTB), total tourist arrivals into Belize have increased from 166,743 in 1998 to 186,097 in 2002 (BTB, 2004). Although no reliable statistics exist for tourist arrivals into Punta Gorda (attempts to even try to obtain them were left unanswered), personal observation and communication over a six-month period suggest arrivals have increased in the past few years (this would also be due to the recently paved Southern Highway and the convenience of five daily flights on two separate airlines). With regards to the PHMR and its management, 85% of respondents have no affiliation with TIDE or the DoF, however of the 15% of respondents who currently do, 50% of those previously worked in some capacity for TIDE.

Table 6: Household respondents' distribution by occupation

	Household Total n=68 (non-fisher)
Occupation	
Housewife/domestic work	33% (26)
Cooks/bakes/sells goods	4% (3)
Manager local business/company	6% (5)
Scientist/medical/vet	3% (2)
Entrepreneur	4% (3)
Seamstress/quilt maker	2% (3)
Store/restaurant/bar owner	16% (13)
Teacher	5% (4)
Hotel/inn keeper	3% (2)
Tour guide/operator	1% (1)
Store clerk/waitress/bartender	5% (4)
Carpentry/masonry/electrician	1% (1)
Military	1% (1)
Local gov't	1% (1)
Unemployed	4% (3)
Hunter/farmer/fisher	8% (6)
Musician/artist	3% (2)
Changed occupation in five years	
Yes	28% (19)
No	72% (49)
Involved in tourism industry	
Yes	31% (21)
No	69% (47)
Involved with management of PHMR	
Yes	15% (10)
No	85% (58)
How involved with management of PHMR	**N=10**
Family works(ed) for TIDE	30% (3)
Respondent worked for TIDE	50% (5)
Supplier to TIDE	10% (1)
Attends PHMR board meetings	10% (1)

TIDE may not be a major employer in the region at this time, but it can potentially help the tourism sector "jump start" with regards to employing people in the hospitality business, as rangers and as tour guides – all pointing towards getting the population to find alternative activities that lessen their demands on the resource base.

3.4 Commercial and sport fishing guides distribution by fishing effort

Table 7a shows commercial fishers that were surveyed are mostly the captains of their vessels (68%), and while 28% said they act as captain and crew, 4% consider themselves crew only. The majority of these fishers fish on average 3-4 days per week (44%) and 24% fish 1-2 days per week. Therefore most commercial fishers are fishing less than one would expect from a town with a commercial fishing industry and a Fishermen's Cooperative (the COOP). Fishing for three to four days a week seems to qualify for local consumption only, not for any other market (such as the export market). Fifty two percent of commercial fishers fish for 4-6 hours per day. Also known as "soak time", the amount of time the fishers' gear is in use in the water, 20% fish for 7-9 hours per day and 16% fish for 10-12 hours. This would point to fishers who are just going out for a few hours to catch and sell that day (at the market) and others who are either going out to the Cayes, and camping overnight to maximize fishing time and save fuel, or those who are hardcore divers during the lobster and conch season.

Table 7a: Commercial and sport fishing guides distribution by fishing effort

	Fisher Total n=25 (commercial)
Fishing effort (trips/week)	
1-2 days/week	24% (6)
3-4 days/week	44% (11)
5-6 days/week	12% (3)
>6 days/week	20% (5)
Fishing effort (hours/day)	
1-3 hours/day	4% (1)
4-6 hours/day	52% (13)
7-9 hours/day	20% (5)
10-12 hours/day	16% (4)
>12 hours	8% (2)

	Fisher Total n=10 (guides)
Fishing effort (trips/week)	
1-2 days/week	20% (2)
3-4 days/week	50% (5)
5-6 days/week	10% (1)
>6 days/week	0% (0)
Other	20% (2)
Fishing effort (hours/day)	
2-4 hours/day	0% (0)
4-6 hours/day	10% (1)
6-8 hours/day	40% (4)
8-10 hours/day	40% (4)
>10 hours	10% (1)

One hundred percent of sport fishing guides surveyed replied that they are the lead or head guide, not just on board training to become a guide. Forty two percent of sport fishing guides are fly fishing guides, while the remaining 58% are evenly split, fishing with spinning rods and trolling out in deeper waters. Most sport fishing guides work on average 3-4 days per week (50%). Twenty percent guide 1-2 days per week and 10% guide 5-6 days per week. No one guides more than 6 days per week, and 20% answered "other". "Other" refers to guides who work for a lodge that rotates their guides (minimum every seven days, unless a guide is specifically requested by a client, and will fish for over a week straight (Garbutt, Scully, personal communication, 2004)), or a guide who maybe only averages 10 trips per year. Most guides take clients out on average for 6-8 hours (40%) or 8-10 hours (40%). Other guides, maybe those taking out beginners, will go out for 4-6 hours (10%), while other guides who are hired privately by well skilled and enthusiastic fly fishers, for more than 10 hours each day (10%).

3.5 Commercial and sport fishing guides vessel information

Table 7b shows that 78% of fishers own their own boats, with 67% owning one boat, and 33% owning two boats, and 78% of all those boats being skiffs. Fifteen percent of fishers use dories and 7% use canoes. The majority of boats are between 21-24 ft. Most fishers use outboard motors (73%), even with fuel prices so high, fishers need power to fish far out from shore, or when guiding, to move from flat to flat.

Table 7b: Commercial and sport fishing guides vessel information

	Fisher Total n=27 (commercial & guides)
Fishers who own or borrow their boats	
Own	78% (21)
Borrow	22% (6)
Number of boats fishers own	
1 boat	67% (18)
2 boats	33% (9)
Type of boat fishers own	
Skiff	78% (21)
Dory	15% (4)
Canoe	7% (2)
Size of boat	
>13 ft.	4% (1)
13-16 ft.	22% (6)
17-20 ft.	22% (6)
21-24 ft.	30% (8)
25-28 ft.	22% (6)
>29 ft.	0% (0)
Means of power on boat	
Outboard motor	73% (21)
Sail	10% (3)
Paddles	17% (5) *one uses sail and paddles

3.6 Household and fisher's perception of the marine environment

Household and fishers were asked several questions with regards to the overall health of the PHMR marine and coastal environment, major impacts to the PHMR today, potential threats to the PHMR in the future and whether or not the PHMR has had any impact on household respondent's and fishers livelihoods and income. Table 8 shows that both households and fishers rate the PHMR environment as healthy (45% and 52% respectively), although 35% of household respondents rated the PHMR's marine and coastal environment as just ok.

Regarding a major activity affecting the PHMR today, 32% of household respondents said there are none, while 28% of fishers said illegal fishing. However, illegal fishing was raised as a major activity in the PHMR for 31% of household respondents. This is consistent with many reports from respondents, stakeholder and non stakeholders group: illegal fishing is a major activity and serious threat in the PHMR. Most all respondents commented on Guatemalans and Hondurans fishing and diving for lobster and conchs when the season is closed in Belize, or squatters on the Cayes who set gill nets illegally at night.

When household respondents were asked what they think the most serious threat will be to the PHMR in the future, the majority answered none (29%). Twenty nine percent of fishers said illegal fishing again.

Table 8: Household and fisher's perception of marine environment

	Household Total n=68 (non-fisher)	**Fisher Total n=27** (commercial & guides)
	percentage (number)	percentage (number)
Condition of PHMR marine environment		
Healthy	45% (26)	52% (14)
Fairly healthy	18% (10)	22% (6)
OK	35% (20)	22% (6)
Fairly poor	2% (1)	4% (1)
Poor	0% (0)	0% (0)
Major impact affecting the PHMR today		
Overfishing	5% (4)	6% (2)
Illegal fishing	31% (25)	28% (10)
Tourism	4% (3)	6% (2)
Development	1% (1)	3% (1)
Climate (weather)	3% (2)	9% (3)
Pollution	16% (13)	17% (6)
None	32% (26)	11% (4)
Other	8% (6)	20% (7)
Major threats to the PHMR in the future		
Illegal fishing	20% (17)	29% (12)
Overfishing	8% (7)	14% (6)
Tourism	8% (7)	8% (3)
Development	4% (3)	0% (0)
Climate (weather)	4% (3)	13% (5)
Pollution	10% (8)	13% (5)
Violation of PHMR laws	2% (2)	5% (2)
None	29% (24)	10% (4)
Other	15% (13)	8% (3)
Status of coastal & marine resources		
Well protected	32% (21)	15% (4)
Somewhat protected	43% (28)	70% (19)
Not protected (fishers only)	-	4% (1)
No opinion	25% (16)	11% (3)

(Table 8 continued)	Household Total n=68 (non-fisher)	Fisher Total n=27 (commercial & guides)
	percentage (number)	percentage (number)
Status of commercially important species		
Well protected	31% (20)	11% (3)
Somewhat protected	43% (28)	70% (19)
Not protected (fishers only)	-	15% (4)
No opinion	26% (17)	4% (1)
Communities opinion of marine resources now vs. 5 yrs		
More concerned	28% (18)	40% (11)
Somewhat concerned	41% (26)	30% (8)
No effect	31% (20)	19% (5)
No opinion	-	11% (3)
Effect of PHMR on income		
Very positively	0% (0)	0% (0)
Positively	8% (5)	30% (8)
No effect	89% (58)	63% (17)
Negatively	3% (2)	7% (2)
Very negatively	0% (0)	0% (0)
Effect of PHMR on livelihood		
Very positively	2% (1)	7% (2)
Positively	11% (7)	33% (9)
No effect	84% (55)	53% (14)
Negatively	3% (2)	7% (2)
Very negatively	0% (0)	0% (0)

Looking at household respondents perception of the coastal and marine resources since the PHMR was declared, 43% of respondents see it being somewhat protected. Seventy percent of fishers declared somewhat protected as well. While household respondents may have less familiarity and awareness of the PHMR, fishers that were surveyed, who are very familiar with the PHMR and its resources, definitely confirmed that the PHMR is in good condition. These perceptions also hold true regarding the status of commercially important species – such as lobster and conchs. Forty three percent of household respondents and 70% of fishers say that since the PHMR was declared they are being somewhat protected. Most all respondents proclaimed they would have answered well protected, however everyone wanted to point out that there is always more work, where protection is concerned, that can be done. And with the high occurrence of illegal fishing in the PHMR, everyone wanted to point out that this is the one activity that is causing their marine resources to be not protected.

When respondents were asked how concerned coastal communities are about marine resources and the PHMR today since the declaration of the PHMR, 41% of respondents said people today are somewhat concerned, and 40% of fishers said they are more concerned. There was an overall feeling that the establishment of the PHMR has done a lot in the past five years to raise awareness of marine conservation in the area, and this is also reflected in the work TIDE has accomplished within the coastal communities of the PHMR.

Household and fisher respondents were also asked if they felt the creation of the PHMR has had any effect on their on their income and their day-to-day livelihoods. Eighty nine percent of household respondents said the PHMR has had no effect on their income and 84% said there has been no effect on their livelihood. Sixty three percent of fishers said the establishment of the PHMR has had no effect on their income, and the majority, 53%, said there

has been no effect on their livelihood. This also reflects what the majority of the people feel when the PHMR is brought up: most do not see the real connection between resource use and their daily lives, and in many cases, survival. Heavy pressure on the marine resources will lead to overexploitation, and this overexploitation – such as illegal fishing – is a problem in the first place because people's income and livelihoods are the very thing suffering.

3.7 Household and Fishers Perception of PHMR Management

Regardless of whether or not household respondents were all that knowledgeable with the PHMR, almost everyone surveyed had heard of TIDE, the local NGO who has day-to-day responsibilities in the PHMR. When asked if TIDE should continue to have these management responsibilities in the PHMR, 80% of household respondents and 89% of fishers said yes. While many respondents had negative comments and many complaints about the work TIDE is doing in the PHMR, these numbers show that they still want TIDE around managing the PHMR. Household and fisher respondents were then asked to rate TIDE's management in the PHMR. The majority of household and fishers, 49% and 52% respectively, said they are doing a good job. Again, while many respondents voiced their criticisms, they all admitted that TIDE is doing the best job they can. Few wanted to admit that they are doing a great job, with everyone claiming that there is still room for improvement, and that TIDE has to work on combating illegal fishing in the PHMR. Regarding future challenges to managing the PHMR, the majority, 23%, of household respondents said none, while 43% of fishers said illegal fishing.

Table 9: Household and fisher's perception of management of the PHMR

	Household Total n=68 (non-fisher)	**Fishers Total n=27** (commercial & guides)
	percentage (number)	percentage (number)
Should TIDE continue to manage PHMR		
Yes	80% (53)	89% (24)
No	7% (5)	7% (2)
No opinion	13% (9)	4% (1)
TIDE's management of the PHMR		
Very good	13% (7)	15% (4)
Good	49% (27)	52% (14)
Ok	22% (12)	22% (6)
Bad	16% (9)	11% (3)
Very bad	0% (0)	0% (0)
Future challenge for managers of PHMR		
Research	1% (1)	0% (0)
Education	6% (5)	6% (2)
Conservation of resources	6% (5)	6% (2)
Training	2% (2)	3% (1)
Enforcement	9% (8)	3% (1)
Overfishing	2% (2)	3% (1)
Illegal fishing	20% (18)	43% (16)
Community participation	13% (11)	11% (4)
No opinion	23% (20)	6% (2)
Other	18% (16)	19% (7)

DISCUSSION

4.1 Coastal Communities

Unquestionably, the community of Punta Gorda is growing and will only become more stressed with an expected, drastic rise in population mostly due to immigration from neighboring countries, districts and villages. The Pan American highway will link up to Punta Gorda's Southern Highway from Guatemala and many Guatemalans are expected to immigrate to southern Belize. (Espat, personal communication, 2004). People from other districts within Belize are fleeing big cities like Belize City and Dangriga because of a steady rise in violent crime and drugs, for the peaceful, easygoing life in the south. And as Mayans and other villagers have abandoned traditional farming practices and other skills for a more practical life in town, they have been rapidly clearing land and settling in and around Punta Gorda. Children from many neighboring villages also move in to town to attend high school and eventually, obtain a higher education at the University of Belize, Toledo campus located in Punta Gorda.

Since many of the people who remain a part of the social fabric in Punta Gorda are uneducated and poor, there has to be an immediate movement towards improving the overall infrastructure, education and health care system, especially for the exploding younger population. Some of the major findings from the Caribbean Development Bank Poverty Assessment Report for Belize found, "Cayo and Toledo were the poorest Districts in the country. The percentage of the population indigent in Cayo and in Toledo was 19.7 and 47.2 percent respectively" (Kairi Consultants Ltd., no date). Even in communities like Monkey River and Punta Negra, members of the younger generations are missing out on a more home-schooled, cultural education and occasionally, access to a more modern and progressive education system

in favor of trying to develop alternative ways to survive in communities that are often without the basics, such as water and electricity.

Punta Gorda respondents live in moderate housing, with most structures being more than five years old, and in many cases on the verge of collapse. (Figure 7) However many households have running water to an inside tap, electricity – radios and televisions with cable are becoming standard – and gas stoves. Employment, and subsequently a lack of income are the most critical issues in southern Belize. When asked what the number one problem is in their community today, most respondents answered "no jobs"; when asked what they want to see change in their community in the next five years, the number one answer was "more jobs". The current situation is causing a very depressed and apathetic outlook with regards to the future. A similar situation, on a much smaller scale, exists in Monkey River and Punta Negra.

Figure 7: Houses in Punta Gorda, Toledo, Belize

To start with, goods and services in Punta Gorda and the Toledo District are some of the most expensive because all products must be transported by truck at over BZ$8 (>US$4) per gallon of fuel. For a fishing community, seafood prices in Punta Gorda have actually increased over the past five years, especially for easy-to-get and affordable finfish species like red snappers, jacks and grunts. Will there be any solution, for the population increase, the lack of education and employment, low income and increased food prices, and what will limit the impact of these issues, before they get out of control?

In Punta Gorda, most residents are limited as to where they may buy their fish and seafood. The market and the COOP are the two usual places that sell marine products. (Figure 8a and 8b). Mondays, Wednesdays, Fridays and Saturdays one can usually find snappers, jacks, grunts and sometimes barracuda and mackerel at the market, and lobster and conchs, when they are in season. Most local people do not buy lobster, since according to respondents prices hover between BZ$15-20 (US$7.50-$10) per pound, which is far too expensive when budgeting to feed a household of five people or more in a poor community. The COOP conducts most of its business during the week, with residents and local restaurants, and does best during the peak lobster and conch seasons (Jacobs, V., personal communication, 2004). Both the market and the COOP also sell jewfish, whole or filet, when available. (Figure 9)

In Monkey River and Punta Negra, snapper and snook are available directly from local fishers who fish from the sea and the river, on a daily, or every-other-day, basis. No one eats lobster since it is sold directly to the NFC in Independence. Conchs sell for about BZ$5-6 (US$2.50-3.00) per pound and when they are in season and available for sale, they are popular and just barley affordable, with the local population.

Figure 8a: Fish market (green building) and docks, Punta Gorda, Toledo, Belize

Figure 8b: Rio Grande Fishermen Cooperative, Punta Gorda, Toledo, Belize

Figure 9: Fisher filleting jewfish at the fish market, Punta Gorda, Toledo, Belize

Most household respondents and members of their family from the PHMR coastal communities eat seafood, purchase it 1-2 times per week, consume it more than twice a week, and find seafood prices affordable compared to their overall food budget. However, 73% of respondents say seafood prices have increased in the past five years, with 40% saying that snapper has increased in price the most. A string of snappers – usually five small to medium sized fish on a "string" – costs about BZ$5 (US$2.50). (Figure 10) Five years ago, the same string of fish cost around BZ$3 (US$1.50), or BZ$1 (US$0.50) per pound. Fifty percent of respondents say there is a decrease in the overall availability of seafood at the market, and many respondents said there is less variety and selection at the market today, where most people purchase their fruits, vegetables and fish on market days. (Figure 11)

Figure 10: String of snappers at the fish market, Punta Gorda, Toledo, Belize

Figure 11: A market day in Punta Gorda, Toledo, Belize

Why are seafood prices increasing? Are there less fishers bringing in less product? Yes. It is because of higher fuel prices? Definitely. Is there greater demand for seafood because of an increase in tourists, or because there are more people living along the coasts, off the marine resources? Possibly. Are seafood prices higher today because of the marine reserve declared five years ago? The general perception seems to be that the PHMR has had no impact on the overall availability of seafood (43% of respondents), with 38% even seeing the PHMR as having had a positive impact. If coastal communities are going to continue to want seafood as a part of their diet, they are going to need to adjust for price increases for all of the aforementioned reasons. Perhaps with the predicted increase in population, demand will surge and, combined with the anticipated increase of marine products due to the protection and conservation of species in Port Honduras, prices may lower. Without relying on these factors though, households need to adjust quickly to the reality that they must supplement their income through some other means.

Today in Punta Gorda, households are crowded with children and extended family, and are often run by women (eldest daughter, mother, grandmother etc...), the de-facto head of household. Some women are active and creative at involving themselves in the community, and finding something to make and sell in order to gain a little extra to pay for food and monthly bills. There are not many jobs in any of the three communities on the PHMR; the predominant activity is domestic work (33%). In Punta Gorda however, many of the women visited for this study did not impart a desire to ever enter the workforce, unless tourism was involved. For many their education is below high school level, so there is no real curiosity or motivation, unless it involves cooking, serving, crafting, sewing or cleaning (anything related to domestic work).

Tourism is therefore an obvious alternative situation for this group; however 69% of those surveyed are not involved in tourism.

In Monkey River, the households are also run by women, and they are crowded with children, however seven women (head of households) have recently completed training and are certified land- and marine-based tour guides with the Monkey River Tour Guide Association (MRTGA), and more are in the process of completing training (Cuevas, personal communication, 2004). Before Hurricane Iris (2001), women used to make jewelry and other crafts to sell to tourists, and there was an organized women's group where they would gather and sew. Although this no longer exists it is perceived that the women, and many of the younger women who are also certified as guides, are definitely more prepared for the likely influx of tourists that will surely come to Monkey River, especially once they have 24 hour electricity, infrastructure and other tourism related necessities in place. Other means of employment will surely follow however most women have secured a place in the future growth of Monkey River. Hotels in Placencia, a hot tourist destination 15 minutes north of Monkey River by boat, regularly book Monkey River guides to send tourists on the "Monkey River Tour", a half day boat ride and jungle tour up the River, followed by lunch in the village.

Punta Negra Village is faced with a similar situation, although on a much smaller scale. Through grants and other donations (from NGO's such as TIDE and the UN/GEF Small Grants Programme), the majority of villagers have received training to be tour guides, but there is still no infrastructure (water, electricity, hotels and restaurants) in place, no equipment (boats, engines, gear etc...) and certainly not enough tourists yet to support the fundraising of any of this capital needed (Jacobs, P., personal communication, 2004). The women from Punta Negra spend the majority of their time today at their second houses, mostly located in Punta Gorda. The

Punta Negra Village Council Vice Chairwoman, for example, runs a busy household and runs her own business, buying and selling clothing, perfumes and other small goods in the City for resale to other women in Placencia, Monkey River, Punta Negra and Punta Gorda (Martin, personal communication, 2004). She described the mentality of the younger female population of today as lazy and unmotivated, not wanting to work hard, but simply finding the easy way out: to move out, have children and rely on the extended family for support. The downfall for Punta Negra Village will ultimately be the complete collapse of the social structure, beginning with the women migrating to larger towns and cities to live and raise their families.

4.2 Fishers

Agriculture is the leading industry in Belize, at about 22% of GDP, 70% of export earnings and 29% of total labor force in the late 1990s (Gillet, 2003). And while farming by the Mayan Indians (rice, beans, corn, and cacao) is also the dominate industry in southern Belize, the waters off the coast of Toledo District are some of the richest in all of Belize (http://www.southernbelize.com/econ.html). The areas south of Punta Gorda, at the mouth of the Moho, Temash and Sarstoon Rivers, are some of the best shrimping grounds, and the area that is the PHMR is where many fishers dive for lobster and conchs. The people of Punta Gorda, especially the Garifuna who settled in this part of Belize in the early 1800s, and the Creole population who settled in Monkey River and Punta Negra hundreds of years ago, are all tied to fishing, with generations upon generations of fishers still living in these communities (Jacobs, R., personal communication, 2003 and Eltringham, 2001). These were the days when lobsters had tails that weighed 2 lbs., when the sea floor was covered with conchs and landing a 600-pound Jewfish was not unusual (Martinez, A., personal communication, 2004). This was even

the case in the 1960's, not even 50 years ago. Dr. Will Heyman and Terrence Hyatt wrote in An Analysis of Commercial and Sport Fishing in the Proposed Port Honduras Marine Reserve in 1996, that "in southern Belize, many people are aware of a drastic decline in fisheries resources. No group of people are more aware of this alarming decline than the fishermen themselves" (Heyman et al., 1996). Many fishers that were surveyed for this 2004 study still talk about the decline of certain species such as lobster, conchs and jewfish. Some fishers say they stopped fishing the day they went diving and only saw one lobster and almost every single fisher surveyed is calling for a five year moratorium on the conch industry. Whole lobster production in Belize for 1999 was 831 tonnes, in 2000 it was 757 tonnes and in 2001 it was down to 590 tonnes (Carcamo, 2002).

Regardless of the lack of employment and dire economic situation the Toledo District is faced with, all of this makes it sound like the PHMR was a needed management move where the coastal and marine resources are concerned. What is important to look at today is the relationship between these fishers, the marine resources and the sea, and what has been the impact of the PHMR on these fishers, on the marine resources and on the communities that live on the PHMR. In 2002, there were over 3,000 registered fishers and over 500 processing and market workers involved in the fishing industry, with 90% taking part in the lobster and conch fisheries (Carcamo, 2002). What will happen to this area as it begins to feel the force of other pressures much more unfavorable than the establishment of a marine reserve?

The commercial fishing industry is important to the economy of Belize, representing 7.2% of GDP in 2001 and lobster contributing 1.37% of that GDP (McConney et al., 2003 and Carcamo, 2002). The fishing sector is the third foreign exchange earner, with lobster being the largest capture fishery (US$6-9 million in exports, between 1998-2001), followed by conchs

(US$2.3 million in 2001) and then shrimp (both wild and cultured) (McConney et al., 2003). Overall the marine products industry has expanded by about 25% in the last decade (Gillet, 2003).

In the 1960s, the commercial fishery evolved and expanded to include many locally owned cooperative groups (Gillet, 2003). Punta Gorda fishers diving for lobster and conch normally sell their product to the COOP in Punta Gorda, while Monkey River and Punta Negra fishers mainly sell to the NFC in the town of Independence in the Stann Creek District. The entire fishing industry in southern Belize is less commercial and more subsistence, with less fishers in the area known as the PHMR today than there were five years ago. The number of fishers in the Toledo District has dropped to about 100 from 125 in just eight years (Heyman et al., 1996 and DoF Punta Gorda, personal communication, 2004).

The total legal fishing population today in the Toledo District includes fishers from Punta Gorda, Monkey River, Punta Negra and the PHMR Cayes. This also includes fishers who are considered "legal", but apparently do not give an address in the Toledo District (DoF Punta Gorda, personal communication, 2004). These fishers live on the Belize/Guatemala border. Many of the fishers interviewed for this study are from Punta Gorda (43%) and Monkey River (15%), but many are also originally from other parts of Belize (19%), and even from Guatemala (11%). There are still many fishers originally from Punta Gorda who still live there, but they are small scale subsistence fishers today, like they were in 1996. As a one-time commercial fisher put it, "you would have to take a vow of poverty to fish [commercially] in PG [Punta Gorda]", because according to him today there are no fish, fuel is too expensive and you have to go out "really far to fish" (Martinez, A., personal communication, 2004).

Heyman noted in 1996 that fishers from Monkey River, Punta Negra and the PHMR Cayes "support their communities almost entirely through fishing", basically implying that they fish full time. Today, most all the fishers from Monkey River are also certified tour guides with the MRTGA. Almost all of them engage in sport fish guiding when they are not working (almost full time) during the open lobster and conch seasons (June 15th – February 14th and Oct. 1st – June 30th, respectively). For the purposes of this study, both commercial and sport fishing guides were targeted to determine what kind of changes are taking place within the fishing community, what role the PHMR is playing with regards to tourism and guiding, and if the goals TIDE has set out to accomplish vis-à-vis the commercial and sport fish guiding industries' impact in the PHMR are providing any value and benefit to the local communities.

According to data collected for this survey, 60% of fishers surveyed engage in commercial fishing, while 33% engage in both commercial and sport fish guiding. Like household respondents, commercial fishers are obviously seeing a need to sustain themselves otherwise and/or they see an opportunity to take advantage of a lucrative new business where they can make more money and at the same time, protect and conserve the marine resources. Thirty seven percent of all fishers surveyed have been fishing for 10-20 years, which corresponds to the greatest percent of fishers who are between the ages of 18-30, 37%. Thirty percent have lived in their communities for 10-20 years, with 26% having lived in their community for 20-30 years and 26% also for over 40 years. Therefore, all fishers surveyed for this study were familiar with the fishing grounds of southern Belize, the lobster and conch industry, and most importantly, the PHMR.

There are two "grades" of commercial fishers today: one group is very "low-tech", while the other is considerably more "high tech". Both groups of fishers own their own boats, with the

majority using Mexican-style skiffs with usually one, but occasionally two outboard engines. Through surveys and interviews, the first group was noticeably older and of Garifuna decent, tended to fish from a dory or canoe with paddles, and is more a subsistence style fisher than commercial fisher. They use drop (25%) and tow (20%) hand lines, and the occasional small net. Nets are illegal in the PHMR, therefore these are fishers who fish close to Punta Gorda, south of the PHMR boundaries, near the Moho River. One fisher still fishes everyday except Sunday and paddles nine miles round trip each day (Martinez, A., personal communication, 2004). These subsistence/commercial fishers catch snappers, jacks and grunts – and lots of bait fish. When they have enough to sell they will pull up to the docks in front of the fish market and offer up a few snappers on a string, and any other excess. Usually though, they will leave their canoes at the Wisdom Tree, away from the market, and take their catch home for friends or family.

These fishers say they have been driven out by the "new" generation of fishers, with large skiffs and powerful engines. These fishers in the true commercial sense can spend more than four days a week fishing (six is not uncommon), for more than eight hours at a time (frequently 10-12 hours). These fishers are free divers for lobster and conchs, mostly between the ages of 18-30, and are of Creole descent, originally from Monkey River and Punta Negra. One (subsistence) fisher says there is no way these more "high tech" fishers could have caught and sold enough fish in the waters off Toledo to pay for their expensive boats, engines and required fuel. Rather, he claims, they have come across large caches of drugs found around the outer Cayes in the PHMR. This is not an unlikely scenario considering the coastline of Belize is a prime drug running corridor.

Commercial fishers today are mostly targeting lobster, conchs and finfish species such as snapper and jewfish. The local population is not buying lobster (too expensive and the majority is exported) (Wade, 2002 and McConney et al., 2003). In 2001 lobster earned US$6.45 million and employed approximately 1,707 fishers in Belize (Wade, 2002). The lobster season is open access for 8 months of the year, and there are four cooperatives in Belize that buy lobster from local fishers.

Snapper and jewfish are definitely consumed locally, and it is apparent on market days when the weather has been good (dry season) and it is not the Lenten or Easter season (when many fishers sell fish to neighboring Catholic countries at a better price). Overall though, compared to five years ago, fishers say there are less snapper and jewfish (as well as lobster and conchs) today and they are also smaller in size.

Most fishers, subsistence and commercial, are fishing in the area now known as the PHMR. It is close by and has always been known for its productive areas, such as the "conch grass" area off Punta Negra. Data shows that 55% of fishers fish in the PHMR today, where only 39% fished in that same area five years ago. Five rivers empty into the PHMR, and the mouths of these rivers used to be covered by gill nets. Now these nets are illegal in the PHMR, so it would be assumed that fish populations have rebounded. According to many sport fishing guides interviewed for this study, the abundance of many recreationally important species that spawn upriver (tarpon and snook) have increased because of this very change. However, the low numbers of commercial species would have to be attributed to either an increase in fish pots, long lining (also illegal in the PHMR) or other factors undetermined at this time. Biological study and fish population surveys would be welcome in the future in order to see what the levels of snappers, jewfish and other finfish are today, versus five years ago.

The commercial fishers from the PHMR coastal communities work very hard during the season diving for lobster and conchs. Many fishers surveyed say they are concerned about the conch fishery, and that it is on the verge of collapse, if it hasn't already (all fishers surveyed reported minimal catches of conch in the 2003-2004 season and recommend a five year closure of the conch fishery). In Gillet's 2003 paper entitled, "The Fisheries of Belize" he cites two authors, Gibson in 1982 and Glaholt in 1986 who said (almost twenty years ago) that both the conch and lobster fisheries, respectively, are in danger of overexploitation (Gillet, 2003). In 1996, Heyman and Hyatt reported that "most fishermen agree that conch are nearly commercially extinct due to overfishing by illegal aliens who take out of season and undersize conch, and smuggle them out of Belize" (Heyman et al., 1996). Lobster is still somewhat abundant, with fishers in Monkey River selling to the NFC every day of the week, however gone are the days of a BZ$25,000 profit (from lobster) in one season. Fishers surveyed in 1996 reported "less lobster than five years ago", with 81% responding that "lobster...is in a state of decline" (Heyman et al., 1996).

Many fishers do sell what product they catch to a fishing cooperative (52%), but 48% do not. The Rio Grande Fishermen' Cooperative (COOP) is back in business after serious financial mismanagement issues (lending credit, not repaying debts) and scandal. When the government gave the COOP a loan, the fishers lobbied for an ice machine, which resulted in enormously high electricity bills, and even after all debts were paid, threw the business back in the red. This COOP was not productive enough and just couldn't compete with the larger ones, like Northern, Caribena, National and Placencia (with combined assets in 2003 of BZ$20.1 million), so many fishers left for NFC in Independence (McConney et al., 2003). Today, the COOP is currently

trying to rebuild itself and as the current Chairman, Victor Jacobs, explained they are trying to institute a system whereby the fishers buy into the COOP, using a share system.

The COOP was recently given a grant which was used to build lobster shades, a very popular new structure that provides essential habitat for lobster to spawn (9% of commercial fishers said they used "other" forms of gear, and lobster shades was the "other" kind every time). While many fishers surveyed agreed that they are worthwhile, Jacobs says the ones they oversee are in need of repair, at great cost to the COOP. The leftover grant money is going to be used to purchase a packaging machine, which can maybe attempt to pull the COOP out of its current situation, and bring it on more equal footing with other profitable cooperatives in Belize.

Jacobs says he will have to raise the price he pays for conchs (+BZ$0.50) this coming season because product is becoming scarce and he wants to keep business coming into the COOP. If he doesn't pay that price to the fishers, someone else will he says. He sees the potential for a good, profitable business (he is not taking any salary today) and is committed to make the COOP work. Some cooperatives boast contracts with the Red Lobster chain of restaurants in the United States (at US$29 per kilogram on the international markets), and although that situation would probably never develop in southern Belize, the demand will hopefully keep the price for lobster competitive and the market active (Carcamo, 2002).

People fishing out of season and taking undersized lobster and conchs, usually illegal fishers from neighboring Guatemala and Honduras, is what is causing the most serious problem today with regards to overfishing. These fishers, who have access to cheaper fuel, enter and fish Belizean waters only to return to their country to legally sell undersized marine products. One commercial fisher from Monkey River said that the overfishing problem is caused by the amount of illegal fishers – almost double the amount of fishers who work in southern Belize – who come

into Belize to fish year round; he says there are not enough fishers in Belize to overfish and Belizeans respect the closed lobster and conch seasons which allows the species time to reproduce.

While people like Jacobs see the benefits and support the PHMR today, he contends that he was skeptical at first. A descendent from a long line of commercial fishermen from Punta Negra, Jacobs (and many others) used to bring in BZ$300-400 each night using nets (Jacobs, V., personal communication, 2004). Almost every fisher surveyed for this study used to use gill nets, although many were also quick to respond that they were happy giving them up. In 1996 a ban on nets, cited as the major cause of depletion, was supported by 86% of the fishermen surveyed (Heyman et al., 1996). Gill nets will be further discussed later in this report. Jacobs says that even though he saw the benefits of giving up the nets (since they are so incredibly harmful and destructive to the marine environment) there were not many tourists in 2000, so it was first difficult at first to see the perceived benefits of the PHMR. Today he is not only the Chairman of the COOP, but a successful tour and sport fishing guide who made a sizeable profit last year (after all costs) from guiding alone (Jacobs, V., personal communication, 2004).

Overall, there is a very different perception between the older and younger generations regarding the PHMR, especially when it comes to rules and regulations. It was apparent that many older fishers surveyed are less supportive of the PHMR because of the net ban, being asked to conserve while illegal fishers are poaching their waters and their lack of involvement in the new tourism, guiding and sport fishing industries. Some realize there might be benefits, but certainly not in their lifetime. The younger generation of fishers sees the benefits and the positive draw for the tourism industry, however they want the benefits, and the jobs, immediately.

Many fishers are turning to sport fish guiding due to the increase in tourists in the past five years. Ninety percent of sport fishing guides surveyed said there are more tourists today compared to five years ago. While tour guiding has been prevalent throughout Belize for many years, guiding sport fishers has just recently become popular in southern Belize. (Figure 12) Of the total fishers Heyman surveyed in 1996 (79 - although his study included fishers from Placencia), two were sport fishing guides from Punta Gorda, and 92% "expressed a desire to do more [sport fish guiding] in the future" (Heyman et al., 1996). Today, 33% of fishers surveyed engage in both commercial and sport fish guiding, while 7% are committed only to guiding. One hundred percent of sport fishing guides surveyed act as the lead guide on their boat, with 60% guiding for 0-5 years, 20% for 6-10 years and 20% for 11-15 years. Only 20% of all fishers surveyed work full time as sport fishing guides.

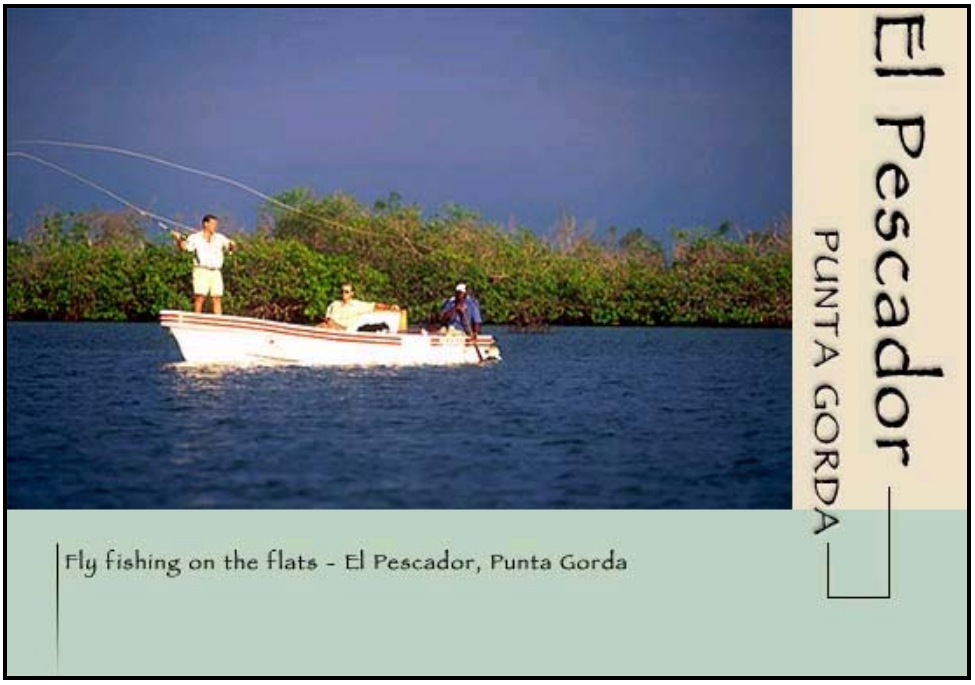


Figure 12: Fly fishing with El Pescador Lodge, Punta Gorda, Toledo, Belize

The Cayes in the PHMR are ideal for fly fishing, as is the Punta Ycacos lagoon near Punta Negra. The pristine Snake Cayes – located 20 miles offshore at the very eastern edge of the PHMR – are very popular with snorkelers and other tourists, and fishing with spinning or trolling rods are also marketed as day trips from Punta Gorda. Forty two percent of sport fishing guides surveyed engage in fly fishing, which usually requires a good, sturdy, medium-sized skiff with a powerful outboard engine (to move around from flat to flat more quickly) and expensive fly fishing gear and flies with which to practice. Guides are required to be licensed by the Belize Tourism Board (BTB), by undergoing a training course that can last from a few days or weeks to a few months, and are recommended to join their local Tour Guide Association. Seventy percent of sport fishing guides surveyed belong to a Tour Guide Association, with the most popular being the Toledo (Punta Gorda) Tour Guide Association (62%). All of this training is expensive, however sport fishing guides charge on average BZ$450 (US$225) per fly fishing day trip.

The economic benefits notwithstanding, sport fishing is a catch-and-release sport, and with high end fishing resorts, such as the newly opened El Pescador PG (PG = Punta Gorda) which charges US$180 per night in high season (Nov. 1st - June 15th), guides are being encouraged and more jobs are being created (Scott, personal communication, 2003). As Heyman wrote in his 1996 study, the value of the sport fishing industry (of one client) is much higher than the value of a bonefish, permit, tarpon or snook sold – all highly prized sport fishing species – on the market (Heyman et al., 1996). Today, while there is a country-wide ban on the sale of bonefish, fifty nine percent of all fishers surveyed would support a ban on the sale of tarpon (22% had no opinion), and 63% would support a ban on the sale of permit (again, 22% had no opinion).

While many fishers are skeptical about the PHMR for various reasons, many say they want more tourists. During Heyman's survey 91% of fishers surveyed said they believed more tourists would come if the PHMR was established (Heyman et al., 1996). Fishers are obviously seeing the benefits of sport fish guiding, while also being sensitive to the marine environment. A top fly fishing guide in Punta Gorda who only fishes in the PHMR makes about BZ$60,000-70,000 before expenses every year. Expressing a desire to guide full time was evident, however a lot of guides said there has been enough training provided from the various tour guide associations and NGOs. Another top fly fishing guide who has been fishing and guiding since the PHMR was declared says there are enough (sport fishing) guides trained today. Instead of training more guides, he suggests improving on the current situation and spending any additional training dollars on marketing and public relations, in order to get the tourists to come to southern Belize. Many guides, he says, do not even have the capital to buy boats and gear, so the majority of the training is going to waste. This same sport fish guide says that if there isn't a limit put on the amount of boats and guides allowed into the PHMR today, there will definitely be an overfishing problem in the PHMR – caused primarily by recreational fishers. Other fishers – both commercial and sport fishing guides – supported this claim.

Sport fishing guides in coastal communities who were surveyed were asked how they would like to see tourism further developed in the PHMR. Twenty two percent suggest more tourism infrastructure and another 22% suggest more tour guide training. It is clear here that those sport fishing guides who want more training are those that are not yet reaping the full, profitable benefits that other guides are. It was observed during this study that a few sport fishing guides are the ones benefiting the most, however these guides are also strong supporters of the PHMR, tourism and sustainable development in the area. They work very hard and many

are also actively involved with local NGOs and other conservation groups to help monitor and study fish populations, be on the lookout for damaging gill nets that have been left out to drift in the mangroves and help patrol the PHMR and call in illegal fishers. They are also very active in their communities and try very hard to rally energies and opinions about marine conservation and alternative livelihoods.

Can guiding continue to be successful and profitable as an alternative opportunity for commercial fishers and other members of the community? As more and more fishers find it difficult to make a living off of commercial fishing, or don't want to contribute to the overfishing situation, or see that their children are going to have a hard time entering this industry in the current market, many coastal community members from Punta Gorda, Monkey River and Punta Negra are beginning to see that sport fishing and regular guiding is one of many alternative, sustainable endeavors they can engage in to earn a living, while contributing to the conservation and development of southern Belize.

4.3 Port Honduras Marine Reserve

The PHMR was declared in part to protect the physical and biological resources of Port Honduras; to provide education and research; to preserve the value of the area for fisheries and other important genetic resources; to develop recreational and tourism services that will enhance the economic and social benefits of the area without causing environmental damage; and to strive for sustainable financing (PHMR Annual Report, 2003). These goals were also laid out by TIDE as co-managers of the PHMR in their Management Plan in 1999.

Marine reserves over the past decade have been shown to provide protection from overfishing pressures in three major areas: first, they protect, limit or control individual

commercial and recreational species from harvest inside reserve boundaries; second, they reduce habitat damage by restricting certain fishing practices; and third, they protect the entire ecosystem from overfishing, in which the removal of certain key species can disrupt an entire system with regards to its biological diversity (Palumbi, 2002). These situations have allowed marine reserves to become an important tool for marine conservation managers, however while there may always be strong support with regards to the biological integrity of the proposed or existing area, many times the social and economic impact of the marine reserve on the communities is disregarded or neglected altogether. This situation is especially difficult when the area abuts a coastal area populated with subsistence, commercial and recreational fishing industries and other activities such as tourism, boating, drug smuggling etc...

Marine reserves have non-fishery related benefits as well, such as overall biodiversity conservation, user conflict reduction and the encouragement of area closures that are free from any disturbances and allow for the study of natural processes (Bohnsack, 1993). Marine reserves may also provide a foundation for the progress of alternative and sustainable activity development. While marine reserves and protected areas should protect and maintain marine biodiversity, they should at the same time strive to manage the area as effectively as possible by including a way to relieve the initial pressures imposed on the resource by introducing alternatives and engaging the local communities to change their behavior, gain ownership and feel a sense of pride towards conserving their resources.

Since the PHMR was established, over 150 fishers have been trained as sport fishing guides (Maheia, personal communication, 2004). The vast majority of them are thrilled with their job, and hope to guide more in the future. Although many of the fishers surveyed expressed the desire to guide full time, many also said they would continue to dive for lobster, because

when it is a good year, there are good profits to be made (Cuevas, personal communication, 2004). Some fishers can still harvest 1,300 to 1,800 lbs. of lobster a season, at approximately BZ$17 (US$8.50) per pound.

As previously mentioned, both the lobster and conch catch have dipped significantly in the last half decade or more according to everyone surveyed in 1996 for Heyman and Hyatt's study, and again today for this study. The guiding industry is obviously growing and the guides themselves are profiting. In Heyman and Hyatt, it was observed that, "fishermen in Port Honduras are shifting from traditional dories (wood dugouts) to fiberglass (Mexican style) skiffs" (Heyman et al., 1996). It is pointed out that this shift might have been a result of increasing wealth, increasing lobster prices, personal choice etc. It could also be this new form of added income gained from guiding, that has maybe even helped fishers get a small loan for a boat and an engine. NGOs such as TIDE have also offered free training to those fishers who want to start sport fish guiding in the PHMR as an incentive to ease fishing pressure in the reserve. In Monkey River and Punta Negra, fishers also probably had access to grants that were handed out for compensation after the Hurricane, but also to get people involved in more sustainable activities. Today, 78% of fishers surveyed own fiberglass skiffs, 33% fish commercially and as sport fishing guides, and all fishers in Monkey River are also certified tour guides.

In a 2002 FAO report on the lobster fishery in Belize, Ramon A. Carcamo Jr. writes, "Even though the lobster fishery is the most important marine artisanal fishery in Belize, support and political will has gradually degraded placing the fishery to be managed inefficiently and weakening the very few existing management tools" (Carcamo, 2002). The Government of Belize has not been successful in the sustainable management of fisheries and other marine

resources (Gillet, 2003). In Belize, a conservation minded country, there are 94 official statutory acts relating to marine conservation, involving 18 permitting agencies and 10 different ministries (Gillet, 2003). Despite all this legislation, management is ineffective for the most part, not participatory and certainly not sustainable (Gillet, 2003). While Belize relies heavily on fishing for subsistence and as a primary income for its population, marine tourism is rapidly growing too and will contribute to the already existing stress on the marine resources. What role can marine reserves and protected areas play in Belize to ensure sustainable populations of marine products and the development of sustainable alternatives for commercial fishers and other people inflicting pressure on the sea and its resources?

The PHMR is gaining attention as a prime fly fishing spot, and anglers from as far away from Japan are coming to the PHMR to fish (Scott, personal communication, 2004). There is a new lodge catering to the high end sport of fly fishing, and more and more guides are benefiting financially from this new activity. In the Port Honduras Marine Reserve Annual Report 2003, the average number of fly fishing boats in the PHMR increased this year from four to six boats per day in the high season, and the total number of visitors to Abalone Caye – the PHMR Ranger Station - was 750 (PHMR Annual Report, 2003). Punta Gorda is opening up to the rest of Belize, and the rest of the world, as a premier eco-tourism destination with everything from hiking in the Maya Mountains to swimming at remote waterfalls in the lush jungle, to snorkeling at the Sapodilla Cayes (a World Heritage Site located on the second largest barrier reef in the world) - all of this generating more opportunities for guides and tourism outfits. The PHMR will eventually get its share of traffic, and possibly, hopefully see financial gain and benefit for its caretakers and the local community.

Today it is realized that the establishment of the PHMR has lead to the almost complete stop of the slaughtering of manatees, one of the main reasons the PHMR was created in the first place (Maheia, personal communication, 2003). According to 45% of respondents and 52% of all fishers surveyed in surrounding coastal communities, the coastal and marine environment of the PHMR is healthy. Since the PHMR was declared, 43% of respondents and 70% of fishers affirmed that the coastal and marine resources of the PHMR are being somewhat protected, with almost everyone saying there is always room for improvement. And, the majority of household respondents (71%) and fishers (81%) say the PHMR marine environment is highly important to them, and should remain that way for future generations to enjoy.

When household respondents, commercial and sport fishing guides were asked (informally) if they felt the PHMR has had any effect on them, their day-to-day livelihoods, as well as their efforts to develop and grow as a community, they answered for the most part that the PHMR is not really having any effect on them at all. Most people did not have any opinion about the establishment of the PHMR (55%) and most fishers either didn't have an opinion (29%) or were somewhat in favor (29%). With regards to their livelihood, 37% of respondents said the PHMR is somewhat related and 32% had no opinion.

Many households surveyed in Punta Gorda were not familiar with the PHMR, and were adamant about the fact the PHMR really has no direct effect on their daily lives or livelihoods. The only connection that was occasionally attributed to the PHMR (but also considered indirect) was through the seafood bought at the market that comes from the sea (and therefore sometimes the PHMR), so the health and cleanliness of the marine environment ends up being relative and important to respondents. The main concerns for the majority of the households in Punta Gorda is the lack of employment, the lack of options and choices for the younger generations and the

recent rise in crime, theft and vandalism. Some respondents were under the impression that the people of Punta Gorda were not allowed in the PHMR, which they found unfair. And most household respondents replied it is the fishers who are feeling the most effects from the establishment of the PHMR, because of closed areas, being told not to use their nets and most of all being told to "save it, while someone else is eating it" (Martin, personal communication, 2004). It is true that the establishment of marine reserves throughout Belize has caused a lot of discontent among the fishers, especially the lobster fishers, however it is realized that there is also a lack of knowledge surrounding the concept of marine reserves (Carcamo, 2002).

While it is obvious that there has been some misconstrued information conveyed throughout the PHMR coastal communities that need to be revisited in order to put a stop to the inaccuracies and general feelings of negativity and lack of support, there is an even greater need to improve the kind of information and how it is being dispersed. In the 2002 Belize Census Report, 4,494 people from the Toledo District were asked where they get their environmental information and news from, and while almost half (2,036) get this information from newspaper, television or radio, a good portion (909) say relatives or friends (CSO, 2002). Newspapers are greatly prejudiced in Belize, each enjoying their own bias and slant, and it is well known that information gets easily lost and distorted when it is passed along from person to person.

4.4 TIDE

TIDE was founded in 1997 to meet the growing environmental and development needs of the Toledo District in southern Belize. The organization was established to respond to the negative environmental effects felt from poaching, farming, illegal fishing and logging (TIDE, 2004). Based in Hopeville, just outside of Punta Gorda, TIDE has pledged "to promote the

sustainable development of the Toledo District by fostering the efficient and effective management of its natural resources, conducting relevant research and by providing training and advocacy in order to preserve our natural heritage for present and future generations" (TIDE, PHMR Annual Report 2003).

As co-managers of the PHMR, and involved in supervising the area even before it was officially declared a marine reserve in 2000, TIDE has been responsible for safeguarding and maintaining the coastal and marine resources by enforcing the rules and regulations of the PHMR, and providing environmental education to the surrounding coastal communities. The PHMR, at 160 square miles, is essentially an enormous body of water sprinkled with hundreds of low-lying mangrove cayes. Today, TIDE's strength and perseverance has emerged out of almost a decade of conservation work in the Toledo District, and while they have had great success reducing manatee poaching in Port Honduras and launching programs such as a community summer camp, there still exists a sense of animosity and misconception within the Toledo District regarding their work and position within the community.

In 1994 a series of Rapid Ecological Assessments (REA) were organized to determine the biological significance and the current threats posed to the Port Honduras area. A team from the former BCES, and community members from Punta Gorda, Monkey River and Punta Negra identified key areas of concern: endangered populations of the West Indian manatee, the American saltwater crocodile and the Morelet's crocodile; dangerously low populations of (what were then) important commercial species such as bonefish, jack, snook and tarpon; and an overall threat to the entire marine habitat, especially critical juvenile fish habitat provided by the hundreds of mangrove islands out in Port Honduras (Maheia, personal communication, 2004). In the next few years, even as the BCES collapsed in 1996 due to mismanagement, work began to

bring to light the importance of preserving and conserving the Port Honduras marine environment. Wil Maheia, a native of Punta Gorda who received an MSc in Natural Resources, Recreation, and Tourism in the U.S but returned to Belize to give back to his community, began consulting with TNC and organized a lobbying effort to end unsustainable fishing practices in Port Honduras.

In 1997 Maheia formed TIDE, and subsequently received their first grant from TNC and USAID to continue urging the government of Belize to declare Port Honduras a marine reserve. TIDE was aware that they would not receive the support of everyone in the community, but were determined to get the majority of people on their side. In 1997, during the consultation phase of declaring Port Honduras a marine reserve, informal meetings were held on a weekly basis, and at least six formal meetings were held within each community that lived off, and fished and hunted in, Port Honduras (Maheia, personal communication, 2004). Since the most destructive, yet lucrative, fishing habit was the use of gill nets, and TIDE was seeking to end the use of all gill nets in the marine reserve, many fishers were opposed to TIDE's efforts (Maheia, personal communication, 2004). Other concerns were what areas would be left open to fishing, or not, and what would be TIDE's approach to the illegal fishing problem. At this point, the DoF was only conducting random patrols in an area that had at least 100 Guatemalans illegally camping and fishing in Belizean waters (Maheia, personal communication, 2004).

In 1998, TIDE consulted the fishers from Punta Gorda, Monkey River and Punta Negra and asked them what they wanted. The fishers replied that their counterparts in Placencia were getting involved in guiding, fly fishing in particular. TIDE, with help from TNC, had a U.S. outfitter for outdoor sports enthusiasts and a leader in fly fishing gear and instruction – Orvis –

come to Punta Gorda, donate several thousand dollars worth of gear and train about 20 commercial (net) fishers how to fly fish (Maheia, personal communication, 2004).

In 2000, TIDE and the government of Belize signed an M.O.U. that placed TIDE and the DoF in charge of the PHMR. It is essentially an open ended agreement, if TIDE or the Government wants to give up responsibility of the PHMR, one party has to give the other six months notice and vice versa (Maheia, personal communication, 2004). TIDE hired Rangers (former commercial fishers who saw the harm gill nets were causing to the marine environment) and went to work educating the local communities about conservation. While many fishers agreed to stop using their nets, others said they paid BZ$5,000 for new nets and they would not stop using them. TIDE launched the Gill Net Exchange Program in 2000, which allowed commercial fishers to exchange their gill nets for compensation, on the condition that they invested that money in sustainable fishing gear (fishing lines, fish traps, ice boxes and upgrades to their boats, such as installing a hold to put fish on ice). When other fishers would still not hand in their nets because they were afraid of loosing out on good money that could put their children through school, TIDE launched the Scholarship Program in 2001. Through a grant, TIDE offered fishers (and hunters) the opportunity to trade in their gill nets in exchange for tuition for a child to attend high school (Maheia, personal communication, 2004). Today there are 12 students from Toledo District attending high school in Punta Gorda. Considering that many of these students' parents are uneducated, TIDE is hoping that not only will this program bring about a new commitment to education within each family and community, but that these students and other children eventually get involved in conservation and sustainable development in Belize.

Another program TIDE has initiated has been a summer camp for youths in the Toledo District. The program, which began in its first year with 25 students and last year enrolled a record 100 students, offers swimming lessons and environmental education (Maheia, personal communication, 2004). TIDE also strives to keep an ongoing education program active within the communities, in order to educate children about all the different systems present in their environment: mangrove swamps, sea grass beds, fresh water and coral reef systems (TIDE, 2004). The goal is to get students out of their classrooms and into these terrestrial and marine habitats to increase their understanding and awareness of their surroundings.

TIDE was also the first organization in the Toledo District to purchase a four-stroke engine. More expensive than the two-stroke kind, four-stroke engines are clean burning and fuel efficient, and much kinder to the marine environment. Today, of the 30 engines recorded in use by fishers surveyed for this study, 14 are four-stroke engines.

Approximately 175 tourist guides, land-based and marine, have been trained throughout Toledo District since the establishment of the PHMR in 2000 (Maheia, personal communication, 2004). TIDE offers some form of training – fly fishing, kayaking, snorkeling or diving – at no cost every year to people wanting to get involved in ecotourism and guiding in southern Belize. TIDE also employs about 20 people, mostly from Punta Gorda and the surrounding communities of Monkey River and Punta Negra to work in their Punta Gorda-based offices, as Rangers on Abalone Caye patrolling the PHMR or in the Paynes Creek National Park (another protected area co-managed by TIDE and the Department of Forestry) and as tour guides for TIDE Tours. TIDE Tours, a subsidiary of TIDE was established in 1999 to promote ecotourism in the Toledo District. The organization is committed to offering alternative livelihoods and sustainable ways for local people to continue to live in their communities and conserve their resources. TIDE

Tours' primary purpose is to help reduce poverty in the Toledo District by introducing more profitable economic opportunities, and generate funding for TIDE's conservation work in southern Belize (TIDE Tours, 2004).

As mentioned previously, TIDE's work has not gone without heavy criticism and even outright anger on the part of some community members. Many people feel that TIDE has not been very forthcoming with the community regarding their activities in the PHMR. Household respondents for the most part (many who were not familiar with the PHMR) had all heard of TIDE but were usually just unsure about what they do. Eighty percent of respondents said that TIDE should continue to have management responsibilities in the PHMR, and 49% said they are doing a "good" job. Despite these positive results, many respondents offered additional comments like, "people are being used by TIDE", "TIDE needs to clean up their act/reputation", "TIDE needs to be more community-based/more in touch with the community" and "TIDE doesn't have the interest of the people". Overall, respondents feel like TIDE is getting lots of money from the international community, and they are not sharing it with the rest of the people: "they" have jobs, "they" drive expensive 4x4 trucks and "they" are doing some kind of work out there in the sea. It is obvious that there is a lack of understanding about what TIDE is actually doing in the PHMR, but at the same time, there seems to be a lack of outreach on the part of TIDE.

Other household respondents also commented that "patrolling is good", "TIDE is doing a good job in certain areas", "TIDE should continue managing, as long as they continue to work with [Department of] fisheries...they should always have someone on the PHMR" and "TIDE's summer camps/trips are great". And many took the opportunity to offer suggestions, instead of just criticism and praise, about the situation at large: "need to educate children now in school

about the importance of marine products in the sea", "need to involve people in the dialogue more", "poverty is the biggest problem" and "there is a major lack of cooperation within the community...need to improve community relations". The majority of respondent's issues ranged from the lack of a positive community fabric and the level of poverty that exists in Toledo.

Fishers who were surveyed about TIDE responded similarly. Eighty nine percent said that TIDE should continue to manage the PHMR, and 52% said they are doing a "good" job. Comments also ranged from positive to negative: "inside politics [at TIDE] is one of the major problems", "only some people profit from the PHMR", "need better management in the PHMR...outreach and community involvement on TIDE's behalf is poor" and "TIDE is becoming like the government, too powerful and protective of its own interests, when it's supposed to exist on behalf of the people". On the flip side, positive comments ranged from, "TIDE seems to be doing a good job and taking good care of the PHMR", "TIDE is doing a very good job (but there is room for improvement)" and "the environment and the PHMR has been the best improvement in the past five years". Overall fisher's complaints were focused on illegal fishing and the lack of resources available to combat the Guatemalans and the setting of gill nets.

There is an average of five PHMR Rangers on staff full time, all former commercial fishers from nearby villages. Many still fish and dive for lobster commercially, however all have changed their fishing habitats and each one spends their days patrolling the PHMR, enforcing the rules and educating people and children in nearby communities. The PHMR is broken down into five zones: the General Use Zone, the Conservation I and Conservation II Zones, the Preservation Zone and the Special Management Area (PHMR Management Plan, 1999). The Rangers, located on Abalone Caye, are in charge of manning the Ranger Station, greeting visitors and educating guests, and patrolling the area and different zones to monitor activities

such as gill net use, illegal fishing and over fishing (PHMR Annual Report, 2003). (Figure 13) There are also approximately 20 sport fishing guides out in the PHMR at any time helping with surveillance and patrolling (Garbutt, personal communication, 2004).

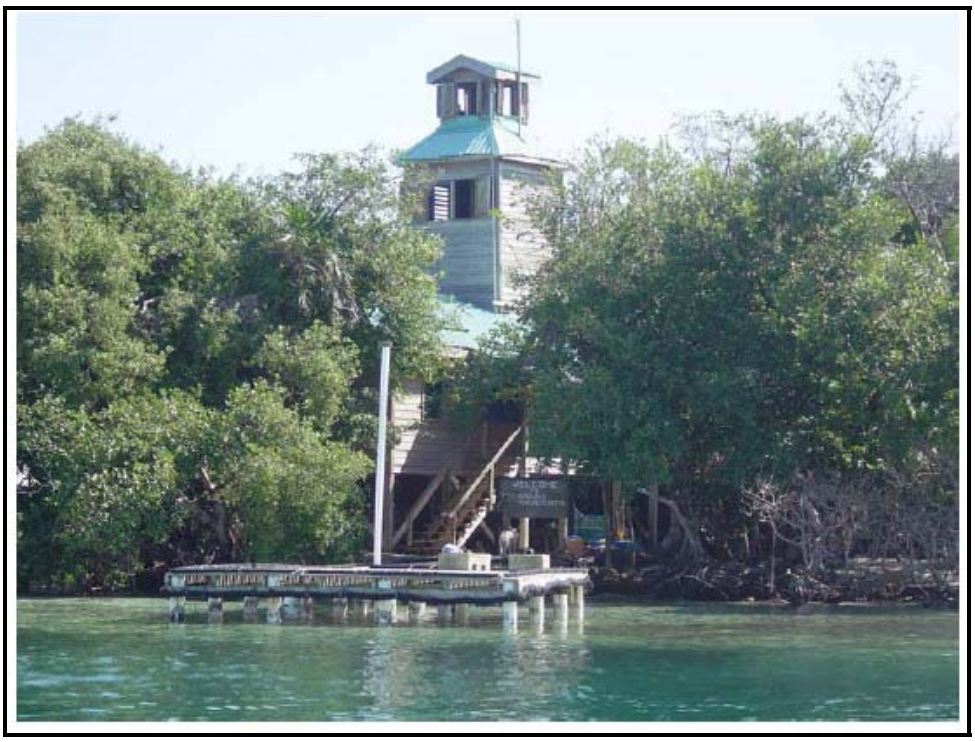


Figure 13: PHMR Ranger Station on Abalone Caye in the PHMR, Toledo, Belize

It is difficult to ensure that there are absolutely no illegal activities such as squatting, fishing and netting occurring in the PHMR. Manpower is still limited, and fuel – at over BZ$8 (>US$4) per gallon – is not handed out gratis (or even duty-free to NGOs and others involved in patrolling and enforcement). Today there are considerably less gill nets and illegal fishing activities in the PHMR than before, even though 85% of fishers surveyed for this study say they have witnessed illegal fishing in the PHMR. An interview with the Manager of the PHMR, Dennis Garbutt (a former commercial fisher from Punta Negra Village) revealed that there are still "hot" areas, like river mouths and the Preservation Zone near the Snake Cayes, and certain times of the year, like right before lobster season opens, Lent, Easter, and Christmas when illegal

fishing activities tend to peak (Garbutt, Dennis, personal communication, 2004). While he has tremendous confidence in his Rangers, he contends that they need more training, and possibly need to be armed.

Recent incidents that have arisen with illegal Guatemalan fishers suggest that for their own safety, it might be wise for Rangers to patrol with guns. Wil Maheia, Executive Director of TIDE, has called on the PHMR Advisory Board (comprised of local community members, fisher and tour guide associations, government and non-government members) for their opinion regarding this situation. TIDE has had a boat and engine stolen, and members of their staff have been directly threatened by Guatemalan fishers who have crossed into the PHMR to fish illegally and set nets. While the Rangers are equipped with radios, who check in with the Station, other fishers (guides) out on the PHMR, and even with the El Pescador Lodge (who maintains a radio) while out patrolling, this is still not enough to protect them from their counterparts who have a history of settling their disputes differently than the Belizeans (Maheia and Scott, personal communication, 2004). Very recent communication with TIDE has confirmed that the threats are due to missing caches of drugs, rather than past encounters and arrests between Rangers and illegal fishers in the PHMR (Maheia, personal communication, 2004). The investigation into the is matter is still ongoing.

The Port Honduras Marine Reserve Annual Report 2003 states, "In 2003, a total of 3,120 gallons of fuel were consumed in order to carry out patrols. Overall, this led to the confiscation of 15 gill nets and the arrest of 10 individuals in 4 different vessels, of which one vessel was confiscated by the Courts" (PHMR Annual Report, 2003). An interview with Rudy Arzu, Supervisor of the DoF, Punta Gorda office, proclaimed his satisfaction with his Department's participation in the PHMR and its management, and that there is definitely a "level of

cooperation" between the government agency and the NGO (Arzu, personal communication, 2004). When asked about surveillance and patrolling in the PHMR, Arzu responded immediately that "fuel constraints make it hard to get patrols done". Two years ago, this Department had a fuel allowance of 500 gallons per month; today this has been reduced to 100 gallons per month, which is also slotted to cover the vehicle used to tow the patrol vessel (Arzu, personal communication, 2004). The DoF in Punta Gorda is charged with patrolling the entire coastline of the Toledo District, which is conducted today in (barely) two trips. Arzu admits that in order to feel comfortable about his duties, he needs at least four patrols per week, at 500-600 gallons of fuel per week (Arzu, personal communication, 2004).

Clearly TIDE and the DoF cannot patrol the entire Toledo District coastline and be responsible for enforcing all the Belizean fishing and PHMR rules and regulations, especially with the ongoing levels of illegal fishing and other threatening activities. There are obviously financial constraints that are affecting manpower and the availability of fuel to increase patrolling. Many fishers, and even non-fishers, have brought forth allegations that the real issue stems from the issuing of licenses (and residency) to non-Belizeans on the part of government officials in exchange for votes within their districts. Therefore, in many cases Rangers and DoF officers do not even have the authority to arrest or detain many of the illegal fishers out in the PHMR, even though they do technically have the authority to arrest, because these "illegal" fishers for the most part tend to have "legal" documentation.

4.5 Illegal fishing

The DoF Annual General Meeting (AGM) Report for 2002 stated that there have been heightened enforcement activities in 2002, which lead to a 50% increase in patrols over 2001, and a total of 44 convictions and fines collected in excess of BZ$144,000 (DOF AGM, 2002). Regardless, there is still a rampant illegal fishing problem in southern Belize. Data collected for this study shows that 31% of household respondents and 28% of fishers claim illegal fishing to be a major impact or activity affecting the PHMR today (the #2 and #1 ranked responses, respectively) and 20% of household respondents and 29% of fishers said illegal fishing will be the greatest threat to the PHMR in the future (the #2 and #1 ranked responses, respectively). A web site that promotes responsible tourism, http://www.belize.com, even describes travel from Belize to Guatemala from Punta Gorda as, "risky because of the presence of poachers from Guatemala and Honduras who regularly enter Belizean waters for illegal fishing or to raid fishing traps set by Belizean fishermen" (http://www.belize.com/belize-guatemala.html). How can tourism and other sustainable activities be further developed if there is overall disrespect for the marine reserve, apparent disregard for its Rangers and law-abiding fishers of Belize, and constant belligerence and threats of violence? How can the sport fishing and guiding industry stay strong and continue to thrive if the very fish they are targeting as catch-and-release species are being caught by the hundreds in gill nets and sold off in Guatemala? Even if the communities of southern Belize, especially its fishers, decide to modify or change their behavior completely, and divert their energies to more sustainable activities, from ecotourism or guiding, or education and conservation work, they will still face the threat from Guatemalans migrating to Belize, squatting on their Cayes and poaching marine products from their waters. It is no wonder

there are still Belizeans who would rather use their nets, catch as much fish as they can at any size and sell to whoever they can, including the Guatemalans and Hondurans.

A recent series of articles by Kenneth Gale (a contributing editor and former Superior Court judge in Los Angeles) published in The Reporter, a weekly Belizean newspaper, in March 2004 titled, "Losing Paradise...Gill nets can kill off Belize's fishing industry!" and "Foreign fishermen exploit Belizean waters!", has brought this important issue to light (Gale (1), 2004 and Gale (2), 2004). The first article discussed gill netting and the damage it is causing to the sport fishing industry in Belize. Gale describes how for the past 15 years, Belize has gained a terrific reputation with regards to sport fishing and the ability to catch a "Grand Slam" (a permit, tarpon and bonefish all caught in one day) and the tremendous boost this activity has given to tourism and to the economy of Belize. Today he says the fishing is nothing like what it used to be because of gill nets, and even worse, foreigners (Guatemalans) setting these nets at the mouths of rivers where these prized sport fish spawn. These kinds of fish, while of no importance to the export market, are salted and sent back to Guatemala. "The police in Stann Creek (District) and Punta Gorda take the position that there is nothing they can do since the Guatemalans have been issued valid fishing licenses signed by a certain Punta Gorda politician" (Gale (1), 2004).

Gale says that because the Guatemalans and the Hondurans have destroyed the fishing in their own waters, they are now using Belizeans waters (Gale (1), 2004). "At present the most active gill netters are Guatemalan camped on Belize's southern Cayes. They bring 55 gallon drums of gasoline with them so they can make long stays in Belizean waters. They use trammel nets (gill nets) that are hundreds of feet long" (Gale (1), 2004). The nets are responsible for trapping all sizes of fish, from tarpon to lobster and turtles to dolphins and manatees (the

Guatemalans eat manatee, Belizeans do not) and the only recourse is to ban nets altogether throughout the country.

In a follow up article two weeks later, Gale opened the story with a "congratulations" in reference to the March 17, 2004 arrest of a Punta Gorda DoF officer who was caught issuing false licenses to foreign commercial fishers (Gale (2), 2004). When the Guatemalan fishers were questioned, they showed licenses with the name Mike Espat (Honorable Mike Espat, the Toledo East Representative). Gales's report feature pictures of Guatemalan fishers' camps out at the Cayes (one just 4 miles out from Monkey River), many boats (at least 6) with no permit numbers, and about 15 Guatemalans working out of the camp, bringing lobster in gill nets. Boats leave with marine products and return with fuel, and when asked about their legal status, they replied "[we] have licenses and permits from Belize" (Gale (2), 2004).

While the Guatemalans are raking in tons of fish with nets and undersized lobster off season, the Hondurans are diving for conch (also off season), and selling undersize product to village restaurants (it is sliced up before it is sold). Gale estimates that about 100 Guatemalan and Honduran commercial fishers with at least 40 boats fish Belizean waters every year (Gale (2), 2004). As noted previously, many of these fishers are fishing in the south, but more and more are beginning to fish further north (closer to areas like Monkey River at the northern end of the PHMR) because of the increased presence of Rangers and sport fishing guides in the south.

Ann-Marie Williams, news editor at The Reporter, responds and ads in part on April 4, 2004 in an article titled, "Fishing – last of the hunter/gatherer's spoils" (Williams, 2004). Beverly Wade, Fisheries Administrator at the DoF told Williams she agrees with Gale's article, but added "that illegal fishing is difficult for most coastal states to stop, and Belize is no exception" (Williams, 2004). According to the article, Wade offers three ways the DoF has

decided to deal with the gill net situation: 1) limit mesh size, 2) limit access and 3) restrict use. In response to a suggestion about banning gill nets altogether, Wade contends that "traditional local fishermen in Punta Negra, Placencia, Monkey River and Sarteneja Villages will not support a ban because they have been using gill nets for a long time. So we try to find ways to work with them" (Williams, 2004).

In Heyman's 1996 study, 86% of fishers surveyed in Toledo (not including Sarteneja which is located on the northernmost peninsula of Belize, in the Corozal District) said they would support a total net ban law for Port Honduras, agreeing that "the major cause for fisheries depletion includes nets..." (Heyman et al., 1996). Many fishers surveyed and interviewed for this study also declared that "gill nets and fish pots and shrimp trawlers are the greatest threat the PHMR faces". However, the setting of gill nets in the PHMR has gotten better, as many fishers interviewed have commented about more tarpon, snook, permit, mackerel and bait fish overall. Arzu, with DoF in Punta Gorda, even stated, "there are rarely any encounters because of our presence...there used to be in the area of 8-10 arrests per week, but now it's very rare, only about 1-2 per month" (Arzu, personal communication, 2004). When asked to comment about the recent arrest of one of his officers issuing licenses to Honduran fishers, under his watch, Arzu declared "no comment".

The Hon. Mike Espat said in an interview that "few people are affected by the PHMR" and when asked to respond to the March 28th article by Gale, Espat responded that he had not seen it yet (Espat, personal communication, 2004). Attempts to interview Beverly Wade at the DoF were unsuccessful.

Fishers in Monkey River have organized a meeting (that was scheduled to take place on April 22nd) to gather people from various ministries, government and non-government sectors

(Williams, 2004 and Cuevas, personal communication, 2004) to bring to the table how to attempt to resolve the illegal fishing problem in the PHMR. Many fishers, especially those from Monkey River, feel the PHMR has only attracted more illegal fishers to their front door. Their goal today is to take matters into their own hands and form The Monkey River Fishermen's Association. As one fisher put it, "people from Monkey River should have responsibility in the PHMR".

Fishers from Monkey River feels that if they can make the process of obtaining a fishing license and other pertinent documents that much more difficult, it will discourage illegal aliens from the whole process of obtaining papers and coming to fish in the PHMR. A local body would "approve" the fisher applying for the license, so they could "weed" out unsuspecting illegal aliens who today simply "buy" their Belizean residency and fisherman's license. Fishers from Monkey River believe that they could double what they are earning today, which is about BZ$200-300 per day (US$100-150) if they could combat the current illegal fishing problem.

4.6 Tourism

If any community has benefited the most so far, indirectly, from the PHMR it is Punta Gorda. Most tourists, who come to fish, snorkel, sightsee etc...arrive in Punta Gorda and use it as their base. Tourists have a small, yet varied selection of hotels to choose from, and many visitors will frequent the bars, restaurants and stores in town. All business owners/managers that were interviewed for this study said that the most noticeable change in their community in the past five years – besides the very recent (and desperately needed) paving of the streets in town - has been the advent of new businesses: hotels, restaurants, stores and tour operators. Punta Gorda is definitely more equipped today to handle tourists of any economic level, especially with the opening of El Pescador PG Lodge. There are over a dozen tour operators in southern Belize,

and the BTB recently launched an ad campaign aimed at getting Belizeans to visit the Toledo District for the Easter Holiday.

An interview with the Honorable Mike Espat, the Toledo East Area Representative, revealed plans for both a Free Zone and a deep water Port and Tourism Village (similar to the one in Belize City) in Punta Gorda that could receive large cruise ships and hundreds of tourists. While both deals would certainly create hundreds of needed jobs and other ancillary businesses and opportunities, the plans are not without controversy (Espat, personal communication, 2004). The Free Zone would mostly be served by people traveling on the new road into Guatemala, and attract thousands of people from that country, Honduras and elsewhere in Central America. Traffic, garbage and other pressures would be additional hazards contributing to an already volatile situation.

The Port would not only forever alter the coastal and marine environment, but unload hundreds, and potentially thousands, of "day-tripper" tourists who have been shown not to spend adequately or equally in port cities. The entire town of Punta Gorda would need an overhaul of huge, expensive proportions. What would happen to the commercial fishing industry that feeds the population (and the visiting tourists), and the guiding industry that employs and empowers the people, while entertaining the tourists? Is this not development in the worst sense, asking a community to all of a sudden change and commit to mass tourism? The ramifications would be felt throughout the District, and surely have an impact on the communities of Monkey River and Punta Negra.

The communities of Monkey River and Punta Negra are in the process of finding their own strengths and ways to use the PHMR to their advantage, on much smaller scales. Sport fishing guides from Monkey River have benefited a little from the PHMR through fly fishing tips

in the nearby lagoon and Cayes. Punta Negra has plans to develop their village and add tourism services, but they need to begin by cleaning their beaches, getting loans from the government (or grants) to start building the needed infrastructure and then start forming tourist and hospitality associations to get ready to handle the arrival of tourists (Jacobs, R., personal communication, 2003).

According to Ray Jacobs, the Chairman of Punta Negra Village, while many fishers are not making the kind of money they used to with gill nets (about BZ$6,000 a year), they are beginning to see the positive benefits of not using the nets. He admits they are in a transition period and in the future his community will benefit through tourism. Right now, he points out, it is tough to get started and stay motivated since the government does not encourage starting up a business and it is very difficult to get a loan (Jacobs, R., personal communication, 2003). The village council, comprised of 7 members, is relying on grants and other donations to continue training guides and would someday soon like to form a Tour Guide Association.

Monkey River has definitely tried to take matters into their own hands, and with their name on the map, it is a much simpler process. Founded in 1996 (but officially registered in 2002), the Monkey River Tour Guide Association (MRTGA) was formed by Eloy Cuevas, a top fly fishing and Monkey River tour guide, and a handful of other guides. The government declared the Monkey River Special Development Area (MRSDA) in 1993 and four trails were subsequently developed in the forest to provide access to indigenous black Howler monkeys and other species of wildlife and birds (UNDP, 2003). Tourists would stop in the village to have lunch at one of the restaurants on their way back to their hotels in Placencia. This arrangement worked well for everyone, until Monkey River took a direct hit from Hurricane Iris in Oct. 2001. A lot of the canopy and habitat for the monkeys and birds was destroyed, many buildings were

wiped out or seriously damaged altogether, and water and electricity were taken out. Most importantly the tourists stopped coming to Monkey River (Young et al., personal communication, 2003).

Today the town is mostly rebuilt and the MRTGA is up and running again. The residents of Monkey River are becoming more and more concerned with protecting their resources and biodiversity conservation in southern Belize, and combined with the increase of tourists visiting the area, projects such as the Monkey River Forest Inventory and Ecotourism Project, funded by the UNDP Small Grants Programme, are helping the community to be involved in "management and protection of the natural resources while offering an opportunity for improved livelihood through income generated from ecotourism activities" (UNDP, 2003). This project is aiming to promote implementing community-based methods by increasing the participation of local people in natural resource management (UNDP, 2003). In addition to the UNDP involvement, concerned tourists have helped the community form the Monkey River Boat Builders Association, to encourage the younger generations to stay and/or become involved in sustainable use and development of their resources (Garbutt, Sonny, personal communication, 2004). (Figure 14)

Figure 14: A boat being built by the Monkey River Boat Builders Association, Monkey River, Toledo, Belize

Stewardship is crucial, and the residents of Monkey River are definitely committed to being involved in the future of their community. MRTGA has recently made a deal with the guides from Placencia to ensure that the areas along Monkey River are only visited with a tour guide from Monkey River on board. Commercial fishers from Monkey River are becoming more interested in the prospects of tourism and are getting certified to join the MRTGA. There is a rotating system in place so that everyone has an opportunity to guide (Young et al., personal communication, 2003).

Thirty people from Monkey River have passed the challenging tour guide certification course, and a BZ$40,000 (US$20,000) grant (from UNDP) has been set up to develop a web site, purchase a satellite dish (for connection to the Internet) and market the MRTGA (Cuevas, personal communication, 2004). As previously mentioned, seven women have also been certified and once a promised donation of kayaks comes through, they will conduct kayaking and bird watching trips up the River. Other women will help with cooking and serving food at the restaurants in town.

On the last two visits to Monkey River, an average of thirty tourists per day, every day, were observed stopping in the village for lunch. The MRTGA has also negotiated to have their guides join cruise ship tour boats that are beginning to visit the area and tour Monkey River (Cuevas, personal communication, 2004). The community has had to fully depend and expand on guiding up Monkey River, because commercial fishing has definitely not been as profitable as it was in the past. Many fishers do not feel the PHMR is benefiting them directly. According to most of the fishers interviewed, many feel like the establishment of the PHMR, and persistent patrolling on behalf of the Rangers in the south, is attracting more illegal fishermen to the north (to areas like Rocky Point) near Monkey River.

What about the obvious negative impacts from too much tourism or mass tourism? Hol Chan Marine Reserve, a 17 year old world renowned Marine Park, on the Belize Barrier Reef in Ambergris Caye, Belize receives approximately 50,000 visitors per year (Carter et al., 2002). Recent reports have mentioned an overwhelming number of tourists at any one time, with many inexperienced divers coming off cruise ships, disregarding and neglecting Reserve regulations.

Would the PHMR benefit or suffer from this kind recognition? If a fee system were in place, and tour guides were charging and taking tourists out for fly fishing, snorkeling and day

trips to the Cayes, new development schemes (such as the Port or the Tourist Village) could provide financial and other opportunities to the area, but without proper consultation and consideration, there could be disastrous consequences. If the entire scheme is politically motivated, and the needs and vulnerabilities of the community are not weighed with any value other than to make more money, and continue to create more social divides within the society, than the process will not work.

It will be difficult to get the PHMR to "work" with issues such as illegal fishing, Guatemalans and Hondurans who dive for lobster and conchs off season, and the issuing of illegal fishing and licensing documents to foreigners by politicians. One cannot promote a Marine Reserve and demand a fee from tourists while there is ongoing illegal activity. Nor should there be progress and development of the kind listed above before the communities real problems, such as poverty, education and infrastructure are taken into account. These conditions should be paramount.

What kind of jobs and other options will be available for the men, women and young adults living in Punta Gorda, Monkey River and Punta Negra? Tourism is definitely an option, and it is on the rise throughout Belize, with predicted spill over to the outlying areas in southern Belize. A press release issued by the Belize Tourism Board (BTB) dated Jan. 12th, 2004 states, "Belize has been the only country within the Caribbean to experience consistent increases with respect to overall tourist arrivals since 1998...total arrivals at the PGIA [international airport] from January - December 2003 stand at a record 17.2 percent increase over last year." (BTB, 2004) Definite hindrances include a lack of infrastructure, and water and electricity in places like Monkey River and Punta Negra. The other issue here is the level of commitment, motivation and enthusiasm on behalf of the people. Many respondents say they want tourism to

come to their communities, but there are currently a limited number of people who have an understanding of tourism, and even a basic idea of how to cater to tourists. Tourists will come eventually, but the communities have to be ready to host them in every respect.

Respondents surveyed declared the coastal and marine environment of the PHMR as highly important to them (71%), and 89% say it should be there for future generations to enjoy as well. The PHMR can definitely become a primary – and potentially profitable – tourist draw. Although 43% of respondents have received information about the PHMR (the majority of the information picked up was from the weekly radio show broadcast by TIDE), a definite lack of knowledge about the PHMR was perceived when household respondents were surveyed and interviewed. However, 87% of respondents would like to receive information about the PHMR and 87% would like meetings held. Likewise, in the 2000 Population Census for Belize, when asked how the level of environmental information was distributed, 2,387 of the 4,494 total respondents surveyed in the Toledo district, almost half, said they did not receive enough information (CSO, 2000).

The communities of the PHMR are going to have to seek out and develop alternatives since commercial fishing and the business of seafood will certainly not be a sustainable, primary income generator with the existing conditions and pressures. The current political and economic climate is not helping the communities progress and create jobs, therefore if the PHMR can at least be developed as an added draw to attract tourists, perhaps Punta Gorda, Monkey River and Punta Negra can benefit from being at the forefront of ecotourism and sustainable development in southern Belize.

The case for "development" here has to be through sustainable business development, not large-scale, mass volume, foreign controlled development. Local communities will have to be

involved and thoroughly engaged in the process of sustainable tourism development (or ecotourism), because if they are not part of this income generating process, they will have less incentive to both make it work and make it profitable, while continuing to abide by the rules of the protected area, and manage the resource over the long term (Bovarnick et al., 2003). While many developing countries are becoming involved in ecotourism, such as Belize, it is also very quickly becoming the most rapidly expanding sector of the tourism industry (Honey, 1999). While ecotourism may be one solution for alternative livelihood development within the PHMR communities, it will have to be tightly followed and controlled in order to make sure the profits flow in to the people and the benefits flow back in to the communities.

5.0 CONCLUSION

There are clear social and economic tradeoffs to consider when establishing and maintaining a marine reserve, especially when it is located in a poor, underdeveloped area that is dependent on the very marine resources others are try to protect and conserve from overexploitation. People are asked to stop whatever it is they have been doing for decades, fishing, camping on the Cayes, netting, hunting etc..., for the good of conservation. Regardless of the BZ$23 million that has been spent on social investment in the Toledo District since 1996, the area still has the highest poverty rate (Belize Times, 2003). For the communities of Punta Gorda, Monkey River and Punta Negra, conservation, especially a marine reserve, is a luxury, unless there are direct social or economic benefits to be had.

The establishment of the PHMR was an intense lobbying effort on the part of TIDE and TNC, both internationally-funded NGOs, who logged a lot of time and effort towards educating and involving the people in order to get their approval and support for designation. While it is recognized that it is more difficult to establish a marine reserve along the coastline, where a direct impact to coastal communities is almost unavoidable, it is important to look at what the social and economic ramifications have been over the past years to see what the benefits have been. Is the PHMR meeting its goals? Have the people of Punta Gorda, Monkey River and Punta Negra been the recipient of any positive socioeconomic changes? Has the community accepted the PHMR and are they willing to continue supporting it?

While it is recognized that marine reserves are very significant with regards to mitigating biodiversity loss and preserving areas that are crucial to habitat regeneration, the social and economic interrelations and implications are finally being recognized as a fundamental way of helping the scientific aspect thrive in the first place. Ideally it is important to have the

biological, social and economic facets all working together to ensure a cohesive adaptive management strategy, however in many places this is difficult to achieve. Toledo District is historically underdeveloped and reeling from an influx of poor immigrants. There is low potential for income and employment generation, rapid population growth and major gaps in the social and institutional infrastructure (Kairi Consultants, no date). Combined with a bleak attitude that does not motivate change, people in Punta Gorda, Monkey River and Punta Negra might well have to turn to the PHMR for any chance at positive change, influence and social and economic return.

The PHMR is a positive achievement, and it has only been able to exist thus far with support from TIDE and TNC, and especially through the hard work of the TIDE Rangers and the DoF, who have the difficult of job of making sure people understand and obey the rules and regulations of the protected area. Whether or not there have been significant benefits to the local communities remain to be seen, however there have been some social and economic changes that are significant in the sense that they have the ability to become a foundation for more positive transformations to soon become a reality.

There have been a few of Rangers hired from the local communities, and many commercial fishers have been trained as tour guides and sport fishing guides. A new generation of commercial fishers is beginning to understand and appreciate conservation for the benefit of the marine resources (extractive and non-extractive) and for the eventuality of tourism, and subsequently great economic return. The large majority of people in these coastal communities are putting up a fight towards banning gill nets completely and cracking down on illegal fishing inside and outside of the PHMR. And almost everyone is promoting tourism, on the small and large scale. Since there are no other options being presented, this opportunity that is fast

approaching can hopefully offer benefits to everyone. The PHMR, lead only through TIDE's vigilant management, will hopefully be in a position to ensure that profit is well managed and equally distributed.

Any form of economic gain has been slow to come to Toledo not because of the PHMR, but because of the Government. The PHMR can only provide an incentive and offer alternatives to current activities are that destructive and in the long run, not worthwhile regardless of biodiversity conservation and international and local NGOs desire to step in and help. Until the Toledo District can understand and achieve the notion of real community participation and sustainable development, and foster some kind of incentive within each community and within each group (the Garifunas, the Creoles, the Mayas), the people are going to be unwilling to want to make an effort towards any kind of progress or development. Even if the Government of Belize, a foreign contractor or an NGO bridges the financial gaps, spells out the steps and offers conservation initiatives or tourism ventures, there will be no success until there is real community acceptance and involvement. And this will never happen in Toledo until people stop promising and start doing. As one respondent exclaimed "the biggest problem here is that people are always told they are 'poor', the 'last', the 'worst', so people believe it and continue to believe it now. Toledo is always 'the last district', 'the forgotten district'. This misconception has lead to a poor attitude. The mindset has to change."

TIDE, as an NGO with considerable international support, is in a position to direct the Government's policy towards how to spur this incentive and cooperation. They will not make it happen by working with a closed mentality in a closed space. Although it is difficult to make promises, or not, or be everything to everyone, there has to be a direct strategy with regards to communication and interaction with the communities of the PHMR. Many people are feeling

pushed and pulled, used and discarded for their information and support. As another respondent put it, "we need to improve on what we have before we develop more". By focusing on Monkey River and Punta Negra, much smaller and more manageable communities, TIDE can then be in a position to show results (and failures) to a larger, more "urban" population like Punta Gorda. Effort focused on the tour guides, preparing them and the PHMR for potential tourism growth in the near future, would not go unwarranted for it would be far better to be prepared for what could be a great financial boon, than to head directly into the path of a great opportunity scattered in many directions and totally unprepared.

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7.0 APPENDICES

7.1 Survey Form 1: Household Survey Form

7.2 Survey Form 2: Commercial / Sport Fishermen Survey Form

7.3 Survey Form 3: Stakeholder Interview Form

7.4 Survey Form 4: PHMR Management Effectiveness Interview Form