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National Reports

Report of Fourth Annual Scientific Meeting -
Kingstown, St. Vincent and the Grenadines
10-20 June 2008

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Belize, 2008

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Foreword

CRFM's Fourth Annual Scientific Meeting took place during 10-20 June, 2008. During this Meeting, CRFM Resource Working Groups examined data from nine fisheries: the crevalle jack (*Caranx hippos*) fishery of Trinidad and Tobago; the spiny lobster (*Panulirus argus*) fisheries of The Bahamas and Jamaica; the queen conch (*Strombus gigas*) fishery of St. Lucia; the reef and slope fisheries of the Turks and Caicos Islands and St. Kitts and Nevis; the whitemouth croaker (*Micropogonias furnieri*) fishery of Trinidad and Tobago; and the Atlantic Seabob (*Xiphopenaeus kroyeri*) fisheries of Guyana and Suriname. A plan of action was developed for strengthening the information base necessary to inform the establishment of management and conservation measures for small coastal pelagic fisheries. In addition, the Large Pelagic Working Group conducted a review of the region's fisheries in order to evaluate assessment priorities and to develop a workplan for addressing required assessments and improving collaboration with ICCAT. The Meeting reviewed and adopted the Report of the Third Meeting of the CRFM Ad Hoc Working Group on Methods. A proposal to establish a Working Group on Data, Methods and Training was considered and endorsed by the Meeting.

The Report of the Fourth Annual Scientific Meeting is published in two Volumes: Volume 1 contains the proceedings of the plenary sessions and the full reports of the CRFM Resource Working Groups for 2008. National reports, submitted for consideration by the Meeting, are published as Supplement 1 to Volume 1, while the Report of the Third Meeting of the Ad Hoc Working Group on Methods is published as Supplement 2 to Volume 1. Volume 2 contains the general reports of each Working Group and the fishery management advisory summaries for completed fishery assessments. These fishery management advisory summaries are the same as the first 7 sections (sections 1 to 1.7) of each of the fishery assessment reports that are provided in full (sections 1 to 1.8) in Volume 1.

Volume 1 is intended to serve as the primary reference for fishery assessment scientists, while Volume 2 is intended to serve as the main reference for managers and stakeholders. Sincere thanks to Mr. Greg Franklin for providing the photographs which appear on the covers of these two volumes.

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BAHAMAS NATIONAL REPORT

By: Lester Gittens
Science & Conservation Unit, Department of Marine Resources

1.0 Introduction

The Bahamas covers an area greater than 343,450 km^2. Of this, 154,553 km^2 comprise shallow waters (up to 200 m depth). The shallow water banks have an average depth around 9 m but water depth can plummet to between 370 m and 3 700 m along the edge.

In terms of landings value the most important fished resources obtained from the Bahamian Exclusive Fishery Zone include spiny lobster (*Panulirus argus*), queen conch (*Strombus gigas*), various snapper species and Nassau grouper (*Epinephelus striatus*) according to CY2007 figures (Table1; Appendix 1). The spiny lobster fishery accounted for 88% ($71 million) of landings value and 63% (5.2 million lbs) of landings weight in 2007. Approximately 98% of the spiny lobster recorded landings weight was spiny lobster tails only.

2.0 Description of the Fisheries and Fleets

The commercial fishing industry of The Bahamas is based primarily on the Little Bahama Bank and the Great Bahama Bank. Approximately 95% of fishers target spiny lobster. Spiny lobsters are also obtained from Cay Sal Bank although this is to a lesser extent than the other major banks.

Commercial fishing vessels range in size from 11 ft to 100 ft. A fisheries census conducted in 1995 showed that there were approximately 9,300 fulltime fishers and over 4,000 small boats and vessels.

Most fishing vessels take part in the commercial fishery. There is often a "mothership" that works with up to eight vessels. Some vessels stay at sea up to five weeks. Some mother ships have a freezer capacity of 40,000 lbs, however, around 20,000 pounds is the typical maximum landed by a large mothership at one time. Many of the smaller vessels and persons who fish only at the beginning of the lobster season make only 1 day trips. Virtually all landings from the fishery are lobster tails.

Fishing gears that are utilized include spears, the lobster hook, compressors, lobster traps and casitas. Of these, a license is required for compressors and lobster traps. The maximum number of traps that can be used is indicated on the permit. The traps must also be of specific dimensions (91.4 cm x 61 cm x 61 cm with slats no less than 2.54 cm apart) unless there is authorization to do otherwise. The number of casitas is unknown. However, it is known that there is widespread use. Records show that approximately 60,000 traps are in use.

Most lobsters are caught with the aid of casitas (locally known as condominiums). Casitas have increased in popularity since the late 1980s and usually consist of a sheet of zinc placed on concrete blocks or wood. It is estimated that during 1995-1997 the proportion of lobsters caught using casitas vs. other fishing gear peaked and has remained unchanged. A casita is not usually removed from the sea except to be relocated although relocation is not very common. A typical casita lasts about five years. Large scale replacement occurs following hurricanes.

When lobsters aggregate under a casita, a fisher simply lifts the sheet of zinc, uses one end of a lobster hook to catch a lobster and the other end to pierce the exoskeleton on the ventral surface of the thorax. This immobilizes the lobster. The majority of lobsters under the casita are caught before they find refuge elsewhere.

Fishing effort for lobster is not constant throughout the open season. A number of part time fishers only fish during the opening of the lobster season in August. In addition some of the fulltime fishers with very large vessels elect to only undertake only a few 4-5 week trips starting at the beginning of the lobster season and finishing with a few months left in the open season.

3.0 Data Collection and Handling

Catch and effort data are collected by interviewing fishers and by inspection of landings. However, collection of landings statistics in this manner for the entire Bahamas is constrained by having few data collectors and multiple landing sites on multiple islands.

Catch statistics are supplemented by purchase reports submitted by processing plants. Islands with major fishing communities also have processing plants that purchase a large portion of the fishery products landed on those islands. Access to these reports allows the Department to improve estimates of the total weight of fishery product landed, the total weight exported, the local value of landings, the value of exports, landings by major-island and exports by island. Purchase reports also reflect the weight of exports per year per commercial size category per processing plant for spiny lobsters and thus reflect annual cohort size classes to a limited extent. Further information on annual cohort size classes is obtained by sampling lobster tail lengths from major processing plants.

Lobster data collected from processing plants is considered largely complete because it is believed that over 90% of lobsters landed are exported and thus recorded. The year-to-year differences in recorded landings are considered reflective of actual trends in landings for lobster. The total fishing effort for lobster is unknown.

4.0 Research

Research on gear selectivity in the spiny lobster fishery is expected to begin during August 2008. The purpose of the research is to determine whether there is a difference in size of lobsters captured by casitas versus traps with a view to improving stock assessments for the fishery. During 2008 research is also expected to begin on determining the suitability of using a minimum lip thickness to protect juvenile conch verses utilizing the presence of a flared lip.

5.0 Policies and Legislation

Government policy presently reserves the commercial fishing industry, as far as is practical, for the exploitation by Bahamian Nationals. Only commercial fishing vessels that are 100% Bahamian owned are considered Bahamian and therefore allowed to fish within the country's Exclusive Economic Zone. In addition only Bahamian citizens can take part in commercial fishing unless the individual is in possession of a spousal permit or a work permit that specifically allows fishing.

Approval has also been given for five areas to be designated as marine protected areas. These marine protected areas are expected to positively impact a number of fisheries resources. Public consultations have been held and declaration of the boundaries under The Fisheries Act is expected in the near future.

The primary management objective for the spiny lobster fishery, although not official as yet, is to ensure that spiny lobsters are harvested for maximum economic benefit that this is done in a sustainable manner.

Legislation affecting fisheries includes The Fisheries Resources (Jurisdiction and Conservation) Act 1977 and the Wildlife Conservation and Trade Act 2004.

A summary of regulations from the Fisheries Act that apply to all Bahamian fisheries are seen below: -
SCUBA diving for any fisheries resource is prohibited.

Compressors can be used for commercial fishing, but only during the lobster season (August 1 to March 31). In order to use a compressor the fisherman must have a permit from the Department of Fisheries, which is issued only to trained, certified divers. Compressors are can only be used in waters between 30 ft and 60 ft.

There are also other regulations and or policies that are species specific. Regulations specific to the lobster fishery according to the Fisheries Act include:-

It is illegal to capture, possess or sell egg-bearing spiny lobster
It is illegal to remove the eggs from a spiny lobster
It is illegal to possess a spiny lobster that has had the swimmerettes removed
There is a closed season during the period April 1st through July 31st.
The minimum harvestable size for a spiny lobster is 82.55 mm carapace length or 139.7 mm tail length. The tail length regulation is only enforced when the carapace is absent.

Regulations pertaining to foreign sports fishers were changed in 2007. A maximum of 6 lobsters is allowed aboard a vessel at any one time. This has changed from 6 lobsters per person aboard a vessel.

With regards to The Fisheries Resources (Jurisdiction and Conservation) Act 1977 and the regulations made there under, enforcement is the responsibility of the Department of Marine Resources, The Royal Bahamas Defence Force, The Royal Bahamas Police Force and The Customs Department.

6.0 References

CRFM 2005. Report of the First Annual CRFM Scientific Meeting. *CRFM Fishery Report* No. **11**. 318p.

Gittens, L. and M. Braynen.2002. Report For The Second Workshop On Management Of The Caribbean Spiny Lobster Fisheries In The WECAFC Area.9p.

Gittens, L. 2006. *Panulirus argus* Tail Length-Weight Conversion for The Bahamas and Size Limit Implications. Department of Fisheries Internal report. 3p.

APPENDIX

Table 1: Weight and Value of Commercial Landings within The Bahamas

SPECIES	TOTAL	
	wts. (kg)	value ($B)
conch	375,638	3,051,282
crawfish heads	1,222	1,358
crawfish meat	7,603	165,849
crawfish tails	2,299,151	70,366,282
crawfish whole	17,814	418,715
grouper fillet	6,607	64,374
grunts	38,905	102,967
jacks	82,766	619,452
nassau grouper	156,051	1,592,827
other	28,365	114,235
other grouper	58,486	401,214
sharks	-	-
snappers	563,548	2,848,370
stone crabs	30,699	582,527
turtle (green)	-	-
turtle (loghd)	1,061	3,880
TOTAL	3,667,916	80,333,332

BELIZE NATIONAL REPORT

By: Ramon Carcamo Jr.
Belize Fisheries Department
Ministry of Agriculture & Fisheries

1.0 Introduction

The fishing industry of Belize has contributed significantly to the development of the country by providing direct employment to 2,110 fishers and over 723 processing plant personnel (123 personnel are involved in wild capture fisheries and 600 in aquaculture). In addition it has added to foreign exchange earnings thereby strengthening the country's economy. The fishing industry is divided into two main sectors, the *wild capture fisheries* and the *aquaculture sector*. The wild capture fisheries sector is predominantly a small-scale fishery, which is carried out mainly within the shallow protected waters of the main Barrier Reef (reef flat and reef slope) including the three atolls (Turneffe Atoll, Glovers Reef Atoll and Lighthouse Reef Atoll). The shrimp fishery has been classified as an industrial fishery which is generally carried out in the central and southern part of the country. However, recent challenges in the fishery have affected the fishery and production has drastically significantly.

The aquaculture sector, one of the most important sectors, presently has ten shrimp farms operating in the country. Forty six and a half percent (46.5%) of the foreign exchange earned in 2007 was from the exportation of farmed shrimp. The aquaculture sector contributes significantly to the employment and income generation of rural communities.

In 2007 approximately $19.8 million Belizean dollars, and $22.7 million Belizean dollars in foreign exchange was grossed from aquaculture (white-farmed shrimp and tilapia) and wild capture fisheries, respectively. The Belize fishing industry contributed 3.0 % to the gross domestic product (GDP) of the country (Source: Central Statistical Office).

2.0 Description of Fishery

2.1 Wild Capture Fisheries Sector

The wild capture fisheries sector is comprised of commodities such as spiny lobster, queen conch, pink shrimp, finfish, aquarium fish, aquatic invertebrates and stone crab. The spiny lobster, queen conch and pink shrimp are the most important ones with respect to production and economic value. Most small-scale commercial fishermen own their fishing vessel. Some fishermen fish for only the day while others would fish in groups for 6-12 days depending on their ice supply. Some of these fishermen construct camps on various small islands while others live or camp in their vessels.

A variety of fishing gears are used in these fisheries. Spear guns, Hawaiian slings, and wooden strips fixed with chicken wire are used for capturing scale fish. Hook sticks, drums and shades or "casitas" are used by skin-divers in the lobster fishery. Most fishermen in the northern part of the country use traps to harvest lobster. Conch is harvested by skin-diving at depths between 5 - 90 feet along the reef and atolls. Methods used by fishermen to fish for other fishery products include beach traps, gill netting, long line, trolling and spear fishing and other nets. Shrimp trawlers are equipped with otter trawls which are used to capture wild pink shrimp in the southern waters of the country.

Presently there are over 2,100 registered part-time and full-time fishermen and 593 registered fishing vessels that are involved in the fishing industry. In 2007 there were 2,110 licensed fishermen, which showed a decrease of 1.0% compared to 2006. It was also recorded that 593 vessels were licensed in 2007, which showed a decrease of 9.2% compared to 2006 (Table 1).

Table 1: Belize licenses issued to fishers and boats (1999 -2007).

TABLE OF ISSUED LICENSES									
Year	1999	2000	2001	2002	2003	2004	2005	2006	2007
Fishers	2137	1872	1707	1947	2009	1731	2026	2131	2110
Boat	728	750	608	708	689	621	652	653	593

2.2 Lobster fishery

On an average 500,000 lbs. of lobster tails are exported annually. It is a seasonal fishery, kept as "open access" for eight months of the year. Lobster tails and lobster head meat are bought from the fishermen by the five fishing cooperatives. Lobsters are caught throughout the inner reef system of the Barrier Reef using lobster pots, hook sticks and shades or "casitas". Fiberglass and wooden skiffs are used in this fishery Figure 1 and are propelled by outboard engines (25-75HP). Wooden sails boats equipped with an auxiliary engine are also used by fishermen for harvesting both lobster and conch. These boats would carry up to 8 small canoes and 10 divers (Figure 2).

Figure 1. Fiberglass skiffs used by fishers.

Figure 2. Wooden sail boats equipped with an auxiliary engine, used by fishermen for harvesting both lobster and conch.

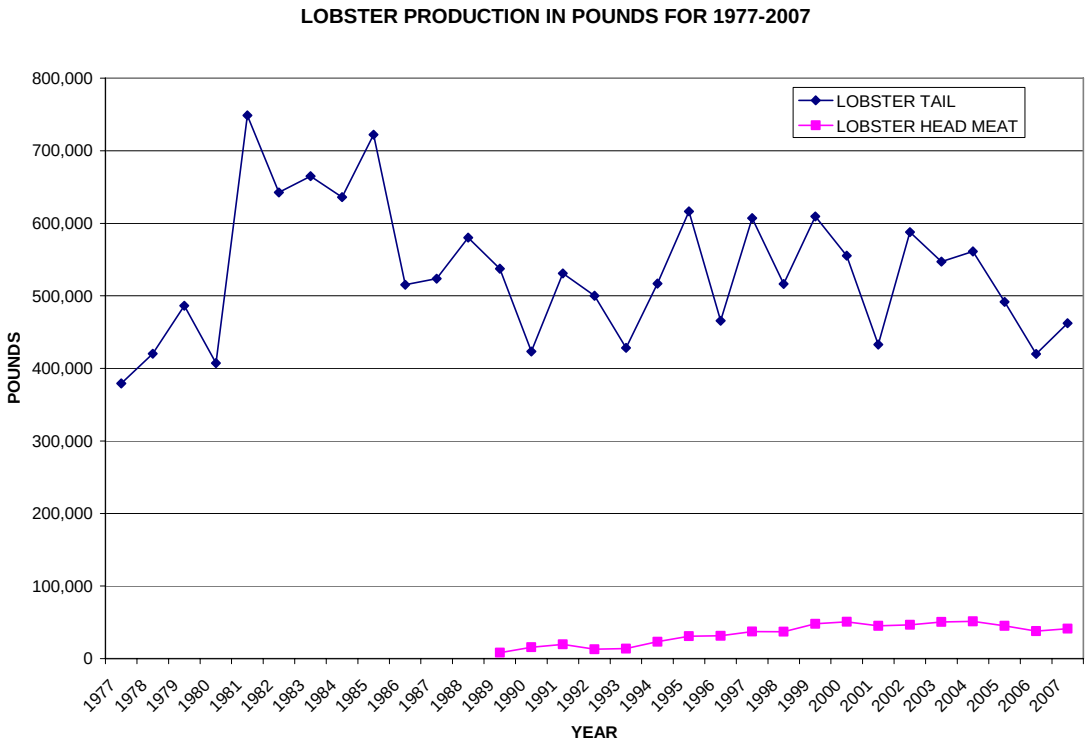


Figure 3. Belize lobster tails and head meat production (1977-2007)

2.2.1 Lobster Production

Lobsters landed at the fishing cooperatives are in the form of tails and head meat. Lobster production by the five fishermen cooperatives has remained fairly stable over the last 20 years ranging between 433,000 and 625,000 lbs with over 462,152 lbs of lobster tails and 41,294 lbs of head meat being produced in 2007. This showed an increase of 10.1 % in lobster tail and 9.1 % in head meat production compared to the year 2006. This represented 43.2 % of the total wild marine commodities produced (Figure 3).

2.2.2 Lobster Exportation

Presently there are five fishermen cooperatives operating in the country. These cooperatives are owned by Belizeans and employ about 123 persons who are responsible for processing, packaging and administrating the daily activities.

The two major fishing cooperatives, Northern and National Fishermen Cooperative, have a processing plant that processes fishery products for exportation. Caribena, Placencia and Rio Grande Fishermen Cooperatives deliver their fishery products to either one of these major fishing cooperatives. Over the past years lobster tails exports have remained fairly stable between 400,000 pounds and 600,000 pounds. In 2007 the lobster fishery earned over $17.1 million and $169.2 thousand in foreign exchange on 440,080 lbs. and 23,450 lbs. of processed lobster tails and head meat exported to the U.S.A., respectively. This showed an increase in foreign exchange earnings of 16.9% for lobster tails and 11.8 % for head meat as compared to 2006 (Figure 4).

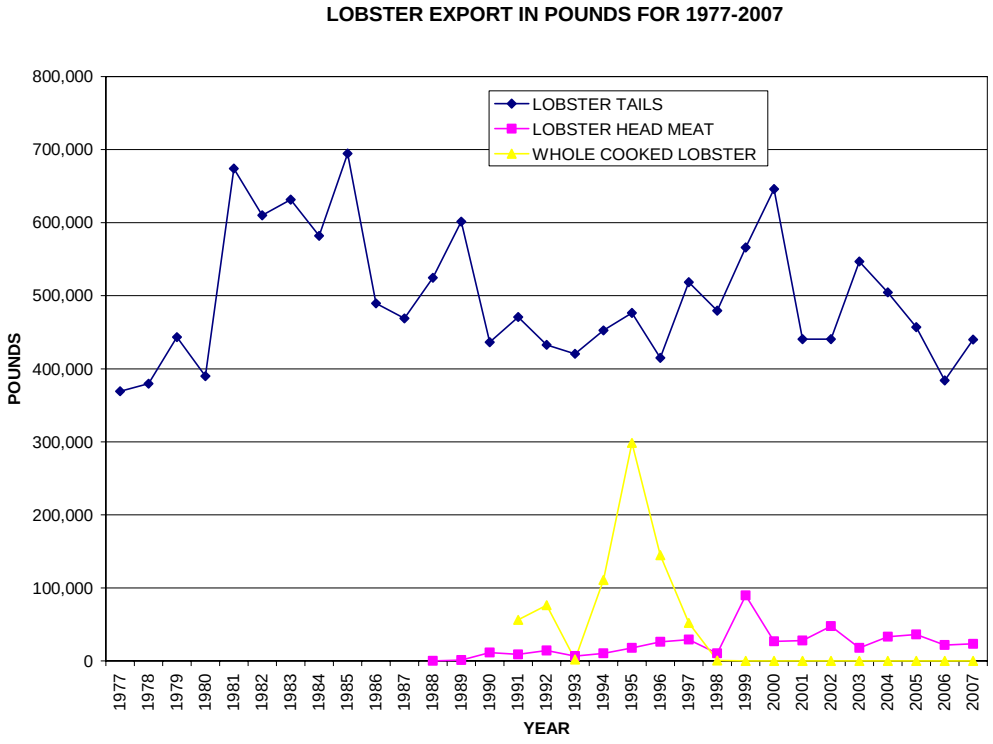


Figure 4. Lobster exports in pounds (1977-2007).

2.3 Conch fishery

Conch over the past years has remained the second most commercially important commodity harvested from the wild by divers. This fishery is an artisanal and seasonal fishery and fishing is undertaken in all six fishing areas in Belize for nine months of the year. Usually conch is caught along the fore-reef, and the inner lagoons of the atolls, and is fished exclusively by diving, because the species is sedentary. As a result the annual active fishermen exclusively dive the species at depths ranging between five feet to ninety feet. Wooden sailing sloops measuring up to 30 feet are used in the conch fishery. These are equipped with sails and auxiliary engines (15-40 HP). They carry up to 8 small canoes and as many as 10 fishermen and remain out at sea for 6 to 12 days.

2.3.1 Conch Production

Conch production by the five Fishermen Co-operatives has remained fairly stable over the past 6 years ranging between 400,000 lbs. and 623,000 lbs. with over 574,756 lbs. produced in 2007. This showed a decrease of 17.0% in production compared for the year 2006. In 2007 the fishermen cooperatives produced 480,153.5 pounds and 83,468 pounds of conch meat and fillet, respectively. This represented 48.4% of the total wild marine commodities produced (Figure 5).

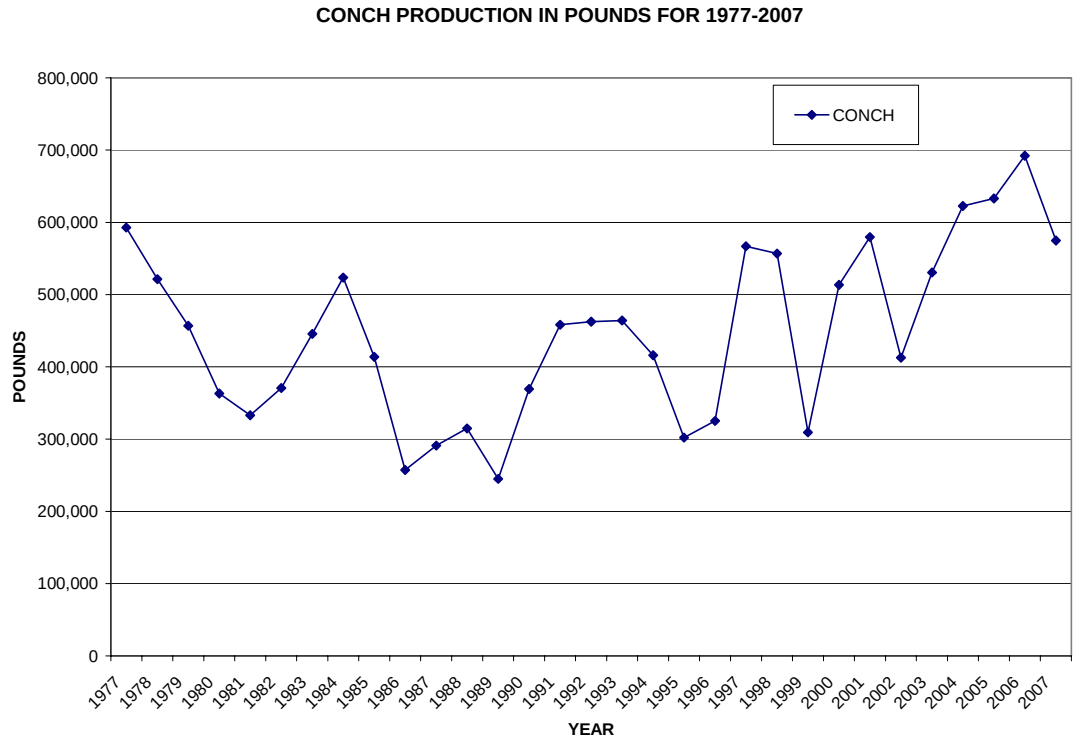


Figure 5. Graph showing conch production for (1977-2007).

2.3.2 Conch Exportation

In 2007 the fishing cooperatives exported 405,600 lbs. of market cleaned conch meat, 54,300 lbs. of fillet conch and 24,050 lbs. of ground conch to the U.S.A. valued at $5.2 million Belizean dollars. This showed a decrease in foreign exchange earnings of 36.0% and 29.5% in export by weight for conch meat

as compared to 2006. Increased fishing pressure has been placed on the conch fishery due to increased demand and lucrative prices on the international market (Figure 6).

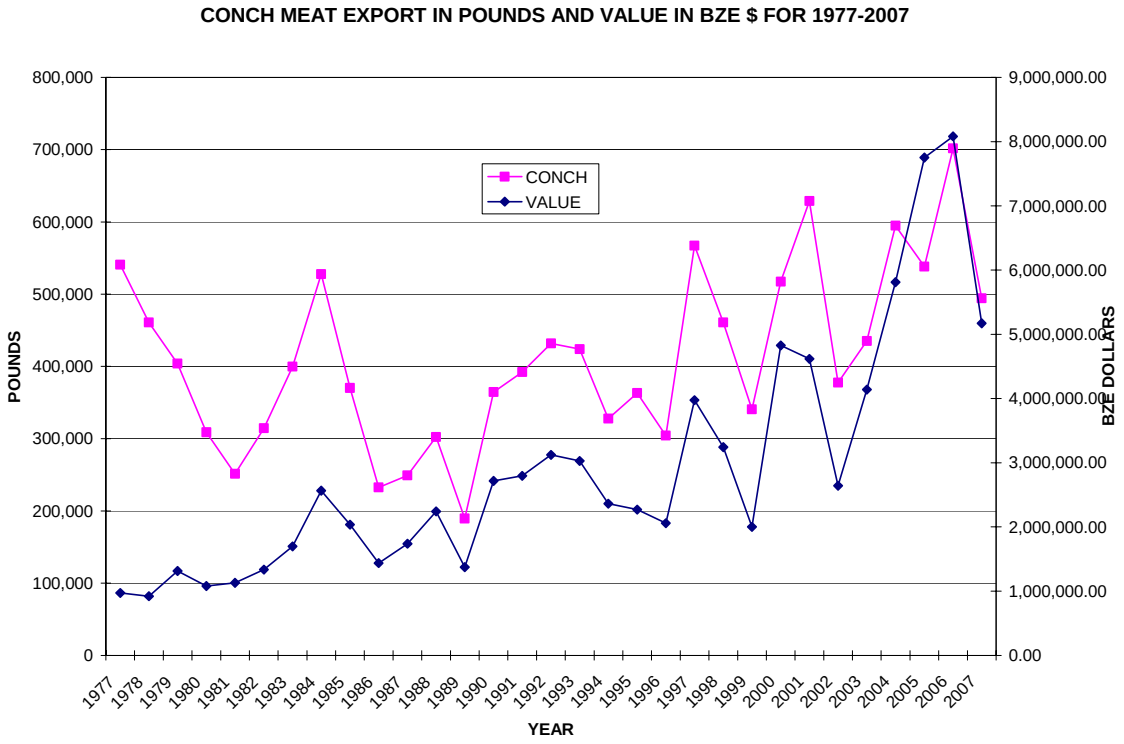


Figure 6. Graph showing exports in pounds and dollars (1977-2007)

2.4 Marine Shrimp Fishery

The Marine Shrimp Fishery can be divided into the Industrial Trawl Fishery and the Coastal Artisanal Fishery. The Artisanal shrimp fishery is a small fishery and is limited to fishing activities in the southern portion of the country where small skiff and canoes are utilized. The Industrial Trawl fishery consists of trawlers designed like those used in the Gulf of Mexico. Presently, the Northern Fishermen Cooperative has two shrimp trawlers operating while in the past the other fishing cooperatives operated under a joint venture agreement with their Honduran trawler owners. The number of trawlers operating during the season depends upon the licenses issued by the Fisheries Department upon applications by the fishing cooperatives involved. It is limited to six trawlers per season.

The production of marine shrimp has had a steady decrease over the last three years. In 2007, it was observed that 26,351 lbs. of marine shrimp was produced showing a decrease of 43.0% in production compared to 2006. This decrease was due to the late harvesting of shrimp during the opening of the season. This production represented 2.3% of the total wild marine commodities produced (Figure 7).

The Marine Shrimp Fishery is economically important to Belize, since it earns foreign exchange revenue and provides employment to many Belizeans. In 2007 the Northern Fishermen Cooperatives exported 750 lbs. of marine shrimp valued at $6,000.00. This showed a decreased in export weight of 87.3% and 92.9% in foreign exchange earnings compared to 2006 (Figure 8).

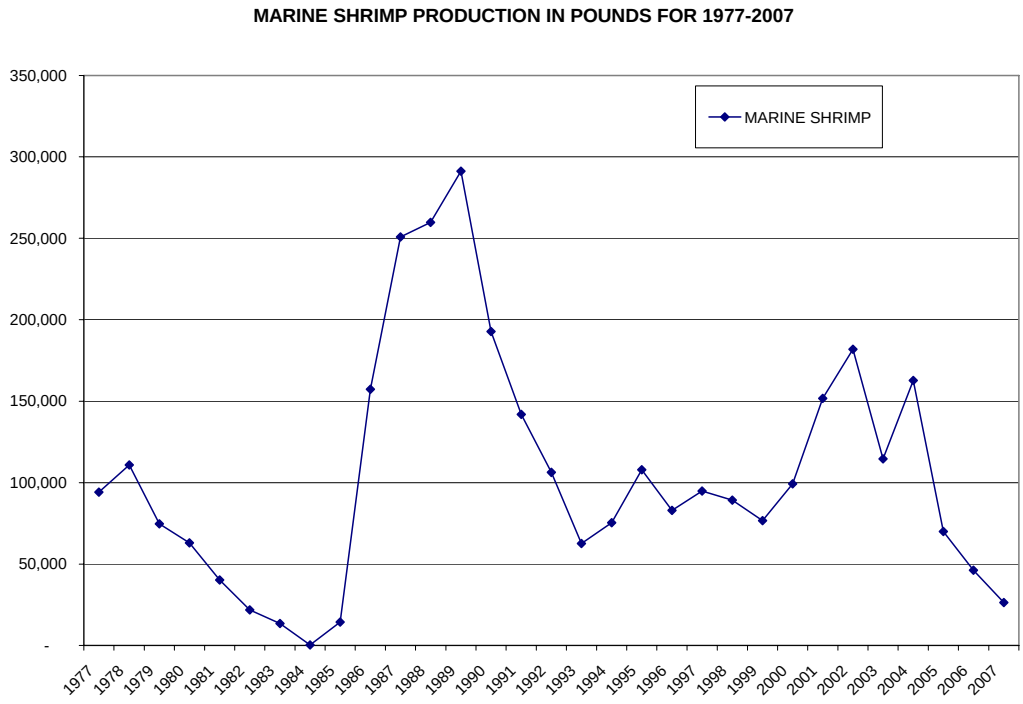


Figure 7. Graph showing marine shrimp production (1977-2007).

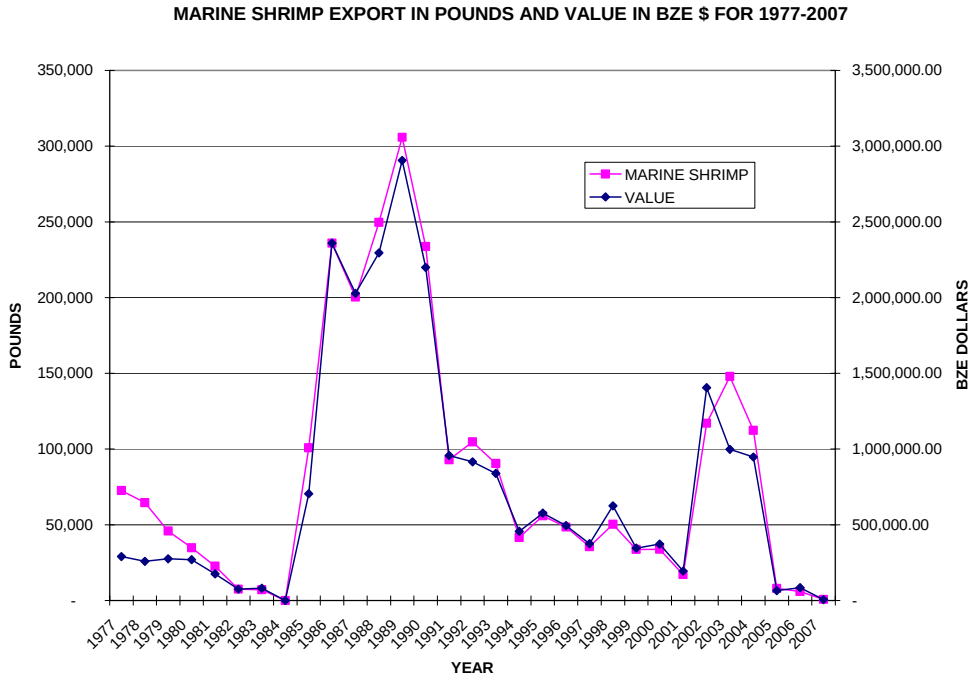


Figure 8. Graphs showing Belize shrimp exports and earnings for period 1977- 2007.

2.5 Marine Aquarium Fishery

In Belize the number of exporters entering this fishery is controlled and therefore it has remained on a small scale. This fishery is a multi-billion dollars business worldwide and is based on both wild capture fishery and cultured species, however, due to environmental concerns there has not been much expansion in this fishery. Presently, there are five companies exporting ornamental fishes to the U.S.A. and Germany. Five exporter's licenses were issued in 2007.

2.5.1 Aquarium fish and invertebrates exportation

Sixty two thousand and thirty four (62,034) fishes valued at $230,355.66 Belizean dollars were exported for the year 2007. This showed an increased of 86.2% in the amount of fish exported and 20.2% in earnings compared to 2004.

3.0 Conclusion

Presently, the lobster and conch and fishery are managed in a sustainable manner. The state of the conch fishery could be described as healthy and there is a healthy spawning stock located in the deep and shallow waters off the coast of Belize. Information on catch/effort for the different fishing areas is being collected presently which has provided an estimate of MSY for the different commercial fish species. This has helped greatly in decision-making and management of the fishing industry in Belize.

GUYANA NATIONAL REPORT

1.0 Executive Summary

Guyana is on the Northern Coast of South America. It has an area of approximately 216,000 km² and is bounded by the Atlantic Ocean on the north, Venezuela on the west and Suriname on the east and Brazil on the south. The coastline of Guyana is 432 km and has a continental shelf of 48,665 km². The average width of the continental shelf is 112.6 km while the area of the EEZ is 138,240 km².

Guyana's marine environment is also heavily influenced by the Amazon whose outflow into the Atlantic south and east of Guyana is estimated at a rate of 200,000 cubic metres per second. The Amazon waters move in a northwesterly direction along the coast of South America and, on account of the heavy particles, is brown in colour. This deep brown colour is evident 40-50 kms from the Guyanese coastline and extends as far north as Venezuela. Accordingly, the marine conditions off Guyana are estuarine and support benthic fauna such as shrimp and a variety of demersal fish species.

The country has a total population of approximately 755,000 and is divided into ten administrative regions.

Figure 1: Map of the Co-operative Republic of Guyana

In Guyana, access to the resources is constrained by licences granted by the government. The government has however failed to effectively implement fisheries management plans due to both inadequate financial and personnel resources. Monitoring, control and surveillance activities have taken back seat to other

activities such as narcotics trade and fuel smuggling which the government is trying to eradicate. Also, over the years fishing has been viewed as an activity of last resort. However, the Government of Guyana is currently working on the revised management plans for the fisheries sector and the recommendations from these assessments can be used in developing the new management plans for the seabob resources.

Fishers through their co-operative societies and the Guyana Private Trawler and Seafood Processors Association have been trying to become more active in the management of the resources. They have asked for some assessment of seabob, grey snapper and banga mary and have indicated that they would be willing to collect the necessary data for such assessments. They have also requested training in the collection of data for the assessments.

1.1 Importance of the fisheries sector

Fisheries contribute towards food security, employment, foreign exchange earnings, and development of rural and coastal communities. Other important industries in Guyana are rice, sugar, bauxite, gold and diamonds. Fisheries is the second highest employer within the agricultural sector.

The fishery sector employs about eleven thousand persons, both in harvesting and processing. It is also a major source of proteins with the estimated per capita consumption being about 45 kg. In terms of GDP fisheries has contributed between 1% and 2 %.

Fisheries also contribute to the export earnings, in 2005 export earnings were in excess of G$11.4 billion with quantities being approximately 19,000 metric tonnes. Finfish and finfish products accounted for more than half of the exports in terms of volume and just less than half in value. In 2006, export quantities dropped to about 18,000 metric tonnes and just over G$10 billion finfish.

Years	**Food Supplies Per capita consumption (kg)**
1980	2
1988	27
1991	45
1996	59.8

1.2 Fishing Area

The EEZ, for statistical purposes, has been divided longitudinally into nine (9) Fishing Zones, each separated by 30-degree interval. Artisanal Users operate on the continental shelf at distances up to 56 km (30 miles) from the shore, all along the coast.

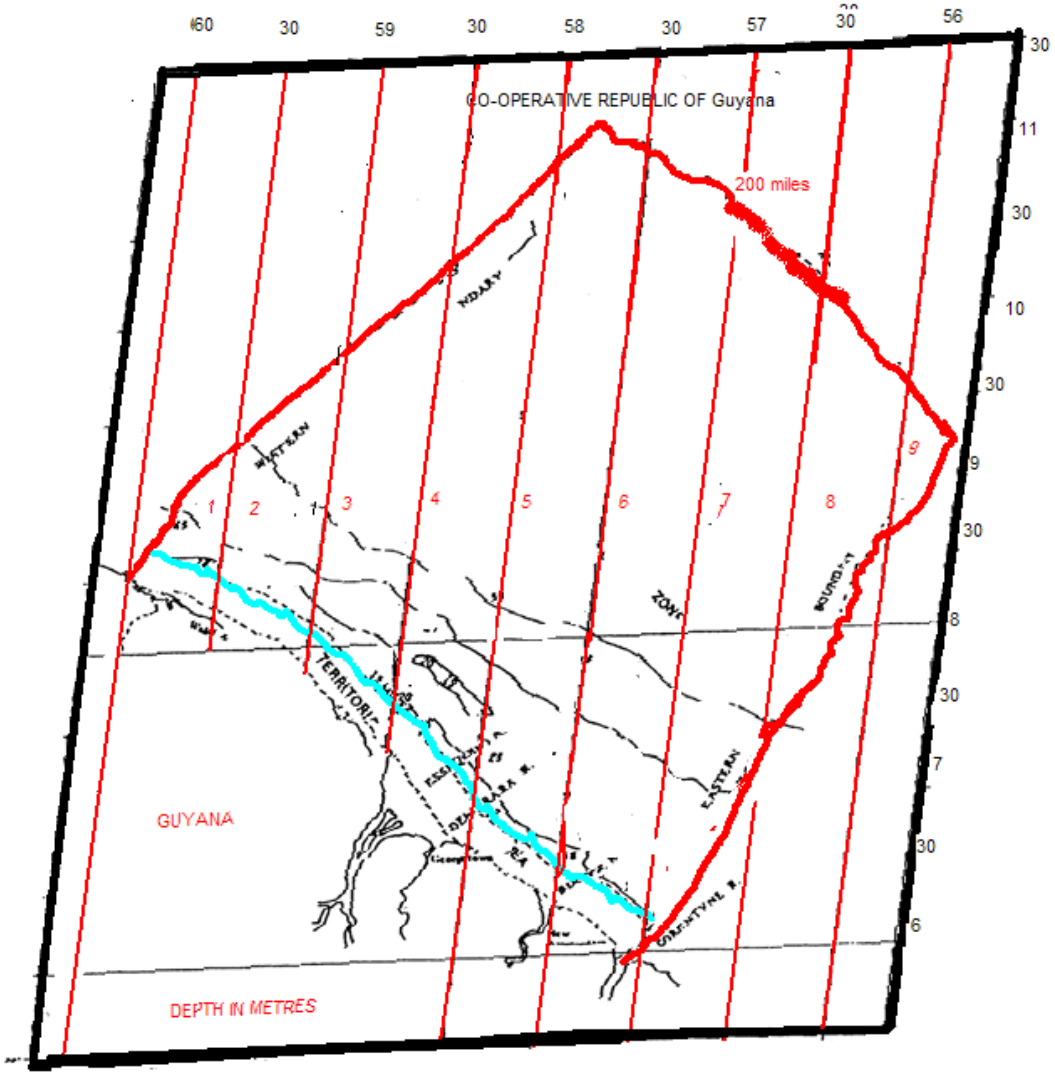


Figure 2: Diagram Illustrating Guyana's Exclusive Economic Zone and Zoning of the Fishing Areas (Draft Fisheries Management Plan, 2006)

2.0 Description of the Fisheries

Guyana has three main fisheries, which are further subdivided as follow:

Inland Fishery

(i) Subsistence Fishery

(ii) Ornamental Fish Fishery

Aquaculture

(i) Brackish-water Culture

(ii) Fresh-water Culture

Marine Fishery

The Offshore Industrial (Trawl) Fishery
The Inshore Artisanal Fishery
The semi industrial Fishery

2.1 Inland

The Inland Subsistence Fishery involves the catching of fish in rivers, lakes, canals, flood plains, etc. by subsistence or part time fishermen for their own consumption or for sale. The activity tends to be influenced by the season and in some areas by the down periods for agricultural and other activities. This fishery is important to the well being of the hinterland population which is about 10% of the population of Guyana. A number of Amerindian communities usually get their main source of protein from the rivers and creeks in their communities. They also depend on the fish for their livelihood. Fish is caught and dried and sold to miners and foresters in their area and in other communities. Over the years a lot of harvesting of one particular species Arapaima (*Arapaima gigas*), has caused the stock to be depleted. The government made it illegal in its 1973 regulations for anyone to harvest the arapaima. However with the opening of hinterland for mining and other activities the ban was completely ignored and a cross border trade developed between Guyana and Brazil.

2.2 Marine Fishery

The shrimp fishery is economically the most important fishery in Guyana. In the late 1950s, foreign companies established bases in Guyana and its neighbouring countries and commenced exploitation of four species of prawn (*Penaeus spp*.) found on the continental shelf. This fishery expanded rapidly until 1975. Then in 1977 with the adoption of the EEZs the shrimp fishery became a national fishery and the local landings dropped along with the fishing effort. The late1980s saw a reduction in catch rates and the total catch of these species (*Penaeus spp*.). This forced some companies to close operations and to sell their vessels to local entities. Many of these vessels owners later converted the trawlers to catch seabob (*Xiphopenaeus kroyeri*). The gap in the data represents the period during the fuel shortage in Guyana between 1982 and 1985 due to foreign exchange deficiencies in the country.

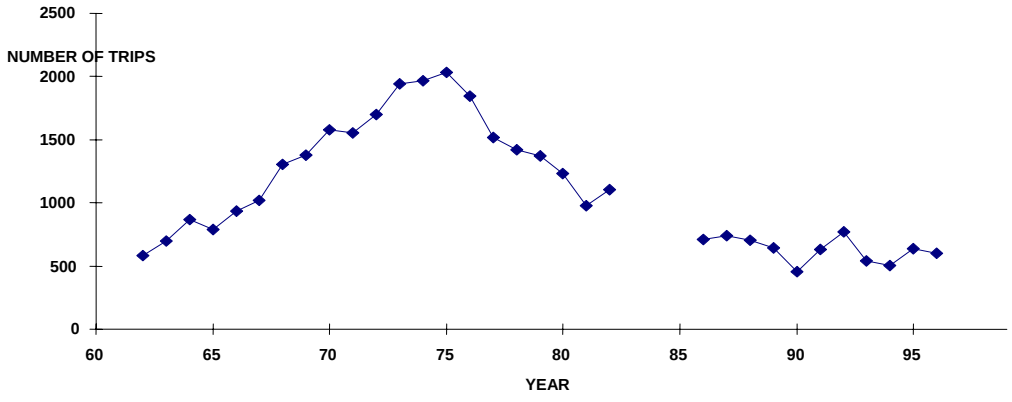


Figure 3: Fishing effort in the Penaeid fishery from 1962 – 1995 (Fisheries Department)

The trawl fishery for seabob started in 1984 and experienced rapid and impressive growth in terms of vessels numbers, total catch, number of processing plants and other infrastructure, peaking in 2000. Seabob production became the dominant activity of the industrial fishery during this period. Resource management and sustainable exploitation, together with rising fuel costs, are currently the major concerns for this fishery. Figure 4 shows the rise in production of the seabob resources and the decline in the prawns' production over the years. Participants in the industrial fishery have formed the Guyana Association of Trawler Owners and Seafood Processors (GATOSP), and its membership includes all six seabob and prawn processing plants, which also own trawlers, and nearly all other trawler owners. The association advocates the cause for the industry and as a unit keeps its members in line as regards to fisheries management issues and government regulations.

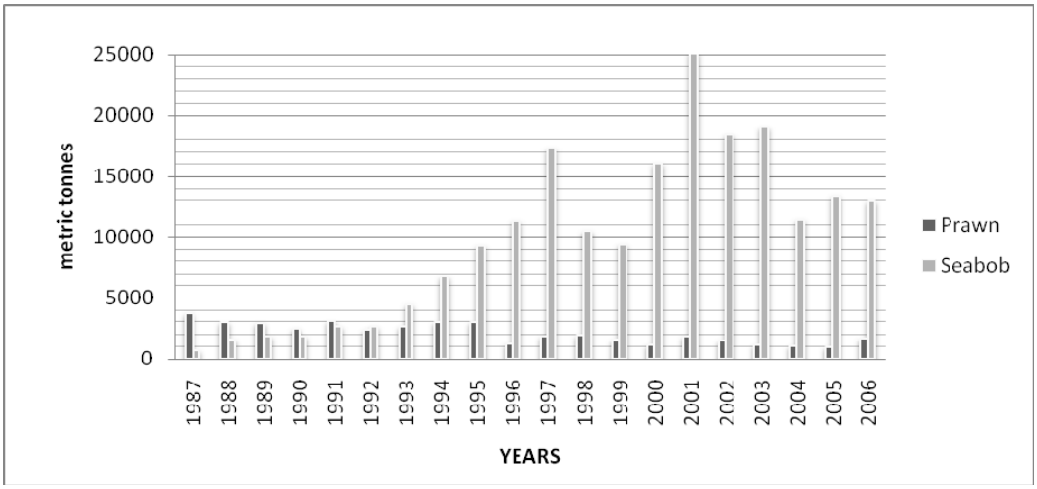


Figure 4: Seabob and Prawn Production 1983-2006 (Department of Fisheries, 2007)

The Offshore Industrial Fishery consists of 147 shrimp trawlers, five major processing plants, nine small processing plants, and a few wharves and dry docking facilities. The shrimp trawlers 45 of them mainly exploit penaeid shrimp *(P. brasiliensis, P. notialis, P. schmitti, and P. subtilis)* with finfish and small amounts of squid (*Loligo spp.*) and lobster (*Panulirus spp.*). The other 102 vessels exploit seabob (*Xiphopenaeus kroyeri*) and various fin-fish species (*Macrodon ancylodon, Micropogonias furnieri, Nebris microps, Ariusspp.,Cynoscion spp.*,), with small quantities of penaeid shrimp as by-catch. These trawlers are all locally owned, about 85% of them are owned by the processing plants and the remainder are owned by private individuals.

The penaeid shrimp vessels would spend an average of 30 days at sea and make approximately 10 -12 trips per year. The seabob trawlers spend 5 - 9 days at sea, but an average trip lasts 7 days. A typical seabob vessel makes 2 - 3 trips per month, and an average of 30 trips per annum. (Fisheries Management Data System Terminal Workshop, Guyana Report, St Lucia, 1999).

Some of the vessels especially those configured for seabob, target finfish when seabob is not in abundance. The seabob/finfish trawlers have been operating closer to shore and nearer to the artisanal vessels and have been causing a lot of gear conflicts with the artisanal fishers. (National Development Strategy of Guyana Chapter 31- Fisheries Sector).

2.3 Inshore Artisanal Fishery

The artisanal fishery has been and still is an important source of food for both rural and urban Guyanese. It is actively pursued exclusively by Guyanese and is a source of employment and export earnings. The sub-sector experienced rapid growth both in numbers of fishers and volume of landings until 1994, and since then the levels seemed to have "plateau then decreased in 1999 until 2002 and production is now between 25,000-30,000 t from 2003-2006 increasing again". This fishery consists of approximately 1200 vessels ranging in size from 6-18 meters and are propelled by sails, outboard and inboard engines. There over 5,000 fishers and over 1000 boat owners, with most of the boat owners being members of co-operative societies which acquire and sell fishing requisites to their members.

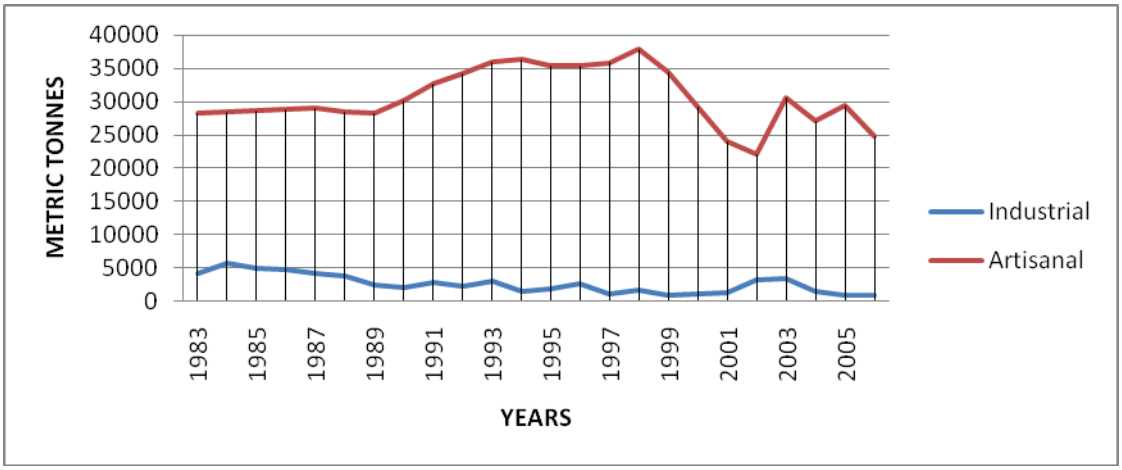


Figure 5: Artisanal and Industrial Finfish Production for over 20 years (Department of fisheries, 2007)

2.4 Constraints of the fishing industry:

- Lack of inadequate scientific information and data in the resources.
- Lack of technical and financial assistance for marine fishery from government and foreign organization.
- Illegal and unregulated fishing.
- Inadequate monitoring and surveillance of fishing.
- Lack of skilled human resources.
- Status of the economy (fluctuation of currency, unrest etc.)

3.0 National Fisheries Policy and Management Objectives

Offshore Industrial Large Penaeid Shrimp Fishery, Industrial Seabob Fishery, Inshore Artisanal Fishery (Pin Seines, Chinese Seines, Cadell Lines, Gillnets) & Snapper/Grouper – Deep Slope Fishery:

- To rebuild and identify target and limit reference points for the Fishery.
- To maintain all non-target species, associated and dependent species above 50% of their mean biomass levels in the absence of fishing activities.
- To stabilise the net incomes of the operators in the large penaeid shrimp fishery.

- To include as many of the existing participants in the fishery as is possible given the biological, ecological and economic objectives listed above

4.0 Research

There is no research being carried out.

5.0 Data Collection Programme

Guyana's data collection system takes into consideration the inshore artisanal and offshore industrial logbook programme, which involves the collection of catch, effort, and biological data from the various fisheries. The logbook and observer programmes are also part of the data collection programme.

The data collection programme is a random stratified programme.
Stratification is done by vessel/gear type. The landings, employment and value of the catch were important factors that led to this type of stratification. This determined the number of vessels to be sampled per month per gear type.

At the start of every month, sampling schedules are prepared in the three Regions for data collection. A total of 82 vessels are chosen to be sampled for data. These vessels are randomly selected from landing sites in the Regions. They include 20 chinese seine, 17 gillnet nylon, 4 cadell,15 gillnet (outboard), 6 gillnet (inboard), 4 pin seine, 3 handlines and 2 traps for the artisanal fishery and 6 seabob and 5 prawns for the industrial fishery.

The vessels sampled in Region 4 are all the industrial vessels and forty-two artisanal. In Regions six and two, the number of vessels sampled is 13 and 14 respectively.

The number of vessels being targeted for data collection has been reduced due to the manpower shortage. Only 65 vessels are being sampled per month.

Sampling is done three days per week Tuesday to Thursday and at least two trips are scheduled per day.
The number of vessels targeted per trip would depend on the landing site being targeted, the number of data collectors and the number of vessels at the site.

Catch and effort and biological data is collected from the vessels selected randomly at the landing sites.

The fisheries Department has suspended its data collection activities. However the industrial fishers submit their log sheets on landing and production.

5.1 Limitations and strengths of sampling Plan

5.1.1 Limitations

Sampling days are fixed and this does not give a true representation of fishing activities at landing sites.
Inadequate resources to conduct activity
Ineffective supervision of data collectors
Ineffectiveness of community participation

5.1.2 Strengths

With the introduction of data collection programme for the artisanal fisheries, production estimates for the artisanal fishery were revised for previous years and the estimates prepared now are more precise.

5.2 Privately Sponsored Data Collection Project

One of the offshore industrial companies has been engaged in a project where the morphometric data of seabob is being collected. This project will last for approximately one year, which will be concluded around September/October. The project has been privately sponsored and the Fisheries Department has been invited to participate in the project.

6.0 Legislation and Management Regulations

Act and Regulations in Force: Fisheries Act 2002 (replaced the 1959 Fisheries Act and portions of the 1977 Marine Boundaries Act).

The DOF liaises closely with the Coast Guard and Marine Police on fisheries enforcement issues, but neither agency has adequate surveillance vessels.

The Department of Fisheries monitors compliance with the TED requirements and utilises its staff (TED Inspectors) for the inspections.

Despite some attempts by the fishing industry to regulate itself (e.g. aerial surveillance of offshore shrimp vessels; providing a patrol vessel for the exclusive use of the Coast Guard), more effective enforcement is required to reduce illegal foreign fishing and over-the-side sales and piracy. Foreign poaching seems to be the greatest concern in the snapper/grouper and shrimp fisheries. Theft of engines and fishing gear and the destruction of nets by other fishing vessels are problematic in the artisanal fishery.

Some of the issues affecting the effectiveness of conducting monitoring, control and surveillance have been lack of resources, the large expanse of the maritime zones of Guyana, operational problems of the Coast Guard and the unresolved maritime boundary delimitation agreements with neighbouring states.

Appendices

FISHERIES SECTOR

1.0 CONTRIBUTION

Table 1. Contribution to GDP and Growth Rate

	2007	2006	2005	2004	2003	2002	2001	2000
Fisheries Contribution to GDP (G$M) real value	161	156	161	157	159	159	165	164
Fishing Contribution to GDP %	2.7	2.7	2.9	2.8	2.9	2.9	3.0	3.1
Annual Growth Rate	3.2	-3.2	2.6	-1.0	0.0	-4.0	1.0	1.1

Source: Bureau of Statistics

2. EXPORT

Table 2. Showing Exports of Marine Products 2000-2007 (Metric Tonnes)

	2007	2006	2005	2004	2003	2002	2001	2000
Year								
Prawns	620	872	910	648	518	682	924	1076
Seabob & Whitebelly	8,968	8,591	9,077	9,039	11,534	9,071	10,923	7,198
Dried Shrimp	11	17	16	21	19	14	8	13
Finish and By-products	8,362	8,012	9,273	12,011	9,787	9,518	6,760	2,612
Crabs & Crabmeat	26	16	21	23	31	31	4	52
Others	47	89	22	15	12	6	70	676
Total Export	**18,034**	**17,597**	**19,319**	**21,757**	**21,901**	**19,322**	**18,689**	**11,627**

3. GUYANA FISH EXPORT DATA (FOREIGN TRADE)

Table 3. Showing Annual Exports 2000-2007

Year	Amount (mt)	Value G$
2007	18,304	10.1 billion
2006	17,597	10.1 billion
2005	19,319	11.4 billion
2004	21,757	12.6 billion
2003	21,901	11.2 billion
2002	19,322	11.5 billion
2001	18,689	11.0 billion
2000	11,627	7.2 billion

Production Statistics for fish and Shrimp from 2000-2007(Metric Tonnes)

Table 4 Production (metric tones) 2000-2007 Source: Department of Fisheries

	2007	2006	2005	2004	2003	2002	2001	2000
Shrimp								
Prawns (wholeweight)	657	1663	1020	1293	1161	1522	1608	1132
Prawns (tail weight)	411	1039	638	808	726	952	1005	708
Seabob	13,752	13,010	13,363	14,485	19,017	18,405	21,097	16,098
No. of Trawlers	90	127	127	139	121	80	80	81
Seabob & Whitbelly (Artisanal)	427 1039	1382 2830	1500 2254	357 2470	188 2218	730 1400	1164 1382	635 1464
Total Shrimp	15218	18885	18137	18605	22584	22057	25251	19329
Finfish								
Fin-fish (industrial)	339	955	962	1486	3311	3175	942	1139
Total Finfish (Industrial)	339	955	962	1486	3311	3175	942	1139
Finfish (artisanal) No. of Boats	26082 1128	24295 1128	29010 1128	26501 1100	29801 1300	21587 1300	25426 1325	28629 1300
Red Snapper No. of Boats	976 40	424 40	341 40	540 45	612 75	424 60	524 48	510
Total Finfish	27397	25674	30313	28527	33724	25186	26892	30278

JAMAICA NATIONAL REPORT

Prepared by: Anginette Murray
Ministry of Agriculture, Fisheries Division

1.0 Fishery and Fleet Descriptions

The Jamaican fishery is made up largely of artisanal fishermen operating from open canoe type boats powered by either outboard motors or oars. The artisanal fishery which operates over inshore and offshore areas has been considered by many to be the 'employer of last resort'. The fisheries of Jamaica have over 20,000 fishers (17,151 registered fishers in November 2007); most of these are artisanal fishers operating from open canoes or reinforced fiberglass-type boats powered by either outboard motors or oars. There are approximately 9,000 boats (4,665 registered boats in November 2007), ranging from 4 to 9 meters, operating from 187 fishing beaches distributed around the Jamaican territorial waters. Vessels 12m and above, powered by inboard engines are considered industrial vessels.

The inshore fishery takes place in the coastal waters of the Island shelf and its nine proximal banks. Historically, this area has supported the bulk of the fishery activities in terms of manpower and vessels. The major fishing gear used for reef fish is the Z-shaped Antillean fish trap. Other common gears include the gill nets, seine nets, hook-and-line, and spear guns. There is some collection of crustaceans, molluscs and algae by SCUBA or skin divers. Larger decked vessels target lobster and conch on the offshore banks (primarily Pedro and Morant Banks; also Formigas, Henry Holmes and Grappler Banks).

In the early 1980s, large companies and investors began processing and exporting conch and lobster caught on offshore banks. The vast majority of the catch is sold fresh for domestic consumption. Most lobster tails, conch and valuable finfish species such as snappers are exported to hard currency markets in a chilled or frozen state. Most of the remaining catch is sold in relatively small quantities to a large number of vendors who then take the fish to the nearby towns and communities where it is sold on local markets.

1.1 Landing Sites

The fisheries landing sites in Jamaica range from beaches with a small number of canoes through to hundreds of vessels including steel-hulled industrial ships. Key fishing beaches are located in Old Harbour Bay, Port Royal, Rocky Point and the modern fishing port complex in Whitehouse, Westmoreland.

Figure 1: Major marine fish landing sites of Jamaica

1.2 Landings Estimates

Annual catches of both marine and inland fishes for the period 1998 to 2007 are shown in the table below.

Table 1. Jamaica fish production trend 1998-2007

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Artisanal	4160.98	6283.74	4585.55	4348.57	7,000.00	4594.92	8811.03	7158.39	12329.85	**11,048.24**
Conch	1700.00	1366.00	0	946	946.00	504.25	550.00	640	650	640
Lobster (Industry)	169.66	284.23	287.77	166.77	130.23	294.69	450.81	300.00	300 (est)	300 (est)
Shrimp	14.54	4.49	36.67	38.5	37.54	37.00	-	875.04	476.10	-
Others [1]	-			51.38	144.00	456.00	-	-	-	-
Total Marine Fish Production	6,045.18	7,984.13	5,139.52	6,327.84	8342.21	5436.17	9495.5	8536.78	13067.83	11,838.24
Total Tilapia Production	4,300.00	4,500.00	4,500.00	5,000.00	5995.44	2968.50	4200.00	4795	7,543.35	5,600
TOTAL Fish Production MT	**10,345.18**	**12,484.13**	**9,639.52**	**11,327.84**	**14,337.65**	**8404.67**	**13695.52**	**14068.43**	**21087.28**	**17,438.24**

[1] Includes shrimp produced by Mariculture.

Table 2. Employment, Export and Percent GDP of fisheries sector over the period 2001 to 2006.

Year	Employment Primary & Secondary	Total Fish Exports(MT)	% of GDP
2001	14,287	1,354.01	0.45
2002	14,998	484.51	0.44
2003	15,682	882.4	0.41
2004	16,789	1,247.44	0.39
2005	17,647	1,378.52	0.41
2006	18,305	1,530.51	Unavailable

2.0 National Fisheries Policy and Management Objectives

The main goals of the National Fisheries Policy are:

(1) Contribute to economic growth and reduction of poverty
(2) Contribute to sustainable livelihood of Jamaicans through employment in fisheries and related activities
(3) Contribute to the provision of Food security

Its immediate objectives are:

(1) Ensure sustainable development of the fisheries sector
(2) Promote efficiency of the fishing and aquaculture industry
(3) Promote economic and social development of fisheries sector
(4) Improve systems and procedures for the management of the fishing and aquaculture industry
(5) Promote partnerships with stakeholders in the management and development of capture fisheries and aquaculture, and ensure transparency and accountability in the governance of fisheries resources.
(6) Comply with international standards and best practices for capture fisheries and aquaculture development and management in keeping with Jamaica's commitments under various agreements and conventions.

The National Fisheries Policy provides a framework for the formulation of strategies designed to address the important issues and challenges and opportunities facing the industry, including: globalization, trade expansion, economic efficiency, industry structure and governance, and food safety and quality.

The goal to be achieved from proper management of the marine fisheries of Jamaica is the sustainable use of fisheries resources for the maximum benefit of the people of Jamaica. The management objectives for each fishery are discussed below.

2.1 Shallow-Shelf and Reef Fishery

Objective: To rehabilitate reef fisheries to sustainable levels within the context of coastal zone management and conservation-oriented fishing practices.

Most of the catch is taken by artisanal fishers using mainly Antillean Z-traps. However prohibited fishing practices such as dynamite, poisons, and other noxious substances remain problematic. Fish biomass has already been reduced by up to 80% on the fringing reefs of the north coast, mainly as a result of intensive artisanal fish trapping. It is hoped that fishing activities could be diverted from the reef for a period, which would in effect reduce fishing effort. We have to encourage co-management of the fishery. Increased surveillance and enforcement of legislation is also needed to stop persons destroying the reef.

2.2 Deep-slope Fishery

Objective: To prohibit fishing effort on spawning aggregations and protect areas where these species normally inhabit during the early life stages.

The deep-slope fishing area within Jamaican waters is relatively small. Catches from the deep slope represent approximately 10% of total annual catch of marine fish. The fishery needs to be better studied. There is also need for increased awareness among fishers of the vulnerability of the stock and the potential for over-fishing.

2.3 Coastal Pelagic Fishery

Objective: To ensure the viability of the fishery through maintaining and enhancing habitat, and protection of nursery areas.

The coastal zone where this fishery is based is an area in use by many other interests (water sport, tourist, harbour use). Management strategy must include some arrangement to reduce conflicts, arrangement to control land-based pollution and coastal development and discourage the use any destructive practices in the zone.

2.4 Large Pelagic Fishery

Objective: The sustainable development of the fishery, to cooperate with other states (particularly Caribbean states) to assess, protect and conserve the large pelagic resource.

This fishery will need to be studied preferable on a regional basis, and a regional management plan developed.

2.5 Lobster Fishery

Objective: To restore/rehabilitate the fishery through protection of lobsters and protection and enhancement of their habitat.

There is already legislation in place to prevent the taking of berried lobster, prohibit the landing of lobsters during the close season. There is need for gear restrictions effort reduction and co-management arrangements.

2.6 Conch Fishery

Objective: To ensure optimum sustainable yields and develop the fishery in other areas.

The introduction of a large-scale industrial fishery, which has almost totally displaced the artisanal conch fishery of the years prior to 1980, has increased production substantially. Conch is particularly susceptible to over-fishing because it is sedentary and aggregates in specific habitats. Estimated catches (based on export data) increased from 50 MT in 1987 to 2,051 MT in 1994; however actual catches may be much higher due to illegal fishing. The fishery therefore needs close supervision and a strong management framework.

New regulations (The Fishing Industry (Amendments Of Schedule) Order 2000) provided for quantity of conch in storage to be declared before the closed season, provides for the inspection of conch in holding areas, establishes minimum size restriction for conch and reserve the coastal shelf for the artisanal fishery.

2.7 Shrimp Fishery

Objective: Ensure sustainability and full efficient use of the fishery.

Some of the gears used in this fishery, takes excessive bycatch due to the inefficiency of the gear. There is need therefore to introduce bycatch reduction devices to the fishery.

3.0 Research

The Fisheries Division conducts research and implements policies and legislations in order to manage and preserve a sustainable fishing industry. Current projects/researches along with resources necessary for their completion are listed below.

3.1 Lobster Casitas

Casitas are small artificial habitats that lobsters can be fished from. The Lobster Casita Project will seek to investigate a more efficient and sustainable system for the lobster fishery through-investigation of the use of casitas in major fishery areas, establishment of juvenile enhancement systems and establishment of pueruli (lobster larvae) monitoring programmes. Although a national project, Bowden Bay in St. Thomas is currently being used as the pilot site and technical assistance is also being sought from Mexico and Cuba. Preliminary biological assessment was also done at the said site. The project will train staff in the use and management of casitas, condominiums, and larval monitoring systems, and provide a basis from which to introduce the use of casitas to commercial fishermen in other areas.

3.2 Fish Aggregation Device (FAD)

FAD is particularly effective in initiating an innovative and sustainable way of easing fish capture through aggregation of [large quantities of] fish into prescribed areas where these artificial floating objects are placed. A trial of this device will be done in Whitehorses, St. Thomas by the fishers and is endorsed by the Fisheries Division.

3.2 Diamond-Back Squid Fishing (JICA/Jamaica Technical Co-operation)

The search for diamond-back Squid in Jamaica began in April 2004, under the joint cooperation between the University of the West Indies, Fisheries Division, the Caribbean Maritime Institute, Caribbean Fisheries and Training and Development Institute (CFTDI) and Japan International Cooperation Agency (JICA) Jamaica. The programme includes training in Diamond-back squid fishing and the development of

the fishery in Jamaica. A survey was conducted to find areas 1000 meter deep, within a short distance from shore. Two such areas were found. The research is still in progress.

3.3 Assessment of Fish Production

The Division through its sampling plan collects catch and effort and biological data to be used for stock assessment and management and for detecting fish production trends. The fisheries targeted include — reef and pelagic resource, lobster and conch, coastal pelagic resource, shrimp and ground fish. There are however a few limitations:

- Limited staff to cover a larger number of beaches thereby increasing the number of sampling days
- Additional resources are needed human, transportation and otherwise

3.4 Monitoring Fisheries Activities during and out of close seasons

The Division continues to execute its regular enforcement activities island-wide during the Lobster (April 1 – June 30) and Conch (gazetted each year) Close Seasons. During these times of enforcement, the Division relies on the support of the hotel industry in providing accommodation as the money allocated is not sufficient to cover all costs.

3.5 Development of Fisheries Policy and New Legislation

This project will address the problems of declining production in the Jamaica marine capture fisheries; it will develop a framework to improve both the institutional capacity and the present management practices in the industry.

3.6 Aquaculture

The Aquaculture Branch has its main emphasis in Fingerling production, Research and Extension Services.

- *Fingerling production* of the Red Tilapia hybrid male is the main type produced and sold to farmers.
- For *Extension Services,* the Aquaculture Branch provides expert advice on Site Selection, Pond Construction, Stocking, Feeding, Harvesting and Marketing through its resource persons or extension officers.
- *Research:* work is currently being done to involve salt water culture of Tilapia. Investigations are also being done on growth and survival of the mangrove oyster *Crassostrea rhizophorea*.

3.6.1 Oyster Culture

Objectives of the oyster culture project include developing marketable products produced from oysters; promoting and marketing the products developed. The Scientific Research Council has responded affirmatively to the request to investigate the development of products using oysters.

3.6.2 Ornamental Fish Production

Ornamental fish production is a blooming area in aquaculture. One of the aims of the Aquaculture Branch is to establish ornamental fish production as a small business enterprise in inner-city communities.

In addition to the ongoing projects of the Division four major sub-projects have been added, namely:

- Fishing beach infrastructure redevelopment for thirty (30) beaches.

- Fisheries conservation and rehabilitation which seeks to improve capture fisheries by the rehabilitation of destroyed habitats.
- Strengthening stakeholder capacity
- Declaration of five fish sanctuaries.

4.0 Legislation and Management Regulations

The 1982 United Nations Convention on the Law of the Sea (UNCLOS) was ratified by Jamaica on March 21, 1983. Subsequently, Jamaica has pursued a consistent policy of updating its laws to ensure full compliance with the provisions of UNCLOS.

The pieces of legislation relevant to the maritime zones and areas of Jamaica are the Maritime Areas Act 1996 and the Exclusive Economic Zone Act 1991. The Maritime Areas Act is an important piece of legislation that has significantly increased Jamaica's jurisdiction over maritime space. The Exclusive Economic Zone Act 1991 established Jamaica's 200 nautical miles EEZ. The enactment of this piece of legislation establishes a maritime regime (about 274,000 km^2) that is approximately 25 times the size of the landmass of mainland Jamaica.

The main pieces of legislation presently governing fisheries activities in Jamaica are the Fishing Industry Act 1975, the Fishing Industry Regulations 1976 and the Morant and Pedro Cays Act 1907, administered by the Fisheries Division of the Ministry of Agriculture, and the Aquaculture, Inland, Marine Products and By Products (inspection, licensing and export) Act 1999 administered by the Veterinary Division.

The main pieces of legislation relating to the management of marine fisheries of Jamaica are the Morant and Pedro Cays Act 1907 and the Fishing Industry Act 1975. These laws establish the system of registration and licensing of fishers and fishing vessels.

Several other statutes contain provisions relevant to fisheries. These are the Exclusive Economic Zone Act 1991, Maritime Areas Act 1996, Natural Resources Conservation Authority Act 1991, Beach Control Act 1956, and the Wildlife Protection Act 1945.

LEGISLATION	OBJECTIVE & SCOPE
PRIMARY LEGISLATION	
Fishing Industry Act, 1975 and Fishing Industry Regulation, 1976	licensing and fishing regulation with territorial and archipelagic seas.
OTHER FISHERIES-RELATED LEGISLATION	
Morant and Pedro Cays Act, 1907	licensing of fishers based on offshore banks
Wildlife Protection Act, 1945	prohibit deleterious fishing practises (eg. Dynamite); protection of manatees; turtles etc.
Natural Resource Conservation Act, 1991	management of coastal zone resources
Natural Resource (National Parks) Regulation, 1993	management of marine parks
Exclusive Economic Zone Act, 1991	management of resource outside 12-miles territorial limit
Town and Country Planning Act	mangrove clearance
Beach Control Act, 1945	infrastructure development on beaches; protection of black coral and organisms
Harbours Act, 1971	conduct of vessels at sea
Territorial Sea Act, 1971The Maritime Areas Act, 1996	declaration of Archipelagic State and territorial seas
The Meat, Meat products and Meat by-products Inspection (Export to specified countries) Act, 1989	export license for seafood and inspection of processing plant

LEGISLATION	OBJECTIVE & SCOPE
INTERNATIONAL CONVENTION & LAWS	
United Nations Conventions on the Law of the Sea (UNCLOS)	- legal order for the seas and oceans which will facilitate international communication and will promote the peaceful uses of the seas and oceans - conservation of living resources - the study, protection and preservation of the marine environment - navigational rights, territorial sea limits, economic jurisdiction, legal status of resources on the sea-bed beyond limits of national jurisdiction
Caribbean Community CARICOM, 1973	- economic integration (Caribbean Common Market) - co-operation in non-economic areas and operation of certain common services - co-ordination of foreign policies of independent member states
Conservation and Management of Straddling Fish Stocks and highly Migratory Fish Stocks	- part of the implementation of the provisions of the UNCLOS
Convention on Biological Diversity, 1992	- conserve bio-diversity - promote the sustainable use of its component encourage equitable sharing of the benefits arising out of the utilization of genetic resources

ST. KITTS – NATIONAL REPORT

1.0 Introduction

1.1 Demographics

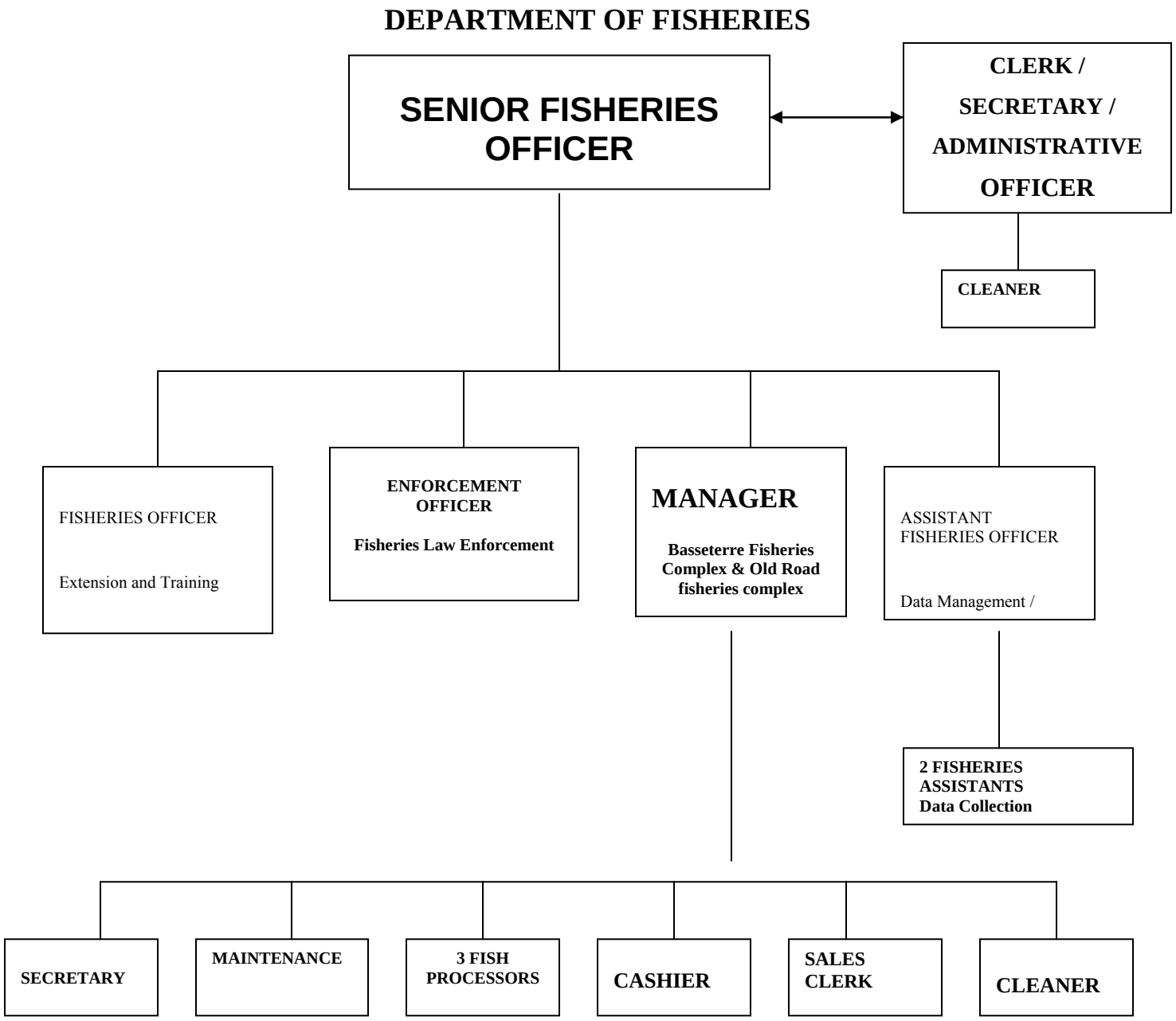
Location: 17 Degrees 15' N Latitude & 62 Degrees 45' W Longitude.
Population: 34,000 (2000 census).
Land area: 68 m^2
Maritime claims: 200 nm, EEZ and 12 nm Territorial Sea.
Fishing area: EEZ (20400 km^2); Shelf (845 km^2)
Coastline: 135 km
Landing sites: 11 overall: (5 major including: Basseterre East *[New Town]*, Basseterre West *[Public Market]*, Old Road, Sandy Point & Dieppe Bay)
Fisheries Act: No. 4 of 1984
Fisheries Regulations: No. 11 of 1995
% GDP Constant:

2000	2001	2002	2003	2004	2005	2006	2007
1.29	1.43	1.55	1.40	1.73	1.86	1.86	

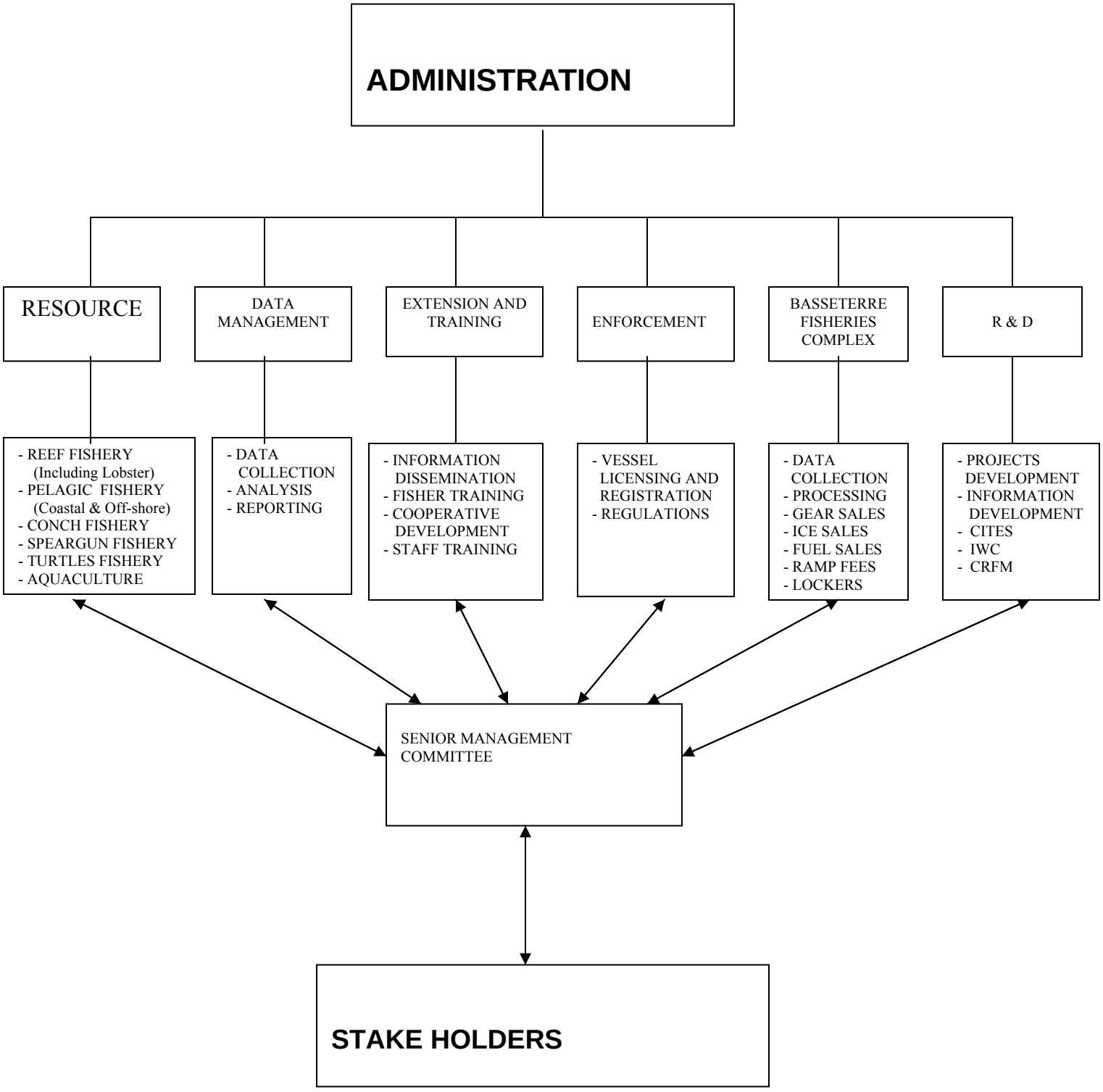
1.2 Mission Statement

To ensure the sustainable utilization of all fishery resources for the benefit of all citizens.

1.3 Staff Structure



1.4 Operational Framework



2.0 Description of Fishery

2.1 Coastal Pelagic Fishery

2.1.1 Objective

Promote the positive aspects of the traditional nature of this fishery and encourage new entrants.

2.1.2 Focus

Enforcement of fisheries regulations.

2.1.3 Data

Year	1999	2000	2001	2002
Qty (lbs)	225,950	250,740	243,390	289,740
Value EC$	1,280,830	1,361,161	1,092,370	1,491,580

Year	2003	2004	2005	2006
Qty (lbs)	222,510	295,340	229,063	194,000
Value EC$	1,391,950	1,548,020	1,603,441	1,350,000

2.2 Off-Shore Pelagic Fishery

2.2.1 Objectives

Increase landings. Increase use of Fish Aggregating Devices (FAD).

2.2.2 Main Focus

Catch handling and preservation. Availability of gear.

2.2.3 Data

Year	1999	2000	2001	2002
Qty (lbs)	49,270	63,500	67,250	95,890
Value EC$	348,225	438,250	461,070	671,230

Year	2003	2004	2005	2006
Qty (lbs)	49,040	100,090	107,376	49,170
Value EC$	378,030	571,300	859,008	393,360

2.3 Reef Fishery

2.3.1 Objective

Promote stock recovery.

2.3.2 Focus

Reduction in landing of juvenile species. Regulation enforcement and conservation measures.

2.3.3 Data

Year	1999	2000	2001	2002
Qty (lbs)	199,850	122,150	337,210	295,570
Value EC$	1,609,810	874,970	2,071,820	2,173,030

Year	2003	2004	2005	2006
Qty (lbs)	289,010	386,070	298,097	221,740
Value EC$	2,274,490	3,174,930	2,640,653	1,914,370

2.4 Lobster Fishery

2.4.1 Objective

Promote stock recovery.

2.4.2 Focus

Control the landing of and exportation of juveniles and lobsters with eggs. Regulation enforcement.

2.4.3 Data

Year	1999	2000	2001	2002
Qty. (lbs)	32,090	11,850	33,790	21,180
Value EC$	385,080	142,200	405,480	254,160

Year	2003	2004	2005	2006
Qty. (lbs)	5,440	8,430	57,890	28,970
Value EC$	68,280	101,160	694,680	347,640

Note! Lobster data 2003 incomplete

2.5 Conch Fishery

2.5.1 Objective

Promote stock recovery.

2.5.2 Focus

Education and certification of conch divers. Preparing industry to deal with international requirements (HACCP).

2.5.3 Data

Year	1999	2000	2001	2002
Qty. (lbs)	45,980	67,960	102,620	78,670
Value EC$	275,880	407,760	718,340	550,690

Year	2003	2004	2005	2006
Qty. (lbs)	96,550	136,670	263,220	120,230
Value EC$	675,850	716,520	1,843,240	841,400

2.6 Turtle Fishery

2.6.1 Objectives

Rehabilitate turtle populations.

2.6.2 Focus

Activities relating to sand mining, beach front lighting, regulation enforcement.

2.7 Aquaculture

2.7.1 Objective

Encourage aquaculture production as a viable production enhancement method.

2.7.2 Focus

Provision of technical assistance and information.

3.0 Data Management

3.1 Objectives

To develop and implement systems for proper fisheries information collection, analysis and reporting.

3.2 Focus

Continuation and improvement of the CFRAMP Data Collection Programme.

3.3 Data (Registered Boats and Fishers)

Year	1999	2000	2001	2002
Boats	224	287	287	303
Fishers	309	338	373	450

Year	2003	2004	2005	2006
Boats			361	385
Fishers	477	490	501	542

4.0 Fisheries Extension

4.1 Objectives

To promote co-management and the exchange of ideas and technical information between all stakeholders.

4.2.1 Focus

Fisher and Cooperatives development.

5.0 Research and Development

5.1 Objective

To promote activities and services that will enhance Fisheries Development.

5.2 Focus

Development of public awareness programmes and coordination of research activities.

6.0 Fisheries Enforcement

6.1 Objective
Promote compliance with Fisheries Regulations

6.2 Focus
Fishing vessels inspection, monitoring and registration and regulation enforcement.

7.0 Basseterre & Old Road Fisheries Complex

7.1 Objectives
To stimulate fisheries development in order to attain broader economic and nutritional benefit and improve balance of payments through reduced fish imports.

7.2 Focus
Improved production through improved marketing facilities. Improved quality through improved product handling.

8.0 Future Development

8.1 Challenges
-Lack of proper berthing facilities
- lack of adequate boats
- fishers unwillingness to spend longer periods at sea
-inadequate infrastructure
-inadequate monitoring, surveillance and law enforcement
-limited human and financial resources
- lack of appropriate resources for research
- Incapable of coastal surveillance and monitoring.

8.2 Opportunities
-In better utilization of the seasonal pelagic fishery
-for fishers to obtain more sea worthy boats for the particular fishery
-in training of different methods of fishing.
- in aquaculture
- improved fish handling and marketing

SAINT LUCIA NATIONAL REPORT

Prepared by: Sarita Williams-Peter, Fisheries Biologist
Department of Fisheries, Ministry of Agriculture, Forestry and Fisheries

1.0 Background

1.1 Description of the fishery

The Queen conch, *Strombus gigas* (Linaeus, 1758) is one of the single species nearshore fisheries of Saint Lucia. For the most part, fishers harvest stocks using SCUBA gear. However, conch is still harvested with gill nets and by free diving in areas along the west and southwest coasts (Rambally, 1999).

Conch is commercially exploited by over 40 fishers in depths ranging from 11 m to 43 m. Fishers mainly operate out of fibreglass pirogues ranging in length from 7.02 – 8.45 m, powered by outboard engines of 115 – 250 hp. Walker (2003), reported that while conch is targeted commercially by some fishers throughout the year, other fishers focus their efforts on this resource during the low period for "offshore" pelagic species, for, on average, five months. Fishers of this resource can be divided into part-time and full-time. Full-time fishers conduct dives on an average of four times each week, alternating harvesting and rest days, whilst part-time fishers operate twice each week (DOF- Conch divers' survey, 1999). Walker (2003), reported that the majority of divers conduct greater than three dives per trip and approximately 100 – 500 individual conch are landed per trip. However, the quantity of conch landed per trip is dependent on the number of divers and the number of dives conducted during the trip. Subsistence exploitation in shallower areas occurs, but the extent is unknown.

Due to the nature of the fishery, the marketing system and an informal policy of the Department of Fisheries, the majority of conch harvested are landed whole (live) and then sold immediately.

Figure 1 presents the estimated landings of conch and total landings during the period 1993-2007:

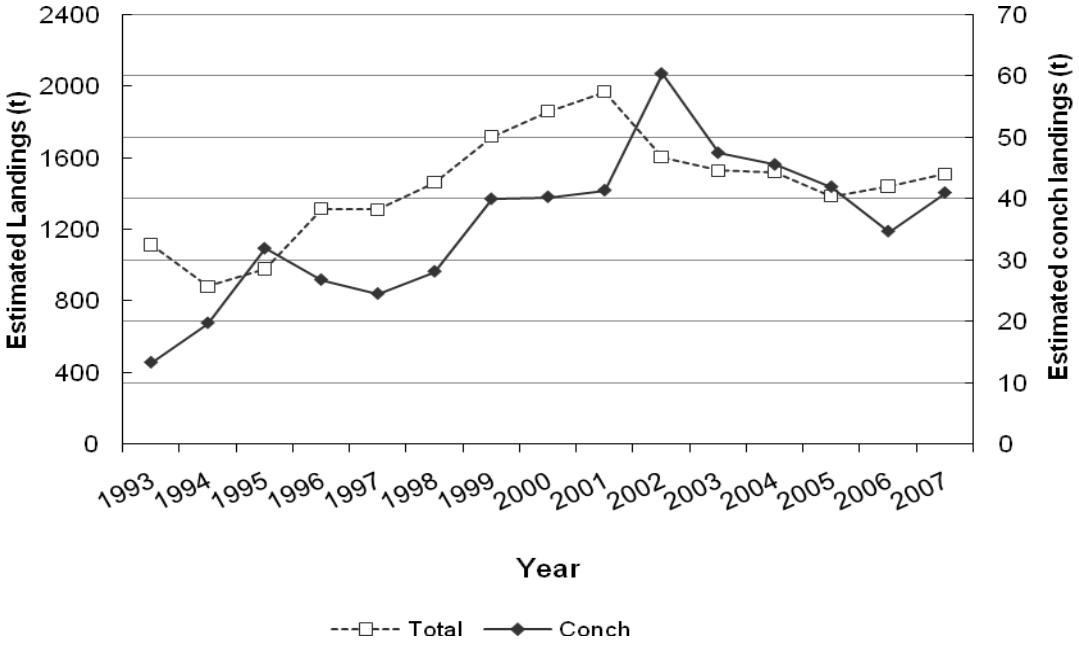


Figure 2: Estimated landings of conch and total landings during the period 1993-2007

1.2 Description of the resource

There have been no recent density studies in the field. The last of such surveys was carried out in the early 1980s, and was very limited giving rough density estimates for a few conch populations in the north and south of the island. As such, the current status of conch stocks in the waters of Saint Lucia is virtually unknown (Nichols and Jennings-Clark, 1994). However, it is noted that presently, nearshore stocks have been over exploited and existing stocks are mostly located in deep water, requiring SCUBA gear for harvesting.

Information obtained from a survey of vessels targeting conch resources (Walker, 2003), indicated that divers harvest conch regularly from various areas off Cas en Bas, Esperance, Grand Anse, Gros Islet, Mennard and Marisule in the north; Vieux Fort and Caille Bleu in the south; and Dennery on the east coast. Conch vessels target, on average, three areas on a rotational basis. At this point, the northern population is thought to be more heavily exploited than the southern population.

In 1996, a conch biological data collection initiative commenced and extended for a period of two years. The main aim of this initiative was to gather information in order to assess the status of the conch resources of the island so as to guide management decisions. Previous to this data collection exercise, the fishery was severely under recorded and information required to conduct basic monitoring of the resources was unavailable and in some cases, had never been collected. The following summarises some preliminary findings of this study:

- *Strombus gigas* harvested by commercial fishers from fishing areas in the north and south were sampled. Fishers involved in the study were asked to land all sizes of conch. Harvesting was done using SCUBA gear only.

- A total of 4,390 conch were sampled 3114, from the northern fishing ground and 1276 from the southern fishing ground. Less than eight percent (7.4 %) of the sampled conch were immature, that is, did not have a flared lip. Sex was determined for a total of 317 conch of which just over 45 % were female. For both areas, lip thickness showed a predominance of conch in the 15 –27 mm size classes, with the greatest percentage in the 24 – 26 mm size classes. Very few conch with lip thickness less than 5 mm were landed.

- The mean shell length, lip thickness, total weight and meat weight were larger in the south compared to the north.

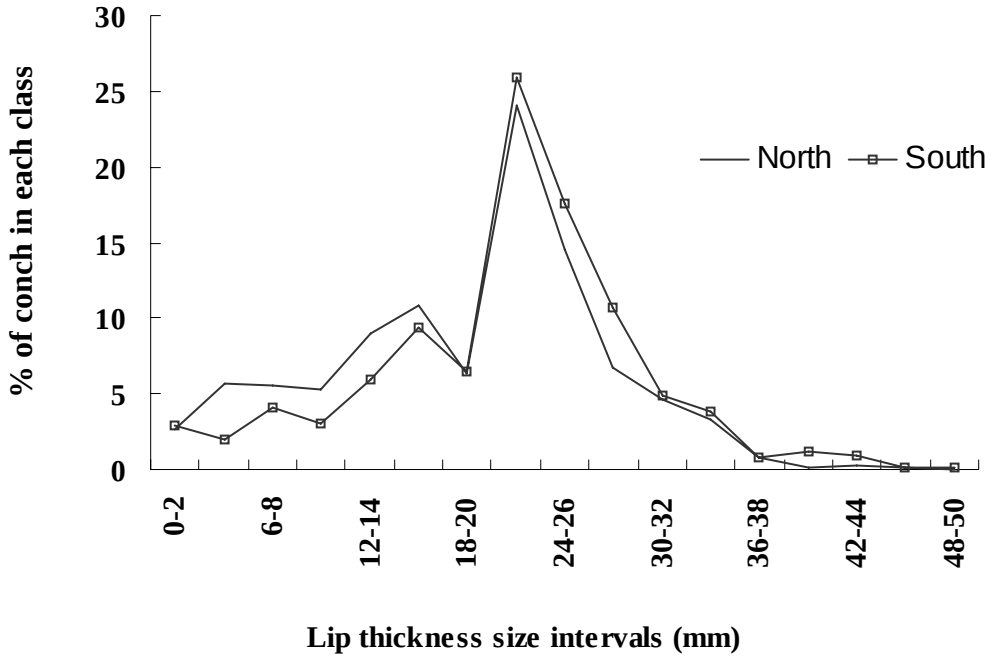


Figure 2: Lip thickness composition of queen conch sampled in the northern and southern fishing areas.

- For both fishing areas, the majority of conch were found in the 200 – 280 mm size classes. But, peaks were obtained in the 260 mm – 279 mm range for the south and 220 – 239 mm range for the north. The majority of conch found in the south were of a larger total shell length compared to those from the north. Over 99% of the total conch harvested had shell lengths greater than 180 mm, that is, the minimum size limit.

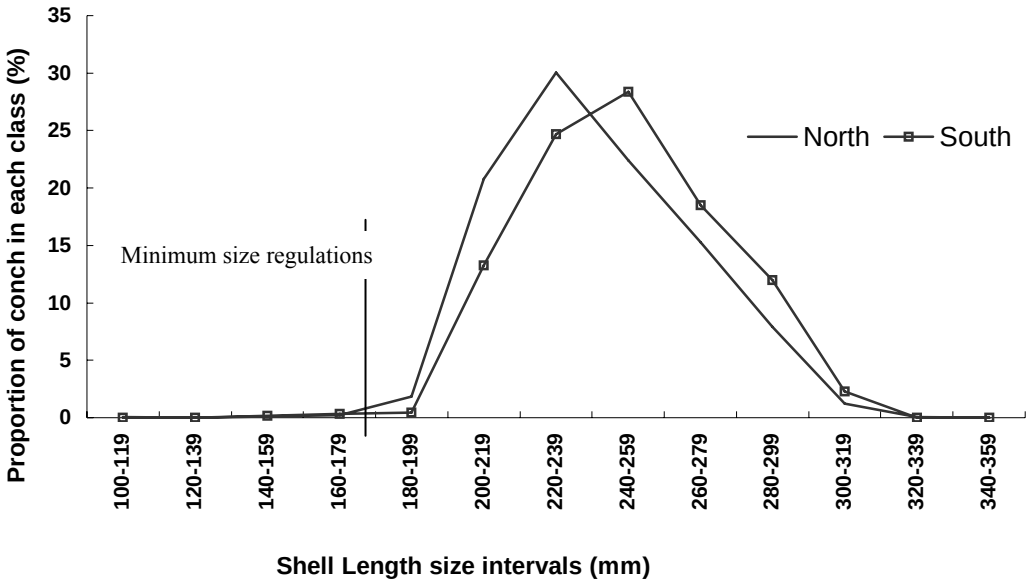


Figure 3: Shell length composition of queen conch sampled in the northern and southern fishing areas.

The mean shell length, lip thickness, total weight and meat weight were larger in the south compared to the north (Table 1).

Table 1: Summary Statistics for length, weight and lip thickness by sampling area.

N= Number of individuals; S.D.= standard Deviation; F = Females, M = Males

Area	Shell Length (mm)			Meat Weight (g)			Lip Thickness (mm)		
	N	***Mean***	***S.D***	***N***	***Mean***	***S.D***	***N***	***Mean***	***S.D***
North									
All	3114	239.44	26.95	149	283.28	100.31	3114	19.19	8.42
M	72	225.26	13.65	78	295.51	102.07	77	22.58	7.91
F	77	230.99	718.89	71	270.07	96.80	72	23.51	7.51
South									
All	1276	246.25	27.03	49*	331.63	132.50	1276	21.37	8.27
M	73	233.53	13.87	13	370.17	146.18	73	28.32	9.64
F	96	238.59	24.92	34	322.68	84.64	96	28.33	10.01

*Sex was not determined for three conch in the sample.

- Analyses revealed that although less than 10% of the conch sampled were immature (without a flared lip), less than 0.5 % were less than 180 mm total length, meaning that the majority of conch landed are above the minimum size limit articulated in the Fisheries Regulations No. 10 of 1994. This supports the conclusion drawn from the crude method adopted previously, where monitoring landings was done by examining stock-piles of discarded conch shells. Examinations indicated that the fishery was targeting mainly adults, since juvenile landings were negligible. Stocks are thought to be sustaining the current level of fishing, although shallow water stocks have been over exploited.

- Conch matures at about 2.5 – 3 years, when shell lip has completely formed and thickens to 5 mm (Appeldorn, 1994). From preliminary analyses, the majority of conch landed appeared to be older than 3 years.

1.3 Current status of issues affecting the management of queen conch fisheries

The following summarises the information on demand, market and other issues affecting the conch fishery:

- Currently, the major market for conch meat is the local market, which serves both the tourism sector and nationals. Over the past few years, there has been a growing demand for conch meat as a result of activities such as seafood festivals, developed in several communities to stimulate economic development in these communities. To date, these festivals take place weekly in four major communities namely, Gros Islet, Dennery, Anse La Raye and Vieux Fort.

- From a survey conducted by Walker (2003) the local markets identified for conch were the Saint Lucia Fish Marketing Co-operation, hotels, restaurants, seafood festival vendors and the public. This survey also revealed that there is a daily demand for the product, unlike in the past, when conch had to be enclosed in nearshore pens until sale was obtained.

- Sale of conch shells, especially in the tourism sector is another area for economic benefits. Shells are polished and sold as souvenirs. In 2002, the Standing Committee of CITES withdrew recommendations to suspend imports of conch from Saint Lucia and COP 12 agreed that shells of the Queen conch would qualify as exempt from the provision of Articles III, IV and V of the Convention under the category of personal and household effect. Under Resolution, Conf. 12.9 "Queen conch (*Strombus gigas)* shell – up to three per person do not require export or import permits, or re-export certificates, for personal or household effects for the dead specimens, parts and derivates." Before 2002, the number of shells leaving the island was monitored by the provision of CITES permits. However, this avenue for recording trade in fewer than four shells no longer exists.

- Although biological data have been collected in the past for this species, the collection of such data has not been sustained after the termination of externally funded projects.

- Morphological differences among various conch populations in Saint Lucia have implications for management measures e.g. especially for those relating to shell length and weight.

- Information on stocks is still scarce, especially information on density, abundance and distribution. This scarcity of information limits informed management decisions.

- Although stocks are thought to be sustaining the current level of fishing pressure, fishers have moved from the nearshore depleted resources to resources offshore. However, more recently, reports suggest that the depths at which the conch are now found is becoming an even greater limiting factor on the number of dives that are being conducted.

- In general, fisheries management and enforcement agencies have limited surveillance and enforcement capacities.

2.0 Data System

2.1 Data Collection

The first fisheries data collection system for the island was implemented in 1979. Since then, the system has undergone considerable refinement and revision, in an effort to satisfy the information required for decision- making and sound management advice, whilst responding to numerous changes in the fisheries sector, in recognition of human resource and financial limitations (W B. Joseph, unpublished a). Over the past decade, very little information on major single species fisheries, such as conch, has been collected on a consistent basis.

The main aim of the data collection system is to monitor the status of the stocks that are being exploited. However, due to the nature of different fisheries, fishermen's perceptions or behaviour and both national and global economic issues, strategies implemented to gather necessary information require constant modification, in order to capture in a timely manner, the changes occurring in the fishery. Nonetheless, due to administrative, financial and human resource constraints, there is often a time lag in modification of these strategies, and therefore, there can be instances of lack of current specific data to guide particular management decisions.

Overall, the current fisheries data collection systems include several components such as gathering of data on catch, effort, registration of fishermen and vessels, SCUBA diving and snorkelling establishments, sports fishing vessels and spear gun fishers, in addition to licensing data of fishers and fishing vessels, dive and snorkel leaders.

The catch and effort data collection plan is based on a stratified random sampling regime of three major strata: primary, secondary and tertiary landing sites, based on the number of vessels operating, the fishery types and the volume of fish landed (W.B. Joseph, unpublished b). Of the 23 landing sites from which the fisheries operate, catch and effort data are collected from eight on a regular basis. Under this sampling plan, conch landings were only captured for Gros Islet in the north, where the majority of conch were landed. In 2001, the sampling plan was revised to include two other sites along the southwest, where fishers from one of these sites are also known to target conch. This revision has improved the information base for this species. Analysis of data collected in 2002 showed that conch was now landed at four landing sites: Gros Islet, Castries, Laborie and Vieux Fort.

Due to traditional practices in the fishery, collection of adequate data on landings of this resource has been challenging. However, during the jointly funded CFRAMP and Government of Saint Lucia funded conch biological data collection programme, sufficient data were collected and many lessons learnt. One such lesson is that it is essential that data collection for this fishery be undertaken as part of a collaborative framework between management agencies and fishers.

2.2 Data Analysis and Management

Catch and effort data are analyzed twice a year, using a raising factor function, based on the fishing activity (total number of vessels and number of fishing days) and effort of collectors based on a stratified sampling plan (days and vessels sampled by collectors).

For all catch and effort data, integrity checks are carried out both prior and preceding data entry. Prior to data entry, data sheets are checked for errors and omissions with the data collectors whilst subsequent to data entry into Trip Interview Programme (TIP) data are also validated and verified for errors and omissions.

Data are backed up and stored on diskettes at regular intervals throughout the year using WINZIP. A copy is made when the last batch of data are entered for the calendar year. Data are stored on site as well as off location.

Data collected by the administration of questionnaires are stored in an electronic form. All data sheets are filed using the Data Management Unit filing system.

3.0 Policies and Legislation

3.1 Fisheries Management Plan

Two management objectives have been defined for this resource and are articulated in the *Plan for Managing the Fisheries of Saint Lucia (2001- 2005).* They include rebuilding the nearshore stocks and ensuring sustainable use of this resource. Options identified for attaining these objectives include initiating a flared lip thickness restriction, controlling effort through a licensing system, implementing closed areas and/or seasons, and co-management arrangements with resource users.

It should be noted that this fishery management plan is currently under review.

3.2 Fisheries Legislation

At the national level, Fisheries Regulations in place since 1994, provide protection for this resource. This legislation states:

I. No person shall -
   a. take from the fishery waters, sell, purchase, or at any time have in his possession any immature conch; or
   b. take from the fishery waters, expose for sale, purchase or at any time have in his possession any conch during the closed season for conch as specified by the Minister by notice published in the Gazette and in a newspaper which is printed or circulated in the State.

II. In this Regulation -

   a. "conch" includes the whole or any part of any conch;
   b. "immature conch" means a conch with -
      i a total weight of less than one kilogramme;
      ii meat weight of less than 280 grammes after removal of the digestive gland;
      iii a shell which is smaller than eighteen centimetres in length; or
      iv a shell which does not have a flared lip.

However, in 2000, the Department of Fisheries with assistance from FAO, embarked on an initiative to revise the fisheries legislation. The following are proposed amendments for the new fisheries legislation as they pertain to conch:

- Inclusion of a lip thickness in the definition of an immature conch (less than 5 mm).
- Removal of the stipulated shell length limit.
- Provision for closed areas.
- Provision for a national permit system for harvesting of conch.

Further, the current fisheries legislation allows a maximum fine of $5000.00 for each offence and/or incarceration. However, the newly drafted fisheries legislation proposes to increase the fines relating to various fishery offences.

3.3 Convention on International Trade of Endangered Species (CITES)

Saint Lucia is currently in the process of finalising and institutionalising national CITES enabling legislation. Fines being proposed in the draft CITES legislation range from EC$10,000.00 – EC$200,000.00, depending on the offence.

Apart from the three conch limit mentioned earlier, the import and export all conch and conch products are regulated under the CITES restrictions.

4.0 Proposed Study

Notably, in August, 2003, the CITES Secretariat issued a notification (Resolution Conf. 12.8), requiring that over the next 18 months, Saint Lucia and other countries engaging in conch export, conduct population assessments and other pertinent research relating to the management of queen conch.

Subsequent to this, Saint Lucia developed a proposal to undertake a number of activities, namely:

Historical survey

- Develop a detailed questionnaire to capture historical, anecdotal information on the conch fishery. This survey instrument will focus on social and geographical issues, catch and effort, demand, economics and trade, resource use, awareness and trends.
- Identify older, past or present conch fishers to be interviewed, using the questionnaire.

Preliminary surveys

- Conduct preliminary surveys with conch fishers to identify suitable areas for survey activities.
- Based on results from preliminary surveys, study sites will be selected for research.

Assessment surveys

- The location of each study site will be recorded using a global positioning system.
- A field data sheet will be designed to record data collected during assessment surveys. This sheet will contain fields for recording information regarding the habitat, conch and dives.

Collate data and information

- Publish the findings of surveys in a comprehensive booklet on the conch fishery (a past, present and future outlook).
- Disseminate the booklet to relevant agencies and persons.

Note that under the European Commission Special Framework of Assistance (SFA 2003) funding, some work in this regard has commenced.

5.0 References

Appeldorn, R. (1994), Status of Queen Conch Fishery in the Caribbean Queen, In:R.S. Appledorn & B. Rodriquez (Ed.) *Conch Biology, Fisheries and Mariculture* Fundacion Cientifica Los Roquez, Caracas, Ven.

Department of Fisheries (2001) *Plan for Managing the Marine Resources of St. Lucia* Department of Fisheries St. Lucia. 54pp

Joseph, W (unpublished a) *Fisheries Data Collection System for Saint Lucia.*

Joseph, W (unpublished b) *Conch Fishery Resources of Saint Lucia*.

Nichols K., and Jennings-Clarke, (1994) An overview of the Conch Industry in St. Lucia, West Indies In:R.S. Appledorn & B. Rodriquez (Ed.) *Conch Biology, Fisheries and Mariculture* Fundacion Cientifica Los Roquez, Caracas, Ven.

Rambally J. (1999) An overview of the Conch Fishery of St. Lucia.

Walker, L. (2003) Conch Fishery of Saint Lucia: analysis of questionnaires administered to boat owners. Unpubl. Ms.

ST. VINCENT AND THE GRENADINES NATIONAL REPORT

Compiled by: Cheryl Jardine-Jackson

1.0 Introduction

1.1 The Fishing Industry of St. Vincent and the Grenadines

- The fishing industry in St. Vincent and the Grenadines is:
  - Predominantly small scale and artisanal, employing traditional gear, methods and vessels.
  - The majority of fishing vessels are open and powered by outboard engines.
  - These vessels exploit both oceanic and inshore pelagics as well as the shelf and deep slope demersals.
  - Most fishermen are daily operators, going out to sea in the morning and returning to land in the late afternoon or evening

1.2 Quick Facts about the Fishing Industry in SVG

- Approximately 2.1 million lbs of fish are landed annually.
- Approximately 0.41 million lbs of fish are exported annually.
- The annual per capita consumption of fish is approximately 23 lbs.
- Fishing contributes 2% to the Gross Domestic Product (GDP)
- Workers in the fishing industry represent 6% of the labour force.
- There are over 800 fishing vessels operating at landing sites throughout SVG.

2.0 Fishery and Fleet Description

GROUP	DESCRIPTION
Offshore Pelagics	These are fast swimming migratory fish that inhabit the deep sea. Species include tuna, billfish, dolphin, kingfish. These species contribute approximately 35% (.88 million pounds) of the total estimate of fish landed and marketed, realizing annual value of 2.8 million dollars.
Inshore Pelagics	These are near shore fish found in mid water or surface water in sheltered bays. They are generally smaller than offshore pelagics, e.g jacks, robin, dodger. On average these species contribute approximately 45% (1.13 million pounds) of landings to the local market, realizing an annual value of 3.6 million dollars.
Demersals	These are fish dwelling at the sea bottom, e.g rock hind, blem (queen snapper), groupers, parrotfish. These species contribute approximately 10% (0.25 million pounds) to the local market, realizing an annual value of 0.8 million dollars.
Shellfish	Shellfish are marine species usually living at the sea bottom and protected by a shell. E.g lobster, conch. Average annual contribution to landings is 5% (0.13 million pounds) with an average value of 0.4 million dollars. However, shell fish contribute an estimated 24% to average annual exports.
Sharks	Sharks are fast swimming migratory fish that inhabit the deep sea and have a cartilaginous skeletal structure. Sharks are not particularly targeted in the fishery,

	however, by catch could be significant especially in the longline fishery. Estimated annual landing for shark are less that 20,000 pounds at a value of $60,000.
Turtles	Turtles are reptiles that spend the majority of their lives at sea; however, the females come on land to lay their eggs. Marine sea turtles are taken mostly opportunistically by fishers. Estimated annual landings are 20,000 pounds. Poaching and catches out of season would probably contribute to this figure being higher.
Whales & Porpoises	These marine mammals are migratory, or pelagic in the case of porpoises. They suckle their young e.g humpback whales and blackfish. There is a traditional significance with respect to the harvesting of marine mammals in St. Vincent and the Grenadines. Humpback whales are targeted in Bequia and subject to IWC (International Whaling Commission) regulations while the pilot whale and dolphins are targeted mainly by Barrouallie fishers.

Vessel Types	Description	No. of Vessels
Flat Transoms (Bow & Sterns	These are commonly called bow and stern or dories. They are open boats of 3 – 6 m (11- 27ft) in length. They are constructed from wood or marine plywood which in many cases are covered by epoxy or fiberglass, which provides a waterproof covering. They are often powered by one or two outboard gasoline engines ranging from 14 – 115 horsepower. Oars maybe the only form of propulsion on rare occasions. These vessels are used mainly in the lobster and conch fishery in the Grenadines.	230
Pirogues	These are open boats with a pointed bow and flat transom, however, the bow is much higher than that of the flat transom boats and they tend to be slightly larger, ranging from 7 – 10 m (19 – 30 ft) in length. They are constructed from fiberglass and powered by one or two outboard gasoline engines ranging from 40 -85 horsepower. These vessels are predominantly used in the trolling and demersal fisheries.	222
Double enders	Double enders or "two bows" are open wooden boats ranging from 3 – 9 m (10 – 29 ft) in length. Both ends of the boat are shaped like the bow of a boat. In most cases the only means of propulsion are oars, but occasionally, they may be powered by a small outboard gasoline engine specially rigged at one end of the boat. These engines range from 6 – 48 horsepower. These vessels are used mainly in the beach seine fishery.	182
Longliners	In SVG these vessels range from 34.7 ft – 48.5 ft in length. The main type of longliner is a Yanmar type made of glass reinforced plastic (GRP) powered by inboard diesel engines ranging from 90 – 190 hp. They are multi-purpose in nature and designed to operate up to 150 nautical miles from the islands with a 3 to 5 day stay at sea. These vessels are used primarily for tuna longline fishing, but may be utilized for trolling, bottom longline fishing, pot fishing and angling.	13

The CPUE for most of the vessels and fishery type is calculated using the gear, the number of trips per year and the sample weight in lbs per year.

3.0 National Fisheries Policy and Management Objectives

The overall policy for the fisheries sector is the sustainable use of all fisheries resources to maximize benefits to all Vincentians in the present and future. The strategies and policies concerning fisheries management and development will be under continuous review with the involvement of all stakeholders. Management regimes will serve to enhance the opportunities for fisheries to play a greater role in national food supply, thereby helping to alleviate under-nutrition and contribute to national food security. Emphasis will continue to be placed on the protection of the marine environment, in an effort to maintain and enhance its carrying capacity. Fisheries development goals and strategies will ensure the betterment of the socio-economic conditions of all stakeholders/beneficiaries within the Vincentian population. Fisheries development and management will take full account of the present and potential contributions from marine fisheries. Essential factors of production such as fishing boats, gear and technology, skilled personnel and research capability will be considered.

3.1 Fisheries Management Objectives

- Develop and increase the potential of living marine resources to meet human nutritional needs, as well as social, economic and development goals of the sector.
- Ensure that the fishing industry is integrated into the policy and decision-making process concerning fisheries and coastal zone management.
- Take into account traditional knowledge and interests of local communities, small-scale artisanal fisheries and indigenous people in development and management programmes.
- Maintain or restore populations of marine species at levels that can produce the maximum sustainable yield as qualified by relevant environmental and economic factors, taking into consideration relationships among species.
- Promote the development and use of selective fishing gear and practices that minimize waste in the catch of target species and minimize by-catch of non-target species.
- Ensure effective monitoring and enforcement with respect to fishing activities.
- Protect and restore endangered marine species.
- Preserve rare or fragile ecosystems, as well as habitats and other ecologically sensitive areas, especially coral reef ecosystems, estuaries, mangroves, sea grass beds and other spawning and nursery areas.
- Promote scientific research with respect to fisheries resources.
- Cooperate with other nations in the management of shared or highly migratory stocks.

3.2 Management Objectives by Fishery

FISHERY	TARGET SPECIES	OBJECTIVES
Shallow Reef Fishes	Hinds, parrotfishes, squirrelfishes, grunts, surgeonfishes, triggerfishes	To promote stock recovery by • encouraging fishers to fish further off-shore • continue to enforce the fisheries laws as they relate to destructive fishing practices • not increasing the current effort of harvest
Deep Slope Fishes	Snapper, groupers	Maximize catches within the limits of the potential yield
Coastal Pelagics	Jacks, herrings, silversides, anchovies, ballyhoo, robins, small tunas	Encourage co-management of the fishery Maintain artisanal nature of the fishery
Large Pelagics	Tunas, billfishes, dolphinfish, wahoo, sharks, swordfish, whales, porpoises	Cooperate with members of ICCAT particularly Caribbean states to assess, protect and conserve the large pelagic resources Promote development of the commercial and sport fisheries.
Lobster	Spiny lobster	Rebuild stocks in depleted areas by continuing to observe • the close season. • Conservation areas • Size limits • Restrictions on moulting • Berried lobsters • Certain harvesting practices ("Scrubbing")
Conch	Queen conch	Rebuild stocks in depleted areas by continuing to observe • Minimum size limit • Closed areas

4.0 Research

Past Research Projects:

1. Determination of consumption preference among the population of St. Vincent and the Grenadines; comparing people's preference between fish and other animal protein.
2. Assessment of red hind (*Epinephelus guttatus*) fishery to determine the abundance and distribution of the species
3. Lesser Antilles Pelagic Ecosystem (LAPE) Project; SVG was one of the 8 participating countries under this 5 year project, ending in Dec 2007. The project was one of the first to conduct an ecosystem management approach to fisheries for the Lesser Antilles region. The project focused on pelagic species including cetaceans. Project components included various biological and socio-economic fisheries surveys, primary production studies and fish and cetacean diet studies. One of the main results being the development of an ecosystem model for aid in regional fisheries management.

Current Research Projects:

1. The Artificial Reef Project falls under the SVG and Japanese Government collaboration project *'Introducing measures to maintain and enhance Fisheries Resources'* that began in 2003. The Artificial reef project saw the deployment of 2 artificial reefs in the Grenadines. It is specific to enhancing the biological and ecological knowledge of the country's Spiny lobster stocks (*Panulirus argus* and *P. guttatus*) for improved sustainable management of the lobster fishery. Research has been hindered by lack of financial and human resources.
2. The National Fleet Expansion Programme is designed to encourage fishermen to upgrade their fishing fleets with improved fishing technology and safety requirements, allowing them to target higher valued species and hence improve productivity and their livelihood. This will further develop a sustainable fisheries sector and contribute to the attainment of national food security and self reliance.
3. The National Sea Turtle Conservation Programme aims to improve our knowledge about sea turtles found in SVG waters and conserve present nesting and foraging populations.
4. The Conch and Lobster Survey project will combine both fisheries dependent and independent surveys. This aims to provide an initial assessment of the fisheries and will achieve expansion and improvement of a long-term data collection system on landings for these two species. An updated management plan will be developed for conch and lobster.
5. Small coastal pelagics survey; Similar to conch and lobster, catch statistics and anecdotal information indicate a decline in small coastal pelagics targeted in the beach seine fishery. It is felt that the increase in export of live bait played a large part in this decline, and in response the SVG Government has implemented a one year ban from April 2008 on export of live bait. An improved management plan for the small pelagic fishery is required and must include a comprehensive data collection programme for the beach seine fishery. An abundance and distribution survey is being developed to provide a rough baseline indication of the status of the fishery.

5.0 Legislation and Management Regulations

The Fisheries of St. Vincent and the Grenadines has the following pieces of legislation to assist with the management and development of the sector.

- The Maritime Areas Act (1983) – Act No. 15 of 1983, declares and establishes the marine area of St. Vincent and the Grenadines. This enables the state to define the following areas (1) Internal waters (2) Archipelagic waters (3) Territorial sea. (4) Contiguous Zone (5) Exclusive Economic Zone (EEZ) (6) Continental Shelf (7) Territorial Extent and (8) Safety Zones.

- The Fisheries Act (1986) and Regulation (1987), which form part of the OECS harmonized legislation, cover: Fisheries access agreements, local and foreign fishing licensing, fish processing establishments, fisheries research, fisheries enforcement and the registration of fishing vessels. The legislation also specifies conservation measures such as prohibiting the use of any explosive, poison and other noxious substance for the purpose of killing, stunning, disabling, or catching fish; closed seasons, gear restriction, creation of marine reserves. The legislation gives the Minister responsible for fisheries, the authority to create new regulations for the management of fisheries when necessary.

- Fish Processing Regulations of 2001 drafted in response to international pressure for monitoring and controlling the quality of fish and fish products leaving and entering SVG. The legislation makes provisions for the control of marketing, handling, transporting and storage of fish and the operation of fish processing establishments.

- The High Seas Fishing Act of 2001, which provides the legal basis for the regulations of St. Vincent and the Grenadines registered vessels fishing on the High Seas. The act provides for constant monitoring of these fishing vessels in a effort to produce accurate information, which under provisions of the act is mandatory in order to be compliant to the International Convention for the Conservation of Atlantic Tunas (ICCAT)

- Other Fisheries Related Legislation – Town and Country Planning Act (1992) – Coastal Zone Management, Forestry Act (1945) – Mangrove Protection, Mustique Conservation Act (1989) - Management of the conservation areas on and around Mustique.

SURINAME NATIONAL REPORT

1.0 Introduction

Suriname is an independent country, on the northern coast of South America, with a land area of 163,265 km^2, a shelf area of 54,550 km^2 and a continental coastline of 380 km. The capital is Paramaribo and the total population was estimated in 2004 at 492,829 heads.

The agriculture sector is very important for the social well being of the people including; food security, job opportunities and export products. The execution of the agriculture policy also tries to achieve the Millennium Development Goals. Development in this sector could help to: eliminate poverty and hunger, improve living standards for rural communities, and promote sustainable exploitation of resources for a sound environment and gender equity.

In 1978, the EEZ was proclaimed and the industrial fishery, which had been established earlier, became important to the country. In September 2005, fuel prices increased dramatically with lots of implications for the agriculture sector.

TYPE	UNIT	2000	2001	2002	2003	2004	2005	2006
Total agriculture imports (crops, live stock and fishery)	1000 ton USD mln	126 76	143 81	138 81	148 91	132 97	150 120	154 123
Total agriculture exports	1000 ton USD mln	100 56	101 60	99 57	65 50	94 58	99 60	111 59
Crops exports	1000 ton USD mln	86 21	86 13	80 16	46 10	75 19	77 21	88 24
Fishery exports	1000 ton USD mln	13 34	14 40	18 40	17 37	16 36	17 34	19 33
Exports other agriculture products	1000 ton USD mln	1 1	1 2	1 1	2 3	3 3	4 5	4 3
Active occupied persons (working)	Available jobs	95.374	97.872	105.129	111.547	112.175	117.841	119.777
Active persons in agricultural sector including processing		11.646	10.839	9.386	9.634	10.865	13.896	11.191
Agricultural contribution of available jobs	%	12	11	9	9	10	9	9

2.0 Fishery and Fleet Description

In Suriname the major fisheries resources are the marine resources, which are exploited by shrimp trawling fleets, finfish trawling fleets, Red snapper & Mackerel handliners and Large Pelagic longliners. In the coastal areas large canoe type vessels with inboard and outboard engines using drifting gillnet, pin seine and the bottom longlines are utilized.

In the river mouth fishing is done by canoe type boats. There are 3 different types of Chinese seines, of which one is mainly for catching finfish. Therefore they are categorized as large (FJ, for fish), medium (FK) and small (FN) for seabob, and white belly shrimp and juvenile fish caught together in the net. The Chinese seines use polyethylene net of different sizes.

Fixed gillnets used in the lagoons are made of a number of nylon nets of 20m in length. The nets are attached to poles on the top side as well as the bottom side. The mesh size used ranges from 3 cm up to 4.5 cm.
River seine boats use gillnets with mesh sizes ranging from 5 – 6 cm. The net is set in a circular way using one boat.

In the 1990s some companies started with the culture of the white leg shrimp *(Lithopenaeus vannamei*) and the Tilapia Red Hybrid. These have had some success because the shrimp farms were still operational in 2004. The main geographic area of industrial aquaculture is the district Commewijne, located in the coastal area mid-east of Suriname. The main geographic areas of small scale aquaculture are the districts Nickerie, Saramacca and Paramaribo.

Estimated catch by fisheries in ton				
	2004	**2005**	**2006**	**2007**
fish				
COASTAL FLEETS	9,710	9,097.7	12,966	11,036
TRAWLERS	4,943	5,370	6,096	7,620
TUNA LONGLINE	90	78	------	------
RED SNAPPER	963	944		1,394
shrimp				
Xyphopenaeus kroyeri	10,567	8,927	10,340	8,233
Prawns (Penaeid)	1,900	1,900	982.4	780
Aquaculture	288	242	------	------

3.0 National Fisheries Policy and Management Objectives

The role of the fisheries sector could be expressed as follows:

- Assurance of reasonable animal proteins (fish production) for the local population.

There should be enough healthy and safe food for everybody at anytime that should be derived from local fish production. Food security and safety are the leading themes of the policy.

- Provide jobs (primary and secondary level).

Create more qualitative job opportunities and reasonable incomes. Diversity of the sector is also important.

- Create a balance of payment through export of fish and shrimp products.
- Contribute to the GDP of the country.
- Contribute to the national budget through fees and income tax.
- Stimulate and support new fishing techniques to increase production on a sustainable level.

The exploitation of the non-traditional species, such as small and large pelagics is promoted. Artisanal fishermen still using traditional methods and are reluctant to use new techniques. There is need for knowledge and awareness on new views on quality, competing cost price.

It is difficult to identify universal management objectives that would be valid for all resources. On the contrary, the objectives and/or their priority order will vary with the type of resource and the type of fishery, and so will the strategies and the types of measures to be taken to achieve them. There are, however, global objectives that are pursued by fishery management as a whole in Suriname, such as:

- Long term conservation of the resources.
- Maximisation of the long-term production of fish; contribution to the protein supply to the local market; production of affordable protein. These objectives can be seen as different expressions of achieving MSY (Maximum Sustainable Yield). It should be noted that MSY estimates, when they are derived from survey data, as in Suriname, tend to be optimistic, and therefore should be treated with caution.
- Maximisation of the long-term economic yield (MEY): the level of harvest required to achieve this objective is always lower than the MSY level.
- Contribution to the trade balance; generation of foreign currency; maximisation of exports. These objectives may coincide with MSY or MEY.
- Contribution to employment; maximisation of the number of households making a living out of the fishery, directly or indirectly; maintaining or improving living standards of the communities that depend on fishing and related activities.
- Solution of conflicts between different exploitation modes and/or stakeholders.

General statistics and information on fleets (2007)							
	# of licenses	**Engine (Hp)**	**Gear type**	**Unit of effort**	**Fishing area**	**Target species**	**Sampling programme**
Industrial fleets					Sea (EEZ)		
Shrimptrawlers	47	400-500	Bottom trawl	Days at sea	≥ 15 fathom	*Penaeus subtilis, P.brasiliensis*	
Seabobtrawlers	28	400-500	Bottom trawl		10-18 fathom	*Xyphopenaeus kroyeri*	
Fishtrawlers	17	350-800	Bottom & Pelagic trawl		≥ 15 fathom	*Lutjanus synagris, Cynoscion virescens, Scombridae*	
Snapperboats	4	200-500	Vertical Hand lines		≥ 15 fathom	*Lutjanus purpureus*	
coastal fleet			Drifting gillnet		Sea (Coastal)		
Decked boats (inboard)	65	48-165	Njawarie (Pin seine)	Days at sea	0-8 fathom	*Cynoscion acoupa, C. virescens Arius parkeri, A. proops, Macrodon ancylodon, Nebris microps,*	
Open boats (outboard)	298	25-125	Bottom Longline				
Inland and estuary fleet					Rivers		
Chinese seine	243	10-65	seine	1 day	River&mouth	*Xyphopenaeus kroyeri, Nematopalaemon schmitti*	
Longline	10	15-40	Bottom Longline	1 day	River&mouth	*Arius passany, A. couma, A. proops*	
Drifting gillnet	154	6-55	gillnet	1 day	River&mouth	*C. virescens, A. proops,*	
Sport	85		gillnet		Rivers	*Plagioscion surinamensis*	
Fixed gillnet	36	6-40	gillnet	1 day	Rivers	*Plagioscion surinamensis, hyplphthalmus edentatus*	
Dragnet	1	None		1 day	Rivers	River shrimp	
Riverseine	9	14-15	Encircling net	1 day	Rivers	*Plagioscion surinamensis*	
Lagoon gillnet	36	6-15	gillnet	Days	Lagoons	*Mugilidae, Centropomidae Tilapia mossambica*	

4.0 Research

The fisheries department has planned the introduction of closed season(s)/areas from 2009. However, due to circumstances the observer programme that was to be carried out in 2007 and 2008 was not performed, and the information necessary to decide upon the time and area for closure of fishing could not be determined.

The fisheries department will obtain information through an observer programme to be conducted in 2007 and 2008; and assessment with the help of a consultant. Observers will be placed on all trawlers for at least one trip during July 2007 and August 2008. In 2008 3 – 4 seminars will be held with all stakeholders to arrive at the suitable time and area for closure of fishing.

In 2008 a bio-economic study also will be conducted to analyze the true benefits from especially the shrimp fishery.

Development prospects

The Ministry of Agriculture, Animal Husbandry and Fisheries has made up an Agricultural Sector Plan, a document that includes all projects to be conducted within the period of 2006 – 2010. The following projects are selected for Fisheries.

- Fish Inspection Institute was established in April 2007. All arrangements have been made and the equipment needed will be bought. The institute will be located at Cevihas, Bethesda.

- Fisheries Act, this act will replace the Decree C-14 for marine fisheries. There is a draft act since 1995, which has been delayed for several reasons.

- Aquaculture Act, this is new, but there is a draft also dated 2004. Changes are being made to get this act passed by the Assembly.

- National Residue Plan for fisheries products, this laboratory facility is very important in the aquaculture sector.

- Fish Disease Monitoring Plan, also important in the aquaculture sector.

- Integrated Rice-Fish culture in the district of Nickerie.

At Cevihas, Paramaribo a small-scale fisheries center, donated by JICA (Japan International Cooperation Agency) was built. This will be a landing site for artisanal fishing boats that satisfy the standards provided by the Fish Inspection Act at Cevihas. One hundred and seventy-two boats which have been forced to use unsanitary, inefficient landing sites will utilize the site. Enhancing maintenance and increase of yield, assurance and improvement of quality of marine products supplied by artisanal fishermen is also another project.

5.0 Legislation and Management Regulations

The Fisheries Laws in Suriname till this date are:

1. The Fish stock protection Act: effective in 1961 and was last revised in 1981. This Act contains the procedure for fishing license in the inland waterways of Suriname.

2. The Sea fisheries Act: effective in 1980 and was last revised in 1981. This Act contains the procedures for fishing in the Territorial Waters and the Exclusive Economic Zone.
3. The Fish Inspection Act: effective in 2000. This Act contains the guidelines for exporting fish and fish products to the European Union, Canada and the United States of America.

4. The Fish Inspection Decree: effective in 2002. This Decree is to implement some of the articles of the Fish Inspection Act.

Due to circumstances the Act regarding Aquaculture is still a draft. With the exception of the Fish Inspection Act and the Fish Inspection Decree, the other abovementioned Acts need to be revised. The Aquaculture and the Fisheries Act (a junction of the Fish stock protection Act and the Sea fisheries Act) are scheduled to be effective by 2007.

Some of the reasons for the Fisheries Act are:

1. Parts of the Sea fisheries Act is not in accordance with international agreements, such as the United Nations Conventions Law of the Sea (UNCLOS).
2. The fact that the inland fisheries can not always be clearly defined from the inshore fisheries. The new Fisheries Act will provide articles that apply to the fishing activities in the Surinamese waters and the protection of the marine environment.

The fisheries Act is intended to ensure sustainable exploitation of the fish stock in Surinamese waters.

On January 7th 2005 at the ministry of Agriculture, Animal Husbandry and Fisheries, the Board of Deliberation for Coastal & Marine Fisheries was inaugurated, according to article 26 of the Sea fisheries Act of December 2001. The main duty of this board is to advise the minister on fisheries matter, such as licenses and fishing regulations.

5.1 Management Regulations

Vessel Monitoring System

All fishery types are regulated by fishing operation into zones. Complaints have been made that fish trawlers do not operate in the designated zone which causes a lot of conflict among the different fishery types. Therefore, the Fisheries Department had started in January 2007 with a VMS to control all activities by the trawl fleets, using the ARGOS system.

Control of fishing effort

Since licensing is compulsory for all fishing units, fishing effort can be limited by restricting the number of fishing licenses. This is feasible for the part of the fleet delivering the catch in Suriname. Control at sea is of course, required to prevent illegal fishing. A maximum number of licenses are agreed every year for the types of fisheries exploiting stocks which are believed to have reached or exceeded the Maximum Sustainable Yield (MSY).

Monitoring

Because fisheries can alter the state of the resources more or less quickly, monitoring (statistical and biological) is always necessary, and co-operation on this matter should be put as a standard condition for the right to fish. Possible monitoring systems include the reporting of catch and effort by the fishermen, the registering of the landings by enumerators, the recording of data by observers on board, logbooks, etc.

TRINIDAD & TOBAGO NATIONAL REPORT 2008

Fisheries Division, Ministry of Agriculture, Land and Marine Resources

1.0 Introduction

Trinidad and Tobago has a mixed marine environment as a result of the differing oceanographic regimes around the islands. In the northeast the waters are mainly oceanic as a result of the passage of the north and south equatorial currents, whereas in the southeast of Trinidad, which is directly downstream of the major South American river systems, namely the Orinoco and the Amazon, the environment is estuarine in nature. The combination of the oceanographic regimes and the country's geographic location on the Brazil-Guianas continental shelf results in a variety of habitats and hence a diversity of marine fisheries resources (Appendix 1). The resources and fisheries off Trinidad are typical of those off northeast South America. There is greater similarity between the resources and fisheries off Tobago and those off the northern islands of the eastern Caribbean.

2.0 Description of the Fisheries

The resources of Trinidad and Tobago have been grouped according to habitat and form the basis of the fisheries descriptions (Table 1).

Table 1**:** Characteristics of the Trinidad and Tobago fisheries

Fishery	**Soft-substrate demersal (shrimp and groundfish) fishery**
Local range	Trinidad
Species targeted	Shrimp: *Litopenaeus schmitti, Farfantepenaeus subtilis, F. notialis, F. brasiliensis, Xiphopenaeus kroyeri*
Other commercial resources	Groundfish: sciaenids (*Cynoscion jamaicensis, C. acoupa, Macrodon ancylodon, Micropogonias furnieri*); clupeids; gerreids (*Diapterus* spp.); lutjanids (*Lutjanus* spp., *Rhomboplites aurorubens*); engraulids; haemulids (*Haemulon* spp., *Genyatremus luteus, Orthopristis* spp.); ariids (*Bagre* spp., *Arius* spp.)
Seasonality	Generally, shrimp landings and catch rates are higher in the dry season (January – June)
Status of the resources	*F. subtilis* (1973-2001): resource is severely overfished and overfishing has been taking place since the 1970s; fishing mortality estimated to be more than three times greater than Fmsy and the biomass less than one quarter (23%) of Bmsy *L. schmitti* and *F. subtilis* (1990-1991): fully to overfished *F. notialis* [female stock] (1992-2001): catch is predominantly very young, small shrimp. *Xiphopenaeus kroyeri* (1992-2002): full to over exploitation. All species of shrimp (1988-2004, data from Trinidad and Tobago and Venezuela) : overfished; MSY in the region = 1700t.

	Cynoscion jamaicensis and *Micropogonias furnieri* (1987-1998): level of effort exceeds the levels at which yields of both species are maximized; MSY for *M. furnieri* was exceeded from 1987-1994 and in 1998. *Lutjanus synagr*is: (1980-1981) may be fully to over-exploited; (1963, 1975, 1995-2004, reconstructed CPUE 1908 to present) high fishing mortality but relatively constant CPUE trend over time and rarity of large animals in catch suggesting a constant recruitment and/or an emigration out of the fishing area.
Marketing	Shrimp sold locally and exported. Since 1995 exports have declined mainly due to non-competitive prices in the US, exclusion from the EU market and an increase in local sales with growth in the national economy. Groundfish sold locally and exported. Sold mainly in rural areas within the trawl fishing community and utilized in national school feeding programme. Small quantity exported to niche markets in North America.
Value	In 2004, the entire trawl fleet landed an estimated 799t of shrimp valued at US$2.97m and 815t of groundfish bycatch valued at US$0.6m. In 2003, shrimp exports were estimated at 119t with a value of US $0.8m.
Fleet/gear	*Shrimp*: trawl (artisanal, semi-industrial, industrial); artisanal multi-gear Trinidad (beach/land seine). *Groundfish*: artisanal multi-gear Trinidad (bank line, gillnet, demersal longline); trawl (artisanal, semi-industrial, industrial)
Statistical sampling	Trawl fleet, artisanal multi-gear fleet Trinidad

Fishery	**Hard-substrate demersal fishery**
Local range	Trinidad and Tobago
Species targeted	Snappers: *Lutjanus synagris*, *L. purpureus*, *Rhomboplites aurorubens*; groupers: *Epinehelus* spp., *Mycterperca* spp.
Other commercial resources	Snappers : *L. griseus, L. jocu, L. vivanus* ; lobsters: *Panuliris* spp.; grunts: *Haemulon* spp.
Seasonality	Not known
Status of the resources	*L. purpureus* (1990 - 1991): fully exploited *R. aurorubens* (1990 - 1991): overfished
Marketing	Snappers and groupers exported
Value	Not available
Fleet/gear	Artisanal and semi-industrial multi-gear [Trinidad, Tobago] (fishpots, bank lines and other demersal lines); recreational [Trinidad, Tobago]
Statistical sampling	Artisanal multi-gear fleet Trinidad, recreational fleets at tournaments only

Fishery	**Coastal pelagic fishery**
Local range	Trinidad and Tobago
Species targeted	*Scomberomorus brasiliensis*, *S. cavalla*, *Hirundichthys affinis*, *Acanthocybium solandri*, *Coryphaena hippurus*
Other commercial resources	*Caranx hippos, C. crysos*; Sharks: *Sphyrna tudes, Rhizoprionodon lalandii, Carcharhinus porosus*, *C. limbatus*; Small coastal pelagics (SCPs): clupeidae; engraulidae; carangidae; belonidae; hemiramphidae; juveniles of

	carangidae, scombridae, pomatomidae, sphyraenidae
Seasonality	*S. brasiliensis*: December - April; *H. affinis*: November - July; *S. cavalla* targeted with availability of bait.
Status of the resources	*S. brasiliensis* (1991-1992) and *S. cavalla* (1987): fully exploited; *H. affinis* (1991): high level of exploitation
Marketing	Most landings sold locally. Catches of SCPs from beach seines and bait seines utilised locally either as food or bait. Flyingfish, dolphinfish, clupeids and possibly engraulids exported.
Value	*S. cavalla* ex-vessel value (2006) ~ TT$10m
Fleet/gear	Artisanal multi-gear [Trinidad, Tobago] (gillnet, trolling, a-la-vive, switchering, beach/land seine, Italian/purse seine, tuck seine, bait seine); semi-industrial multi-gear [Trinidad, Tobago]; semi-industrial longline; recreational [Trinidad, Tobago]; trawl
Statistical sampling	Artisanal multi-gear fleet Trinidad, semi-industrial longline, recreational fleets at tournaments only

Fishery	**Oceanic or Highly Migratory Pelagic Fishery**
Local range	Trinidad and Tobago
Species targeted	*Thunnus albacares*, *T. obesus*, *Xiphias gladius*, *T. alalunga*, *Katsuwonus pelamis*, *Sarda sarda*, *Acanthocybium solandri*, *Coryphaena hippurus*
Other commercial resources	*T. atlanticus*, *Auxis thazard*, *Euthynnus alletteratus*, *Makaira nigricans*, *Tetrapturus albidus*, *Istiophorus platypterus* (formerly *I. albicans*), sharks
Seasonality	Local information not available
Status of the resources	Local information not available
Marketing	Majority of yellowfin tuna, bigeye tuna and swordfish are exported
Value	Ex-vessel value of Trinidad component: US$4.5m (TT$28.3m) in 2007. Steady increase from US$1.5m (TT$9.7m) in 2002.
Fleet/gear	Semi-industrial longline; semi-industrial multi-gear [Trinidad, Tobago]; artisanal multi-gear [Trinidad, Tobago]; recreational [Trinidad, Tobago]
Statistical sampling	Semi-industrial longline Trinidad, artisanal multi-gear Trinidad, recreational fleets at tournaments only

3.0 Description of the Fleets

Several fleets operate utilizing a number of fishing gears and methods (Table 2).

1,153 vessels were recorded during the 2003 fishing vessel census for Trinidad; about 96% were artisanal (including trawlers), about 2% were semi-industrial multi-gear vessels and 1% were semi-industrial longliners. The number of longliners however, has doubled since 2004. The trawl fleet (artisanal, semi-industrial and industrial vessels) made up about 13% of the vessels. Many artisanal fishers switch gear depending on the prevailing circumstances or at times operate more than one gear at the same time.

There are an estimated 306 vessels in the commercial fleet that operates out of Tobago with 97% being artisanal and the rest, semi-industrial multi-gear vessels.

In 1998 there were about 1570 commercial fishing vessels in the national fleet of which 95% were artisanal.

Table 2: Trinidad and Tobago fleet characteristics

Fleet	**Artisanal multi-gear (Trinidad)**
Vessel	Pirogues; 7 - 12m; 2 outboard engines usually 45 - 75Hp each
Gear	Gillnets (monofilament, multifilament); pelagic lines (a-la-vive, trolling, towing, switchering); demersal lines (banking, palangue); fishpot; seines (beach, bait, Italian, tuck); diving, spearfishing.
# vessels	~ 1107
Fleet operations	Manual; year round; day fishing; territorial waters of T&T
Species targeted	*Scomberomorus brasiliensis*, *S. cavalla*. Several species of groundfish and sharks form important bycatches of this fleet.
Appropriate units of effort	No. of trips
Statistical sampling	Collection of landings and fishing effort data instituted in the mid-1950s. The early system focused on 2 major fish markets at Port of Spain and San Fernando. Currently catch and effort data collected at 20 of 65 landing sites around Trinidad. Each enumerated site is considered representative of fishing in one of the 9 statistical sampling regions. Each month data are recorded for 20 randomly selected days at each site. Where possible, a complete census of landings is taken on the selected days.

Fleet	**Artisanal trawl (Trinidad)**
Vessel	Pirogues; 7 - 12m; 2 outboard engines usually 45 - 75Hp each or one 90 -150Hp inboard diesel engine; no on-board storage facilities and electronic equipment
Gear	Trawl net
# vessels	102
Fleet operations	Manual; year round; day fishing in Gulf of Paria; depth 1.8 - 18.0m in an estimated area of 607sq km
Species targeted	Shrimp: *Litopenaeus schmitti, Farfantepenaeus subtilis, F. notialis, F. brasiliensis, Xiphopenaeus kroyeri.* Bycatch of groundfish: sciaenids (*Cynoscion* spp., *Macrodon ancylodon, Micropogonias furnieri*); gerreids (*Diapterus* spp.); lutjanids (*Lutjanus* spp., *Rhomboplites aurorubens*); haemulids (*Haemulon* spp., *Genyatremus luteus, Orthopristis* spp.)
Appropriate units of effort	No. of trips, no. of hours at sea, no. of hauls.
Statistical sampling	Collection of landings and fishing effort data instituted in 1959 and focused on 2 major fish markets at Port of Spain and San Fernando. Currently catch and effort data collected at the three main landing sites of the fleet. Estimated fleet coverage: 75%

Fleet	**Semi-industrial longline (Trinidad)**
Vessel	Longliner; 14 - 23m; 160 - 400Hp inboard diesel engine; electronic fish finding aids, navigation equipment, communication equipment, fish/ice hold (4 - 9t)
Gear	Pelagic longline
# vessels	In 2007, out of a total of 20 vessels, 19 vessels fished. There was an increase over the number of vessels reported to ICCAT for 2006 which was 17. The fleet has

	doubled in size since 2004 when 10 vessels were reported.
Fleet operations	Mechanised; year round; T&T EEZ, Caribbean Sea, Eastern Caribbean, North Atlantic; avg trip length = 18 days; avg no. of fishing days = 13
Species targeted	*Thunnus albacares*, *T. obesus*, *Xiphias gladius*. Bycatch of tunas, billfishes and sharks.
Appropriate units of effort	No. of hooks, no. of sets
Statistical sampling	Trip reporting system gives data coverage of ~ 80+ %. This system is considered the forerunner of a log book system.

Fleet	**Semi-industrial multi-gear (Trinidad)**
Vessel	14 - 23m; single inboard diesel engine 165Hp; electronic fish finding aids, navigation equipment, communication equipment,
Gear	Palangue, fishpot, demersal longline, a-la-vive
# vessels	~ 23
Fleet operations	Mechanised; T&T EEZ (north and east coasts); avg trip length = 8 days
Species targeted	*S. cavalla*, snappers
Appropriate units of effort	-
Statistical sampling	No systematic sampling of this fleet.

Fleet	**Semi-industrial trawl (Trinidad)**
Vessel	Trawler; 9.3 - 13.1m; 165 – 174Hp inboard diesel engine; electronic fishing aids, communication equipment, fish/ice hold.
Gear	Single trawl net, average headrope length 12.9m
# vessels	10
Fleet operations	Mechanised; year round; Gulf of Paria; depth of 9.0 - 41.4m within an estimated area of 1,793sq km; trawl both day and night.
Species targeted	Shrimp*:Litopenaeus schmitti, Farfantepenaeus subtilis, F. notialis, F. brasiliensis, Xiphopenaeus kroyeri.* Bycatch of groundfish: sciaenids (*Cynoscion* spp., *Macrodon ancylodon, Micropogonias furnieri*); gerreids (*Diapterus* spp.); lutjanids (*Lutjanus* spp., *Rhomboplites aurorubens*); haemulids (*Haemulon* spp., *Genyatremus luteus, Orthopristis* spp.)
Appropriate units of effort	No. of days at sea, no. of trips, no. of hours at sea, no. of hauls
Statistical sampling	Collection of daily landings and fishing effort data at the main landing site. Data collected since the fleet started operations in the mid-1980s. Estimated fleet coverage: 75%

Fleet	**Industrial trawl (Trinidad)**
Vessel	Trawlers; 10.9 - 23.6m; 365 - 425Hp inboard diesel engine; 30 – 96t GRT; electronic fishing aids, communication equipment, fish/ice hold.
Gear	Two outriggers each towing one trawl net on either side of the vessel, average head rope length 12.9m.
# vessels	20 - 25
Fleet operations	Mechanised; year round; trawl both day and night; Columbus Channel: trawl at depth 18.0 - 41.4m and cover 1,740sq km; Gulf of Paria: trawl at depth 9.0 - 48.6m over an area of 1,269sq km

	North Coast: trawl at depth 37.8 - 57.6m in limited area of 184sq km.
Species targeted	Shrimp: *Litopenaeus schmitti, Farfantepenaeus subtilis, F. notialis, F. brasiliensis, Xiphopenaeus kroyeri.* Bycatch of groundfish: sciaenids (*Cynoscion* spp., *Macrodon ancylodon, Micropogonias furnieri*); gerreids (*Diapterus* spp.); lutjanids (*Lutjanus* spp., *Rhomboplites aurorubens*); haemulids (*Haemulon* spp., *Genyatremus luteus, Orthopristis* spp.)
Appropriate units of effort	No. of days at sea, no. of trips, no. of hours at sea, no. of hauls
Statistical sampling	Catch and effort data collection began in 1995; data collected at the two main landing sites. Currently data collected at one major landing site and three minor sites. A logbook system was introduced in 1991and ended after May 1992. Estimated fleet coverage: 75%

Fleet	**Recreational (Trinidad)**
Vessel	Power boats 6 - 8m, pirogues 9 - 11m, cabin cruisers 10 - 11m; some vessels with electronic fish finding aids, navigation equipment, communication equipment; bail wells
Gear	A-la-vive, trolling, banking, rod and reel, spear fishing; (small proportion use fishpot, gillnet, palangue)
# vessels	307 (1993 survey of the northwest peninsula); a large proportion of which were registered as commercial fishing vessels
Fleet operations	Some manual, some mechanised; year round; T&T EEZ; some part time commercial fishing (i.e. catch is sold), some fishing for leisure (catch not sold), at least 5 tournaments held annually
Species targeted	Demersal and pelagic finfishes
Appropriate units of effort	-
Statistical sampling	Catch and effort data collected at tournaments

Fleet	**Artisanal multi-gear (Tobago)**
Vessel	Pirogue (Note: bumboat is also used; for beach seines) 7 - 10m
Gear	Gillnet, driftline, trolling, a-la-vive, beach/land seine, banking, bottom longline, diving, spearfishing
# vessels	297 pirogues
Fleet operations	Manual; year round; day fishing; territorial waters of T&T
Species targeted	*Thunnus albacares*, *T. alalunga*, *Katsuwonus pelamis*, *Sarda sarda*, *Hirundichthys affinis*, *Acanthocybium solandri*, *Coryphaena hippurus*
Appropriate units of effort	-
Statistical sampling	Ad-hoc collection of landings data began in the early 1970s in Tobago. In 1988 the system was regularized but focused only on the component of the fleet that targeted flyingfish, at three landings sites. The system was modified in 1995 to include all components of the coastal fisheries through monthly random sampling at eight of the 45 landing sites around the island. The system is hampered by human and financial limitations.

Fleet	**Semi-industrial multi-gear (Tobago)**
Vessel	8 - 14m; inboard diesel engine 75 - 335Hp; ice hold
Gear	Monofilament gillnet, pelagic line
# vessels	9
Fleet operations	Mechanised; year round; T&T EEZ (western and northwestern coasts of Tobago); avg. trip length = 5 days
Species targeted	*Thunnus albacares*, *T. alalunga*, *Katsuwonus pelamis*, *Sarda sarda*, *Hirundichthys affinis*, *Acanthocybium solandri*, *Coryphaena hippurus*
Appropriate units of effort	-
Statistical sampling	Ad-hoc collection of landings data began in the early 1970s in Tobago. In 1988 the system was regularized but focused only on the component of the fleet that targeted flyingfish at three landings sites. The system was modified in 1995 to include all components of the coastal fisheries through monthly random sampling at eight of the 45 landing sites around the island. The system is hampered by human and financial limitations.

Fleet	**Recreational (Tobago)**
Vessel	Not available
Gear	Not available
# vessels	Not available
Fleet operations	At least 2 tournaments annually
Species targeted	Migratory and coastal pelagics
Appropriate units of effort	-
Statistical sampling	Catch and effort data collected at tournaments

4.0 National Fisheries Policy & Management Objectives

A new Draft Policy for the Fisheries Sector of Trinidad and Tobago was completed in June 2007 and is awaiting formal adoption by the Cabinet. The general policy objective is to maintain a cost effective fisheries management structure in pursuit of the goal of ensuring that the exploitation of the fisheries resources and the conduct of related activities, are consistent with ecological sustainability (e.g. of target species, non-target species, and marine environments). Government's policy is to move from an open access regime to one of a limited entry regime in order to alleviate overcapitalization and overexploitation across all fishing fleets. Policies relating to the main fleets are presented in Table 3. The policy also considers the socio-economic implications of management measures for fisherfolk.

Table 3: Management policy related to fishing fleet (as outlined in the Draft Policy Document 2007).

Fishing Fleet	Management Policy
Artisanal multi-gear	Phased introduction of an increased stretched mesh size for gillnets. Promotion of line fishing as a more sustainable fishing method over gillnetting.
Trawl (artisanal, semi-industrial, industrial)	Alleviate the negative impact of trawling through the introduction of more environmentally friendly trawl gear. Favour the introduction of BRDs that will reduce discards by up to

	50% Ensure that fish trawling is conducted with an appropriate net.
Semi-industrial longline	Increase the availability of live bait for the line fishery
Semi-industrial multi-gear	Alleviate the negative impact of fish pots through the introduction of more environmentally friendly fish pots.
Recreational	Ensure that facilities which are available specifically for commercial fishermen are not accessed for recreation and that a regulatory framework for recreational fishing is provided.

5.0 Data Collection & Research

The biological sampling programmes for five target species of penaeid shrimp and two species of groundfish (*L. synagris* and *M. furnieri*) - landed as bycatch - in the trawl fishery and for the pelagic species *S. brasiliensis*, *S. cavalla* and *C. hippos* were suspended in early 2008 due to a critical shortage of staff (including supervisory staff).

Gear trials were conducted in the artisanal trawl fleet in October and November 2007. These trials involved modifying the existing trawl net, testing of two bycatch reduction devices (BRDs) namely the fisheye and square mesh panel, and testing of a new monofilament artisanal shrimp trawl net received from the National Fisheries Institute, Mexico. These gear trials followed on previous work completed in November 2006 and May 2007. Overall results are insufficient to determine the effectiveness of each BRD in reducing discards. Modifications to the existing net and the new monofilament net however showed favourable results with regard to making fishing operations more efficient in terms of fuel consumption and gear handling. Joint gear testing between the Fisheries Department and the fishing industry has been beneficial in educating fishers and promoting co-management of the trawl fishery. These gear trials collectively represented one of the project activities for Trinidad and Tobago under the FAO global Project EP/GLO/201/GEF *"Reduction of Environmental Impact from Tropical Shrimp Trawling, through the Implementation of Bycatch Reduction Technologies and Change of Management"*. This project seeks to reduce the negative environmental aspects of bottom trawling through the removal of barriers to the introduction of environmentally friendly gear and fishing practices. This five-year project officially ends in September 2008.

Under the FAO global Project EP/GLO/201/GEF, the Fisheries Division, in collaboration with the University of the West Indies (UWI), St Augustine campus, completed a study on the social and economic importance of bycatch in the trawl fishery industry and the communities supported by the industry. The study was based on a formal Rapid Appraisal Household Survey of a randomly selected representative sample of the households within the Orange Valley and Otaheite trawl fishing communities in 2005 which was followed by interviews of fishers and processors in 2005 and 2006. The results of the study estimated the annual value of the bycatch landed by the shrimp fishers in Orange Valley and Otaheite to be $695,641.52. The study recommends that policies that may be implemented to reduce bycatch in the shrimp fishery must recognize the social and economic importance of the bycatch on the livelihoods of many in the local communities in addition to the bycatch being a cheap source of protein.

A desktop study on the effects of pollution on the fisheries resources was completed in 2007. The study was commissioned by the Fisheries Division based on stakeholder recommendations made at the April 2005 bilateral assessment workshop held between Trinidad and Tobago and Venezuela under the auspices of the WECAFC ad hoc Working Group on Shrimp and Groundfish, and conducted by the UWI, St. Augustine. The study focused on issues related to

pollution and habitat destruction as a result of human activities in the coastal zones of the Gulf of Paria and the Colombus Channel. These coastal zones are bordered by Trinidad and Tobago and Venezuela and are also main fishing areas exploited by trawl and other fishing fleets of both countries.

Trinidad and Tobago contributed to the regional project FAO Project GCP/RLA/140 JPN "*Scientific Basis for Ecosystem Based Management in the Lesser Antilles including Interaction with Marine Mammals and other Top Predators*" (also known as the LAPE Project). The project, which was initiated in September 2002, is currently in the process of publishing its reports. Its major output is an information system consisting principally of ecosystem models and Geographic Information System models of the Lesser Antilles. Inputs to the system have been accumulated from existing data and information and through fisheries surveys (to determine biomass distribution and diet composition of selected pelagic species). The models focus on pelagic species of importance to the fisheries of the region, other top predators in the ecosystem including cetaceans and other major components of the pelagic food web. They were used, with other supporting information, to study the possible impacts of different ecosystem-based fishery management strategies for the fisheries of the region.

Trinidad and Tobago initiated work on the testing of *ParFish*. In May 2008, Consultant Dr. Paul Medley trained Fisheries Division staff in the conducting of the stock assessment and preference interviews. The demersal shrimp trawl fishery was selected for the study. To date, about 25 stock assessment and 25 preference interviews have been conducted. Analysis of the information gathered has been scheduled for late 2008.

Additionally, the Fisheries Division is currently collaborating with the Institute of Marine Affairs (IMA) on ageing studies of *S. brasiliensis*. The Division is also in the process of digitising its historical records of catch and effort which date back to the 1950's. The project involves the scanning and computerisation of the paper records.

6.0 Legislation & Management Regulations

The principal legislation governing domestic fishing in Trinidad and Tobago is the *Fisheries Act 1916* and the subsequent 1966 and 1975 amendments. The Act empowers the Minister responsible for fisheries to make regulations to prescribe mesh size of nets; to restrict the size of fish, shrimp, crabs and turtles caught, and prohibit their sale or prevent the catching of these species either absolutely or by season or area.

A Draft Act to repeal the *Fisheries Act 1916* and draft regulations were completed in 2006. The Act will provide for the preparation and revision of fishery management plans and the control of access to fishery resources through the establishment of licensing systems for both local and foreign fishing vessels. Draft fisheries management plans were developed in the 1990's with the assistance of the FAO and under CFRAMP.

The *Fishing Industry (Assistance) Act, 1955*, makes provisions for the granting of financial assistance to the fishing industry by such means as fuel rebates, tax waivers and subsidies on fishing equipment.

The *Marine Areas (Preservation and Enhancement) Act, 1970*, provides for the designation of restricted areas. The Act is currently applied only to the management of coral reefs.

The *Archipelagic Waters and Exclusive Economic Zone Act of 1986* provides for the declaration of archipelagic waters and the establishment of a 200-mile exclusive economic zone (EEZ), and governs access to these waters by foreign fishing vessels.

Related legislation includes the *Fish and Fishery Products Regulations, 1998* under Section 25 of the *Food and Drugs Act Chapter 30:01* which authorizes the Minister with responsibility for health to grant licences for the import and export of fish which have been handled and packed under conditions conforming to health and safety standards prescribed under the Act.

A Memorandum of Agreement has been signed between the Fisheries Division and the company which operates the transshipment port located in Port of Spain. The MOA requires the transshipment port to submit information (e.g. on fleet and catch information) to the Division at regular intervals and provides for the inspection of the port facilities, vessels and catches by the Division.

A Fisheries Monitoring Surveillance and Enforcement Unit (FMSEU) was established in the Fisheries Division in June 2004. The FMSEU conducts site visits to fish landing sites and at-sea surveys to ensure compliance with fisheries regulations and to enforce them where necessary. The Unit also inspects processing plants and vessels and export-bound shipments at the various ports including the transshipment ports.

There are two Cabinet-appointed committees which advise on the management of fisheries. One has responsibility for domestic fisheries, the other for matters relating to the activities of foreign fishing entities.

APPENDIX 1

Major marine fish and shrimp species exploited commercially in Trinidad and Tobago

FAMILY	NUMBER OF SPECIES	COMMON NAME	MAIN SPECIES EXPLOITED
Ariidae	15	catfish	*Arius spp., Bagre spp*.
Carangidae	33	cavalli	*Caranx spp., Trachinotus spp., Seriola spp., Decapterus spp., Selene spp*.
Carcharhinidae	19	shark	*Carcharhinus spp., Rhizoprionodon spp*.
Centropomidae	6	snook, brochet	*Centropomus spp*.
Clupeidae	18	herring	*Opisthonema oglinum, Harengula spp., Sardinella spp*.
Coryphaenidae	2	dolphinfish	*Coryphaena hippurus*
Exocoetidae	7	flyingfish	*Hirundichthys affinis, Cheilopogon spp., Cypselurus spp*.
Gerreidae	12	blinch	*Diapterus spp*.
Haemulidae	27	grunt	*Haemulon spp., Anisotremus spp., Genyatremus luteus*
Lutjanidae	19	snapper	*Lutjanus spp., Rhomboplites aurorubens, Etelis oculatus*
Mugilidae	9	mullet	*Mugil spp*.
Penaeidae	13	shrimp	*Farfantepenaeus subtilis, F. notialis, Litopenaeus schmitti, F. brasiliensis, Xiphopenaeus kroyeri*
Pomatomidae	1	ancho	*Pomatomus saltator*
Sciaenidae	45	salmon	*Cynoscion spp., Macrodon ancylodon, Micropogonias furnieri*
Scombridae	15	mackerel, tuna	*Thunnus spp., Scomberomorus brasiliensis, S. cavalla, Acanthocybium solandri, Euthynnus alletteratus*
Serranidae	57	grouper	*Epinephelus spp., Mycteroperca spp., Cephalopholis spp*.
Sphyraenidae	4	barracuda	*Sphyraena spp*.
Sphyrnidae	5	shark	*Sphyrna spp*.
Trichiuridae	3	cutlassfish	*Trichiurus lepturus*
Xiphiidae	1	swordfish	*Xiphias gladius*

APPENDIX 2

Primary gear type by vessel as recorded in fishing vessel censuses held in Trinidad in 1991, 1998 and 2003.

PRIMARY GEAR TYPE	# VESSELS		
	1991	1998	2003
Multifilament gillnet	216	195	174
Monofilament gillnet	163	133	172
Joined multi/monofilament		2	
A-la-vive		44	114
Trawl	186	114	98
Banking		156	80

PRIMARY GEAR TYPE	# VESSELS		
	1991	**1998**	**2003**
Trolling/Towing		47	53
Palangue		40	46
Fishpot		63	38
Switchering		17	21
Beach/Land seine	25	18	12
Italian seine	20	12	7
Bait seine		5	
Longline		4	11
Spearfishing		1	
Other			11
Unknown		399	
Total	**610**	**1251**	**837**

TURKS AND CAICOS ISLANDS NATIONAL REPORT 2007/2008

By: Kathy Lockhart
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1.0 Introduction

The Turks and Caicos Islands (TCI) fisheries have been viewed as small in comparison to the Caribbean region. However, the TCI is and remains a strong leader in its collection of fisheries data with regards to both the Spiny Lobster and Queen Conch. Within the last few years, the TCI has been collecting information with regards to scale fish or "reef fish". With an increase in tourism, the TCI expects to have an increase in the consumption of scale fish and has thus been collecting information for assessment.

In terms of export earnings the most valuable industry is the marine fisheries including queen conch (*Strombus gigas*) and spiny lobster (*Panulirus argus*). Scale fish is not captured for the purpose of export, but instead for the local consumption through restaurants and hotels. The problem with scale fish is that all of the catch is not landed at licensed processors. There is a "back door" for the sale of scale fish to the local economy. The TCI has taken the direction within its Management Plan to diversify its fisheries including scale fish, which is assumed to be under utilized. With this in mind, the TCI is attempting to be proactive in the collection of data on scale fish. With the collection of data, the TCI can then recommend regulations for the protection of the various species, while still allowing for the diversification into the fishery.

2.0 Description of Fisheries and Fleet

The Turks and Caicos Islands base commercial fishing on the shallow water banks, primarily the Caicos Bank and the Turks Bank. The Mouchoir Bank is considered within the territorial water of the TCI, but used mainly for the purpose of capture of scale fish. The vessels most often utilized in the TCI are small retrofitted V-hull boats ranging in length from 18 ft-20 ft with a 85-115 hp out board engines. Three trap boats collect lobster and scale fish, while three other vessels are utilized specifically for landing of scale fish with banned reels (i.e. grouper and red fish).

Commercial fishermen from the TCI often work more than one fishery at a time. Using only free diving methods with no underwater breather apparatus, fishers are found diving in depths ranging from 3 meters to 30 meters. The normal day for a fisher entails leaving the dock between 7:00 and 8:00 a.m. and return between 4:00 and 5:00 pm, considered 1 boat-day. Commercial fishermen are found to be opportunistic in their catch. During the open season of lobster, fishermen largely capture spiny lobster and land them whole. Near the end of the lobster season (around February or March), the fishermen re-prioritize capture and start landing queen conch, landed whole

without shell. In the past few years, fishers have increased their catch of scale fish for the local markets. The larger boats with the banned reels have now established the local market for its catch and increased its harvest.

Within the past ten years, the commercial fisheries have directly employed an average of 377 fishers per year. In 2007/2008 fishing season, the number of commercially licensed persons was at 388. Similarly the number of commercially licensed vessels average at 154 licensed vessels but in 2007-2008 there were 152 commercially licensed vessels.

When referring to the catch of scale fish, effort is measured by the number of days at sea. The larger individual boats carry between 5-12 men on the vessel each day. Smaller vessels carry between 1-3 people on board.

3.0 National Fisheries Policy and Management Objectives

3.1 Policy Summary

Although protection of fisheries resources is implicit in the overall development strategy of the TCI, the importance of the fisheries sector in present and future development and the fragility of the resource base warrant the establishment of a specific policy for the industry.

The Fisheries Policy aims to ensure the sustainable use of the living marine resources and ecosystems through increased cooperation and collaboration with all the stakeholders for the improved welfare of the people of the TCI. It is founded on the belief that all natural marine living resources of the TCI, as well as the environment in which they exist and in which mariculture/aquaculture activities may occur, are national assets and the heritage of all the people, and should be managed and developed for the benefit of present and future generations in the country.

The long-term vision of the Government of the TCI includes:

- Pursuance of well-informed strategic, economic and financial policies, which promote sustainable development and a decent standard of living for the people of the TCI.
- Achievement of greater functional and geographical diversification of economic activity, so as to reduce the TCI's economic vulnerability and to spread the benefits of economic growth more widely among its inhabitants.
- Implementation of policies and strategies to protect the interest of the TCI Islanders, thereby empowering them to derive optimum benefits from the development of the TCI.
- Initiation of measures contributing to the fusion of a dignified and confident nation at peace with itself and the world, a nation whose people believe in themselves and who, in their entrepreneurial, professional and other daily pursuits, and energized by dignity and national pride.
- Provision of sound health and educational services, which are available to all.
- To use our natural resources wisely, being fair to present and future generations.

3.2 Management Objectives:

❒ Promote sustainable development of the fin-fish fisheries resources by adopting cautious conservation and management measures in conjunction with the 'Guidelines on the precautionary principle' (FAO *Technical guidelines for Responsible Fisheries.* No.2. Rome, FAO. 1996)	
Commercially Exploited Fin-fish Fishery	❒ Maintain high stock levels ❒ Improve our understanding and knowledge of the stocks ❒ Develop management guidelines for the conservation and sustainable exploitation of the fishery
Under-exploited Fin-fish Fishery	❒ Promote sustainable development/exploitation of these resources ❒ Determine the Maximum Sustainable Yield limit ❒ Establish reference points for the management of the resources
Subsistence Fin-fish Fishery	❒ Promote sustainable development/exploitation of these resources
Under-Consumed Fin-fish Fishery	❒ Promote sustainable development/exploitation of these resources ❒ Remove the taboo associated with the non-consumption of these resources by public education and promotion
Non-extractive Fin-fish Fishery (Sport Fishing)	❒ Continue to promote the non-extractive utilisation of these resources

4.0 Research

4.1 Monitoring Activities:

- Catch and effort data for scale fish is being collected at the landing docks and processing facilities. Fish are measured by standard length, fork length and total length and reported with species name. A weight is collected if time allows. Captains are then interviewed for the number of days at sea, number of crew, location, etc.
- Export data for fish is collected for personal export only. Scale fish is not exported on a commercial scale.

- The Department of Environment and Coastal Resources (Fisheries Sub-unit) has collected local consumption data of marine products to determine the seafood consumption rate. The data is available but not completely analyzed.
- Data on large and coastal pelagic are collected during local fishing tournaments. This data is stored and shared with international monitoring organizations such as ICCAT and the FAO.
- Catch data from confiscated international vessels poaching in the waters of the Turks and Caicos Islands are also monitored. These vessels usually fish on the Mouchoir Bank, and in waters which local fishers do not utilise except in the case of scale fish. By monitoring the catches from these vessels, the Department anticipates the use of these data to assess the status of the fish stocks in these areas.
- The Department is also actively monitoring the number of persons, number and sizes of vessels, sizes of engines, and gear types being used in each fishery through the licensing system so as to determine "effective effort" exerted on the respective fisheries.
- Although the Department have conducted numerous socio-economic surveys in the past, this research approach for the most part has been underutilised. Many of the socio-economic surveys have been in collaboration with individuals and or institutions, looking at the following:
    - Social Capital
    - Resource utilisation
    - Local consumption

5.0 Legislation and Management Regulations

- Fisheries Protection Ordinance. Cap. 104: This is the main legislation which provides the legal basis and regulations for managing the fishery resources of the Turks and Caicos Islands. (Strongest Legislation based for monitoring, enforcement and surveillance).

5.1 Other Fisheries Related Legislation

- Fishery Limit. Cap. 105: Defines the Territorial Waters and Economic Exclusion Zones (EEZ) of the Turks and Caicos Islands.
- National Park Ordinance. Cap. 80: Provides the legal basis for the establishment and management of marine protected areas such as National Parks, Marine Reserves, and Sanctuaries.
- Coastal Protection Ordinance: This legislation combines several pieces of legislations, such as the national parks ordinance, fisheries protection ordinance and others to provide protection for the coastal zone.
- Endangered Species Bill: This legislation is currently in draft form. On completion, it will provide the legal basis for protection of endangered species in the Turks and Caicos Islands. (Will provide the backing for monitoring of exports such as CITES)
- Wild Birds Protection Ordinance. Cap. 84: Allows for the management of ancillary species in order to protect biodiversity
- Mineral (Exploration and Exploitation) Ordinance. Cap. 79: Provides for the protection of the marine habitat from direct mining impacts or from indirect terrestrial mining activities.

List of Acronyms and Abbreviations

ARGOS	-	Advanced Research and Global Observation Satellite
BRD	-	Bycatch Reduction Devices
CARICOM	-	Caribbean Community
CFRAMP	-	CARICOM Fisheries Resource Assessment and Management Programme
CFTDI	-	Caribbean Fisheries Training and Development Institute
CITES	-	Convention on International Trade in Endangered Species
COP	-	Conference of Parties
CPUE	-	Catch Per Unit of Effort
CRFM	-	Caribbean Regional Fisheries Mechanism
DOF	-	Department of Fisheries
EEZ	-	Exclusive Economic Zone
EU	-	European Union
FAD	-	Fish Aggregating Device
FAO	-	Food and Agriculture Organization of the United Nations
FMSEU	-	Fisheries Monitoring Surveillance and Enforcement Unit
GATOSP	-	Guyana Association of Trawler Owners and Seafood Processors
GDP	-	Gross Domestic Product
GRP	-	Glass Reinforced Plastic
HACCP	-	Hazard Analysis and Critical Control Points
ICCAT	-	International Convention for the Conservation of Atlantic Tunas
IMA	-	Institute of Marine Affairs
JICA	-	Japan International Cooperation Agency
LAPE	-	Lesser Antilles Pelagic Ecosystem
MEY	-	Maximum Economic Yield
MOA	-	Memorandum of Agreement
MSY	-	Maximum Sustainable Yield
MT	-	Metric Tonne
OECS	-	Organization of Eastern Caribbean States
SCP	-	Small Coastal Pelagics
SFA	-	Special Framework of Assistance
SVG	-	St. Vincent and the Grenadines
T&T	-	Trinidad & Tobago
TED	-	Turtle Excluder Device
TCI	-	Turks and Caicos Islands
TIP	-	Trip Interview Program
UNCLOS	-	United Nations Convention on the Law of the Sea
US	-	United States
USA	-	United States of America
UWI	-	University of the West Indies
VMS	-	Vessel Monitoring System
WECAFC	-	Western Central Atlantic Fishery Commission