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## CRFM Fishery Report - 2012

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# VOLUME 1, Supplement 1

## National Reports

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Report of Eighth Annual Scientific Meeting -  
Kingstown, St. Vincent and the Grenadines  
20 - 30 June 2012

CRFM Secretariat, Belize  
2012

**CRFM Fishery Report – 2012  
Volume 1, Supplement 1**

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Report of Eighth Annual Scientific Meeting – Kingstown, St. Vincent and the  
Grenadines, 20 - 30 June 2012.

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## Foreword

The Eighth Annual Scientific Meeting took place during 20 – 30 June 2012 in Kingstown, St. Vincent and the Grenadines. During this Meeting, the five CRFM Resource Working Groups met. The CLWG completed a bio-economic assessment of the Jamaica queen conch fishery. The LPWG conducted several activities including: the evaluation of the status and availability of blackfin tuna data in the Eastern Caribbean; a preliminary assessment of the blackfin tuna fishery; and a review of the ERAEF methodology. Updates on the progress of the recreational fishery studies being conducted under the CLME project were also provided and the FAD deployment and research activities being coordinated by the MAGDELESA project were reviewed. The RSWG continued analysis of the Montserrat reef fishery data and conducted a preliminary analysis of the Jamaica reef fishery. The SCPWG reviewed the MCA study of the flyingfish fishery in the Eastern Caribbean as well as the activities of the first meeting of the joint CRFM / WECAFC Working Group on Flyingfish in the Eastern Caribbean. The main output of this joint working group was an updated the sub-regional fisheries management plan for the flyingfish fishery in the Eastern Caribbean and a resolution to be presented to the CRFM Ministerial Sub-Committee on flyingfish. The SGWG updated the Atlantic seabob assessments for Guyana and Suriname respectively.

The DMTWG completed training in methods focused on graphical techniques for data quality control and on graphical approaches to data analysis. A plenary session was held to review the 2011 – 2012 inter-sessional activities, discuss training needs and develop the workplan for the 2012 – 2013 period.

During the plenary session of the Eighth Annual Scientific Meeting, updates were provided on relevant collaborative activities / projects / programmes which included: the WECAFC joint-technical working groups; a website being developed by the University of Southern Mississippi to collect data on the *Sargassum* sp. event; lionfish studies being conducted by UWI / CERMES; the MAGDELESA project being coordinated by IFREMER; and the status of the Lionfish Action Plans at the national level.

The Report of the Eighth Annual Scientific Meeting is published in two Volumes: Volume 1 contains the report of the plenary sessions and the full reports of the CRFM Resource Working Groups for 2012. Eight national reports were submitted for consideration by the Meeting in 2012, and these are published as Supplement 1 to Volume 1. Volume 2 contains part A (Overview), and the fishery management advisory summaries of individual fishery reports comprising part B of each Working Group report, where relevant. 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.

The covers for this volume were designed and prepared by Mr. Shaun Young, while the photographs were provided by Mr. Derrick Theopille, Mr. Jullan Defoe, Mr. Fujii Motoki and Mr. Tetsuya Miyahara. These contributions are gratefully acknowledged.

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## List of Acronyms and Abbreviations

<b>ACP</b>	-	African, Caribbean and Pacific states
<b>BRD</b>	-	Bycatch Reduction Device
<b>CARIFIS</b>	-	Caribbean Fisheries Information System
<b>CERMES</b>	-	Centre for Resources Management and Environmental Studies
<b>CITES</b>	-	Convention on International Trade in Endangered Species
<b>CLME</b>	-	Caribbean Large Marine Ecosystem
<b>CLWG</b>	-	Conch and Lobster Resource Working Group
<b>CPUE</b>	-	Catch Per Unit Effort
<b>DMTWG</b>	-	Data, Methods and Training Working Group
<b>EEZ</b>	-	Exclusive Economic Zone
<b>ERAEF</b>	-	Ecological Risk Assessment for the Effects of Fishing
<b>EU</b>	-	European Union
<b>FAD</b>	-	Fish Aggregating Device
<b>FAO</b>	-	Food and Agriculture Organization of the United Nations
<b>FIC</b>	-	Fisheries Industry Census
<b>FMP</b>	-	Fisheries Management Plan
<b>FRP</b>	-	Fibre-reinforced plastic
<b>GDP</b>	-	Gross Domestic Product
<b>GPS</b>	-	Global Positioning Systems
<b>GTOSP</b>	-	Guyana Trawl Operators & Seafood Processors
<b>ICCAT</b>	-	International Commission for the Conservation of Atlantic Tuna
<b>IFREMER</b>	-	Institut Français de Recherche pour l'Exploitation de la Mer
<b>IUU</b>	-	Illegal, Unregulated and Unreported
<b>IJAPP</b>	-	Improving Jamaica's Agricultural Productivity Project
<b>JICA</b>	-	Japanese International Cooperation Agency
<b>LMP</b>	-	Lobster Management Project
<b>LPWG</b>	-	Large Pelagic Fish Resource Working Group
<b>MAGDELESA</b>	-	Moored Fish Aggregating Devices in the Lesser Antilles
<b>MCA</b>	-	Multiple Criteria Analysis
<b>MSC</b>	-	Marine Stewardship Council
<b>NAFCOOP</b>	-	National Association of Fisheries Cooperatives (Dominica)
<b>NEPA</b>	-	National Environmental Policy Act
<b>NGO</b>	-	Non-governmental Organization
<b>NKFM</b>	-	New Kingstown Fish Market
<b>OHB</b>	-	Old Harbour Bay
<b>OECS</b>	-	Organization of Eastern Caribbean States
<b>RFMO</b>	-	Regional Fisheries Management Organization
<b>RSWG</b>	-	Reef and Slope Fish Resource Working Group
<b>SCPWG</b>	-	Small Coastal Pelagic Fish Resource Working Group
<b>SGWG</b>	-	Shrimp and Groundfish Resource Working Group
<b>SIOJ</b>	-	Statistical Institute of Jamaica
<b>TAC</b>	-	Total Allowable Catch
<b>TED</b>	-	Turtle Excluder Device
<b>TIP</b>	-	Trip Interview Program
<b>UNCLOS</b>	-	United Nations Convention on the Law of the Sea
<b>UWI</b>	-	University of the West Indies
<b>VMS</b>	-	Vessel Monitoring System
<b>WECAFC</b>	-	Western Central Atlantic Fishery Commission

# **NATIONAL REPORT OF BELIZE**

*Prepared by: Mauro Gongora, MSc.  
Coordinator – Capture Fisheries Unit  
Belize Fisheries Department*

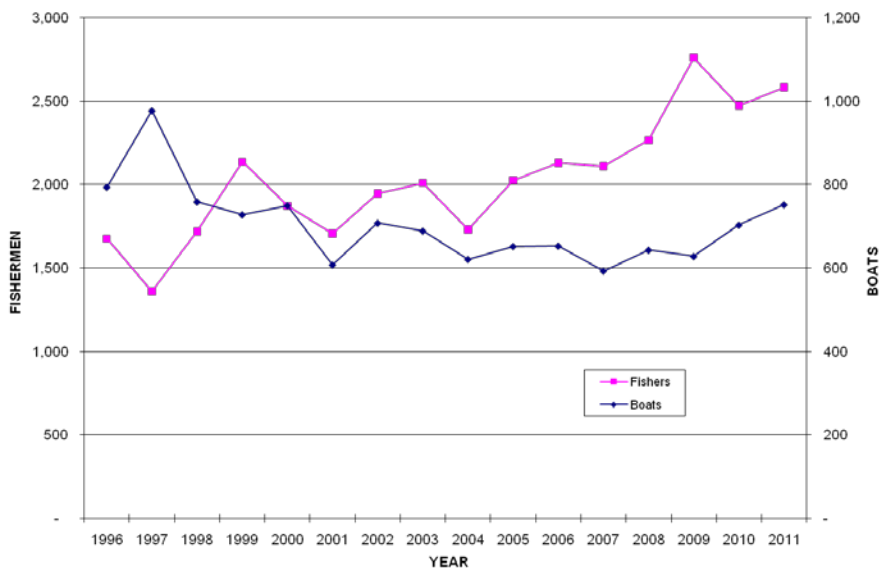
## **1. Fishery and fleet description**

Total fishery export earnings increased by 20% in 2011 from \$21.59 million in 2010 to 25.95 million in 2011. The main fishery commodities were Spiny lobster and Queen Conch. Lobster tail landings totalled 611,160 pounds (an increase of 22% compared to 2010), exports amounted to 557,320 lbs (an increase of 28.4% compared to 2010) and generated earnings of \$16.85 million (an increase of 29.7% compared to 2010). Conch meat catch landings totalled 856,424 pounds (increase of 21.4% compared to 2010), exports amounted to 791,350 lbs (increase of 8.9% compared to 2010), which generated earnings of \$8.18 million (increase of 2.4% compared to 2010).

The developing sea cucumber fishery was also a success as it employed 72 fishermen and nearly 75 tons of wet sea cucumber (49,833 pounds of dried sea cucumber) were produced and exported mainly to the United States of America. At an average price of \$3 per pound, this fishery generated local earnings amounting to one-half million dollars (\$500,000.00).

The crab fishery was also re-activated in 2011. The current production volume was estimated at over 2,000 pounds per month. Due to the success of the fishery, fishermen have asked for government assistance to identify regional markets due to the saturation of the local market and possible decreases in market prices in 2012. The objective of the program was to diversify the fishing industry, to create additional employment opportunities and improve the standard of living of fishermen.

Figure 1 show the increase in the number of fishermen over time, which amounted to 2,582 licensed fishers in 2011. The number of boats has remained relatively stable and there were 752 licensed fishing vessels in 2011.



**Figure 1. Number of fishermen and boats employed in the fishing industry during the period 1996 to 2011.**



## 2. Status of the main fisheries

### 2.1 Lobster fishery

The Spiny lobster (see Figure 2) was still Belize's most important fishery commodity and as was projected in our last report this year's total lobster tails landings increased by 22% (in 2010 landings increased by 7.7% and reached 500,650 lbs) totaling 611,160 pounds (see Figure 3).



*Figure 2. Freshly harvested Spiny lobster.*

Lobster tail exports also increased by 28.4% from 433,960 lbs in 2010 to 557,320 pounds in 2011. The export earnings increased significantly by 29.72% from \$12.98 million in 2010 to 16.85 million in 2011 (see Figure 4). The increase in export earnings is attributed mainly to the volume exported and not necessarily due to improved market prices in the United States of America where Belize's lobster tails is primarily exported. Conservatively, lobster export selling price was estimated at US\$15 per pound of lobster tails.

Lobster fishing continued as the most important fishing activity in 2011 and even though a declining trend in lobster catches was observed during the period 1999 to 2009 while fishing effort (assuming number of fishermen is taken as a measurement of fishing effort) had gradually increased; the catch landings for 2011 actually increased by 100,000 lbs. In general, lobster catch landings have remained relatively stable ranging between 400,000 – 600,000 lbs since 1986. Fisheries scientists strongly believe that the lobster stock has reached its Maximum Sustainable Yield and therefore the fishery cannot produce additional biomass despite the high fishing effort being applied. The slight increase in production in 2011 should therefore not be considered as growth of the population but rather a result of high fishing effort. No additional fishing effort is recommended for this fishery and real efforts are being made to control and/or reduce the number of fishermen involved in this fishery through the employment of a Managed Access program - a management tool currently employed at two pilot sites in Belize. The results of this project will help to determine whether the program could be extended to other marine protected areas and fishing sites.

In 2011, lobster head meat production amounted to 64,187 lbs and represented an increase of 19.6% in volume compared to last year but the income generated from exports amounted to only \$116,100 representing a decline of 65.4% (only 19,350 pounds of the total amount produced was exported). It is unknown whether the decline in lobster head meat is due to an overall higher demand at the national level in the tourism sector or if the fishermen cooperatives have stockpiled for sale in the future.

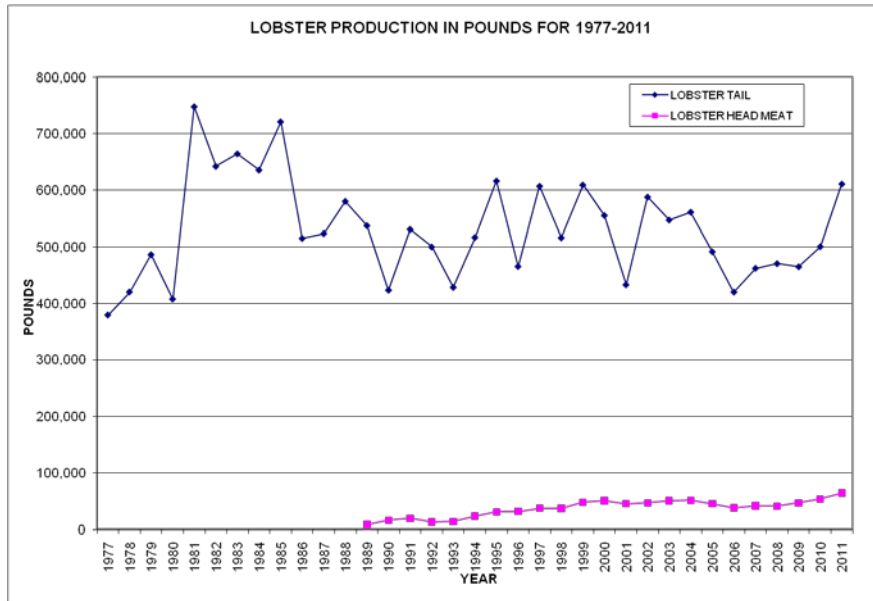


Figure 3. Lobster production performance during the period 1977 to 2011.

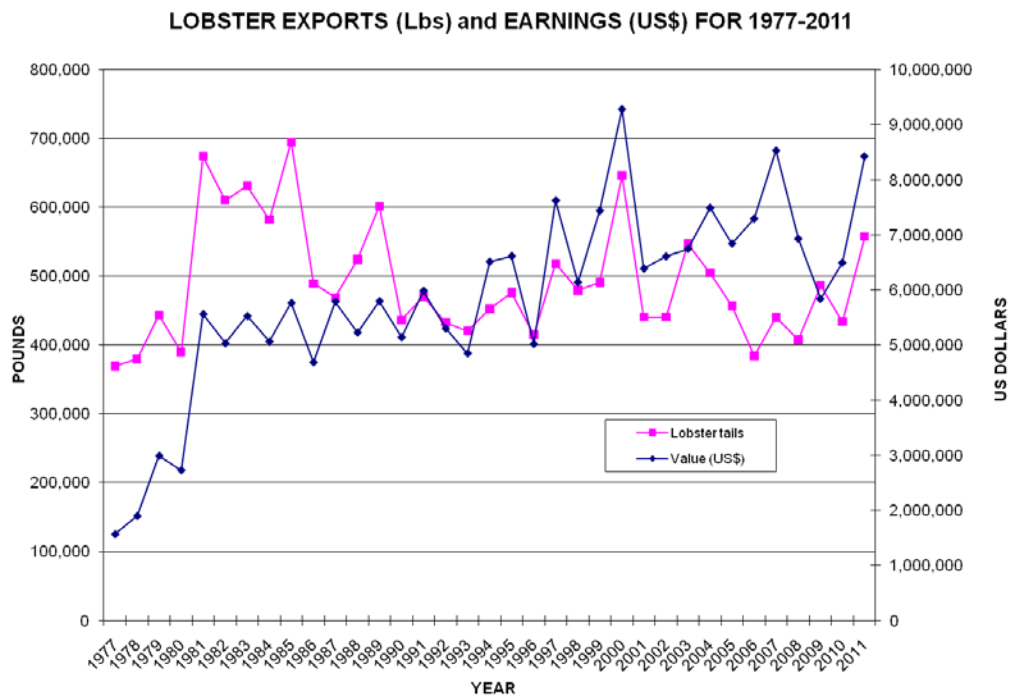
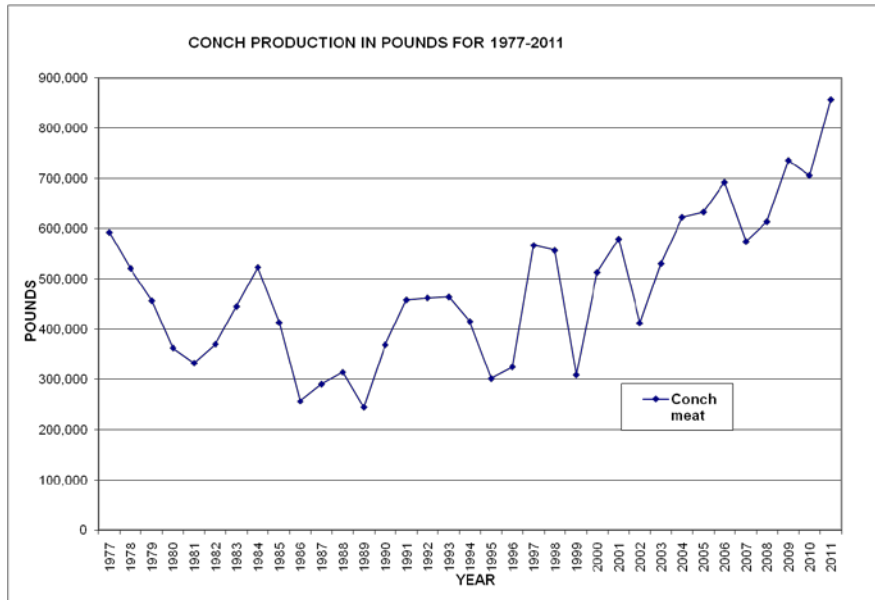


Figure 4. Lobster tails and export earnings during the period 1977 to 2011

## 2.2 Conch fishery

The Queen conch was the second most important fishery commodity. Conch meat landings increased by 21.3% from 705,775 lbs in 2010 to 856,425 lbs in 2011. Conch meat export volume increased by 9% from 726,050 lbs in 2010 to 791,350 lbs in 2011. Figure 5 shows annual conch production volume for the period 1977 to 2011. Conch meat export earnings increased by 2.44% from \$7.98 million in 2010 to

\$8.18 million in 2011 (see Figure 6). The increase in earnings is in response to increased sales and not necessarily to improved conch price in the US market.



*Figure 5. Conch production volume during the period 1996 to 2011*

The fact that conch production volume has shown a consistent increasing pattern since 1989 and with a major leap of more than 150,000 pounds in 2011 in correspondence to increasing fishing effort (a measurement used is the number of fishermen) levels indicates that this fishery continues to grow. In fact, conch production volume of 600,000 pounds of 1977, when fishing effort was much lower, was surpassed in 2004 and since then it is only in 2007 when the production volume fell slightly below that amount.

Continued application and persistent high fishing effort to this fishery however, is not recommended. Ways and means of curbing the current increasing trend in fishing effort need to be identified and applied as soon as possible to ensure the conservation and sustainability of the conch fishery.

Conch export earnings have also increased in parallel with the increasing production volume over time. This year's earnings are the highest ever recorded in the conch export history and is the second time only when this value is over \$8 million (2006 was the other year). The high export earnings is the result of high sales and is not associated to higher market prices. High fishing effort in the conch fishery is a major concern to the fisheries administration and efforts are being made to control it with the intention of reducing the number of fishermen that participate in this fishery.

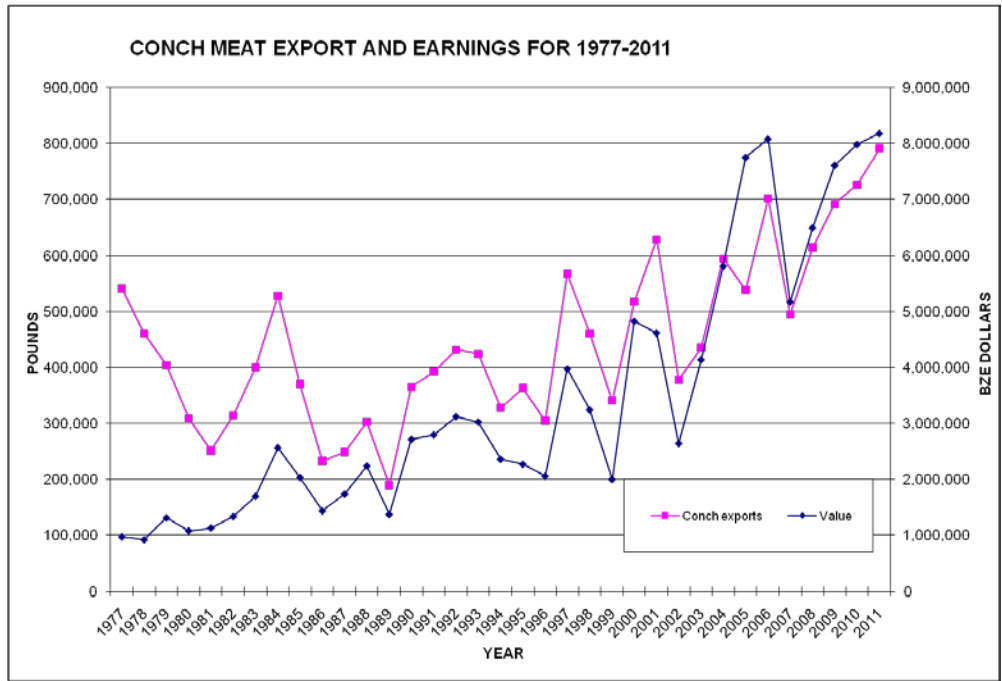


Figure 6. Conch meat export and export earnings from 1977 to 2011.

### 2.3 Finfish fishery

In 2011, finfish production volume (export only) once again increased significantly by 115% from 124,772 lbs in 2010 to 268,340 lbs and export earnings were estimated at \$805,020. It is noted however, that the aforementioned finfish production volume is for export only.

In addition to the exports, finfish landings for local consumption at the municipal markets in Corozal, Dangriga, Punta Gorda and Belize City were estimated at 335,400 lbs in 2011 and generated an estimated income of \$1,341,600. Fish fillet production volume increased by 50% from 11,393 lbs in 2010 to 17,090 in 2012.

Some thirty (30) finfish species are harvested commercially in Belize. The main species harvested by production volume (with over 1500 lbs per month) include yellow tail snapper, jack, grunt, white grunt, dog snapper, mackerel, porgy, silk snapper, black snapper, pork fish, grouper, red grouper, mutton snapper and crevalle jack, by order of importance.

### 2.4 Shrimp fishery

No shrimp trawling was carried out in 2011 due to the passing of Statutory Instrument to ban all forms of trawling (including shrimp trawling) in Belize’s waters.

### 2.5 Sea cucumber fishery

In 2011, the sea cucumber fishery remained strong and viable. The two main species of commercial importance were still Donkey dung sea cucumbers (*Holothuria mexicana*) and Three-rowed sea cucumbers (*Isostichopus badionotus*). Some 50,000 pounds of dried and salted sea cucumber was exported to the US by four (4) authorized exporters.

## **2.6 Shark fishery**

The shark fishery continued as a small scale and artisanal fishery in 2011. Legislation was passed this year to protect the Nurse shark (*Ginglymostoma cirratum*) due to its increasing importance in the tourism sector. Shark and Ray Alley located on the barrier reef between San Pedro and Caye Caulker is an excellent example of the importance of this shark species to tourism. Another shark species that was protected in the same legislation is the Hammerhead shark (*Sphyrna mokarran*). The most common shark species landed in 2011 included (a) Blacktip shark (*Carcharhinus limbatus*) (b) Bonnethead shark (*Sphyrna tiburo*) and (c) Bull shark (*Carcharhinus leucas*).

## **3. Statistics and sampling**

Catch per Unit Effort (CPUE) data for lobster and conch was collected from the two main fishermen cooperatives based in Belize City. The CPUE data sets have been compiled for the last five years and are being analyzed. The results will be analyzed by the end of July 2012.

Fishery dependent lobster catch data was also collected this year in Fishing Zone 5 (most important fishing area) by personnel of the Capture Fisheries Unit. The staff of the marine reserves which should have collected catch data in other fishing zones was not done as expected. This issue has been addressed with the relevant personnel, and data collection is expected to resume at the opening of the lobster fishery in mid-June 2012. Lobster catch data was also collected on a weekly basis at landing sites (fishermen cooperatives). All shipments of conch meat were inspected to ensure compliance with Belize's fisheries regulations before a CITES export permit is issued by the Fisheries Department.

Finfish production data was also collected on a monthly basis from fish markets in the principal coastal fishing communities including Corozal Town, Belize City, Dangriga Town and Punta Gorda Town. The monthly data sets collected in these communities include catches by species, catches, area fished, gear used and days spent fishing.

## **4. National Fisheries Policies and Management Objectives**

The national fisheries policy and management objectives remain practically unchanged for 2011 except for the recent approval (June 2011) by the Government of Belize for the development and implementation of a Managed Access / Catch Shares program that will be first introduced in the Glovers Reef and Port Honduras Marine Reserves.

It is remarkably heartening to notice that fishermen generally appreciate and accept the concept and implementation of the Managed Access / Catch Shares Program in the Glovers Reef Marine Reserve and Port Honduras Marine Reserve in 2011. This program seeks to better manage fishing effort and the fishery resources in those two protected areas but the full benefits are yet to be seen when the program is rolled out nationally and fishermen or groups of fishermen are assigned fishing rights to certain fishing areas and quotas for the various fishery commodities.

The major fisheries policy objective seeks to maintain a sustainable yield of the fisheries resources while continuing to contribute to food production, foreign exchange earnings and to improved nutritional status in the longer term. Specifically, the fisheries policy will:

- Encourage and promote sustainable fish production systems in both sea areas and inland fisheries.
- Diversify production of the underutilized fish species in traditional waters so as to reduce pressure on high valued fish.

- Encourage deep-sea fishing to take advantage of the 12-mile zone.
- Increase value added activities in the production system, fish processing and prepared fish food.
- Improve management of the ecological systems and marine environment of fish habitats.
- Expand production of non-traditional fish species.
- Retain product quality and remain competitive in export markets.
- Improve the economic and social well being of fishers and their communities.

## **5. Research**

Fisheries research continues to be directed to the two main commercially important fishery resources: Spiny lobster (*Panulirus argus*) and Queen conch (*Strombus gigas*). A National Conch Survey is scheduled to be carried out during the period mid-August to 15 September 2012 and a Catch Quota for the 2012 fishing season will be determined. This survey will be carried out in compliance with the bi-annual conch stock assessment as agreed with the Convention for International Trade of Endangered Species of Flora and Fauna (CITES).

As was done in 2010, the 2012 national conch survey will be carried out using line transects along the entire length of the Belize Barrier Reef (World Heritage Site). Some of the sampling stations along the barrier reef where the underwater belt-transects will be carried out include open fishing areas and the marine reserves of Belize: Bacalar Chico Marine Reserve, Hol-Chan Marine Reserve, Caye Caulker Marine Reserve, South Water Caye Marine Reserve, Gladden Spit and Silk Cayes Marine Reserve, Sapodilla Cayes Marine Reserve, Glovers Reef Marine Reserve, Laughing Bird Caye National Park and other sites.

## **6. Legislation and Management Regulations**

The final draft of the Aquatic Resources Bill 2012 has been completed and is being revised by the Office of the Attorney General before being passed in the House of Representatives. The bill is very comprehensive and establishes the legal framework for fisheries management plans, fisheries research, international cooperation, conservation, marine reserves, licensing of fishers and boats and law enforcement functions of the Fisheries Department.

# NATIONAL REPORT OF DOMINICA

*Prepared by: Derrick Theophile  
Fisheries Liaison Officer – Data  
Fisheries Division*

## 1. About the Commonwealth of Dominica

The Commonwealth of Dominica, known to the world as the Nature Island of the Caribbean and the indigenous Kalinago as Wai'tu kubuli, is one of the small island nations of the Lesser Antilles within the Caribbean Archipelago. Some details about Dominica are presented below.

<b>Area</b>	750 km <sup>2</sup>
<b>Coastline</b>	148 km
<b>Maritime Claims</b>	
Contiguous Zone	24 nm (UNCLOS)
EEZ	200 nm (UNCLOS)
Territorial sea	12 nm (UNCLOS)
Shelf	900 km <sup>2</sup> (majority of shelf area is situated on east of island)
<b>Climate</b>	Tropical; moderated by Northeast trade winds; heavy rainfall. Average daytime temperatures range from 75 to 85 degrees Fahrenheit. There are two seasons, the dry season (January to April) and the rainy season (July to October).
<b>Terrain/Topography</b>	Rugged mountains of volcanic origin, covered with lush rainforests. Mountains extend deep into the sea (particularly on the west coast), hence there are steep drop-offs and very deep waters near shore. There are numerous rivers, streams and waterfalls. The island is 29 miles long and 16 miles wide.
<b>Natural resources</b>	Timber (forests), water, sand and stone.
<b>Environment</b>	Flash floods are a constant hazard (heavy rainfall). Rainforests cover more than 60% of the island.
<b>Population</b>	73,126 (July 2012 estimate)
<b>Language</b>	English is the official language. Creole (French Patois) is widely spoken.
<b>Government</b>	Full independence (1978) with republican status within the British Commonwealth. Now formally known as the Commonwealth of Dominica.
<b>International disputes</b>	None

## 2. Description of the Fishery and Fleet

The local fisheries industry is comprised of about 800 fisher folk (both men and women; there may be many more persons operating who are undocumented or unregistered) operating from fishing communities around the island, fishing from small open vessels, typically in an artisanal fashion. There are about 32 landing sites scattered along the coastline, the majority of which are on the west coast or Caribbean Sea side. The East Coast is far more difficult to operate from due to the harsh Atlantic Ocean, however, a few sheltered bays (both natural and man-made) allow for fishing communities to exist and even thrive, as in the case of Saint Sauveur and Marigot.

A typical fisher folk can be described as an un-married 40 to 50-something year old male with a primary school education. Fisher folk may be fishers, boat owners, fish vendors, gear or boat builders, outboard engine mechanics or any combination of these roles. This report focuses primarily on the activities of the fishers and the boat owners.

Fisheries here is multi-species focussed. Fishers may have a particular fish they target, but often times plan to catch more than one type of fish on any particular fishing trip. The gear used allows for catching multiple types of fish, except for specific situations.

## 2.1 Characteristics of the Fishing Boats

434 boats were reported during the 2011 Dominica Fisheries Industry Census. Keel-type boats were by far the most common, making up about half of the boats found in the industry. It should be noted the number of keel boats have dropped from 66% in 2008 to 52% in 2011. FRP (fibre-reinforced plastic) or pirogue boats have been gaining significance in the local fleet for several years now. Only 50 FRP vessels were reported in 2008. That number has more than doubled in 2011.

**Table 1: Boats by type and number. 2011 Fisheries Industry Census.**

Type	2008		2011	
	Count	Percent	Count	Percent
Canoe	95	21.4%	91	21.0%
Keel	292	65.8%	224	51.6%
FRP	50	11.3%	119	27.4%
Other	7	1.5%	0	0.0%
<b>Grand Total</b>	<b>444</b>	<b>100.0%</b>	<b>434</b>	<b>100.0%</b>

All fishing boats in Dominica operate for a few hours a day (day-trips). Fishers usually leave shore in the morning and return between midday and sunset. Fishing trips tend to be about 6 to 8 hours from time of departure to return. Canoe trips tend to be shorter in most cases as they operate closer to shore. The time of departure varies by coast (east or west) and fishing community, based on the type of fish targeted or social customs. Time of return depends primarily on the amount of fish caught and the usual time of vending at the various communities. Boats tend to operate for 3 to 4 days a week, making fishing largely a part-time activity.

**Table 2: This table shows the characteristics of the types of fishing boats found locally.**

	Canoe	Keel	FRP / Pirogue
<b>Length range</b>	Typically under 20 ft in length. Usually 10 to 20 ft in length	Usually 15-25 ft in length	Usually 20-25 ft in length
<b>Construction / Description</b>	Made of dug-out gommier trunk	Wooden planked open vessel on a skeleton frame with a keel	Fully fibre glassed open vessel
<b>Propulsion methods</b>	Mostly un-powered. Oars are used for propulsion. In cases where outboard engines are used, they are	Powered by outboard engines (mainly 30-85 HP). Some boats carry two outboards. Oars are carried	Powered by outboard engines (mainly 30-85 HP). Some boats carry two outboards. Oars are carried



	15 HP or smaller	as a backup in some cases	as a backup in some cases. Some of the larger FRP vessels can carry dual 150 HP four stroke outboards
<b>Gear used</b>	Mainly uses net-type gear such as beach seines. Fish pots are also used	Hook and line gear is most popular, although the boats are known to carry fish pots as well	Hook and line, fish pots and even nets can be used off these boats. However, hook and line gear is most popular, especially when used for handling operations around FADs
<b>Species fished</b>	Small coastal pelagic such as ballyhoo, jacks and sardines. Reef fish such as parrot fish, groupers and snappers	Migratory pelagics such as tunas, dolphin fish, marlin, flying fish and wahoo among others. Reef species include snappers and groupers	Migratory pelagics such as tunas, dolphin fish, marlin, flying fish and wahoo among others. Reef species include snappers and groupers
<b>Fishing distance</b>	Canoes usually operate within one mile from shore	Can travel to over 20 miles off-shore, but usually operate within 10 miles	Can travel to over 20 miles off-shore, but usually operates within 10 miles

## 2.2 Fishing Gear

Fishing gear used locally comes in the form of hook and line types, net types and fish pot/trap types. Of these, almost 70% of all gear used is the hook and line variety. Pots make up about 20% of all gear and nets only make up 9% of all gear.

### 2.2.1 Hook and Line Gear

Although hook and line type gear can be and is modified to target demersals, over 66% of this type of gear is used for hand lining or trolling for pelagics. About 60% of the local fishers utilize hook and line type gear as part of their operations.

The trolling fishing method was utilized the most in recent years, but with the increasing popularity of FADs, fishers have reverted to hand lining near and around FADs for catching large migratory pelagics. This has saved considerably on fuel costs; where in the past fishers would troll over many more miles of water before coming upon a catch, they could now almost guarantee a catch off of the FAD. Fish typically caught from off-shore trips are dolphin fish, yellow fin tuna and blue marlin.

Other line type gear used locally include surface, vertical and bottom long lines. These, however are not the typical long line operations found in more developed countries with large scale fisheries operations, but an artisanal scale operation, consisting of a specially made gear that can be set or set adrift or simply held by the fisher off the side of the boat. This gear is fitted with multiple hooks. Some of these long lines can be used to target reef species such as snappers. Though they are used all over, line type gear is most popular in the South Western communities.

### 2.2.2 Net Gear

According to the 2011 FIC results, there are about 617 net-type gears utilized locally, the most common of which is the flying fish net followed by the gill net, cast net and dip net. These nets are used to

surround schooling fish and can be either pulled back into the boat or unto the shore after the fish is trapped. Species normally caught with these gears include small pelagics such as flying fish, ballyhoo, mackerels, jacks and small tuna. Nets tend to have a mesh size of 1.5 inches, as per the national fishery regulations. Nets are most common on the east of the island.

### 2.2.3 Fish Pots

This type of gear is a box-shaped structure constructed with wire mesh on a wooden frame. Fish pots can be set on the sea floor for days at a time. An entrance allows fish to enter but not escape the trap. Box (rectangular-shaped) and Z-type pots are the most popular found locally. A wide variety of fish can be caught using trap type gear, from demersals, such as snappers and groupers to lobsters and eels.

On average, fish pots soak for about 6 days at which point they are hauled (usually by hand) and the fish is removed. The pot is sometimes reset or brought to shore.

Pots also use a mesh size of 1.5 inches, conforming to the local regulations. Fish pots are most common in the communities of the North West.

## **2.3 Fish Aggregating Devices (FADs)**

FADs are structures set in the open sea for gathering fish. They are very popular here, being utilized by almost half of the fishing population at least once per week. FAD fishing is least common in the communities of the south and most popular in the east.

Traditionally, fishers have been responsible for building and setting their own FADs, as their own personal fishing gear and property within the waters of Dominica. However, the Fisheries Division is partnering with the National Association of Fisherfolk Cooperatives (NAFCOOP) to manage the use of FADs locally. Under this arrangement, NAFCOOP will be the sole body responsible for setting and maintaining FADs in Dominica and no individual fisher can claim to be the owner of any FAD in Dominican waters.

The most common problem encountered with FAD use is local piracy, where one fisher fishes off of the FAD of another fisher without his consent. The second most common issue is the presence of foreign (French) fishing vessels fishing off of local FADs.

## **2.4 Species Targeted**

Off-shore pelagics are most commonly targeted, followed by coastal or small pelagics and then lastly demersals. Following the 2011 FIC, however, it was observed that one in two fishers said that they targeted snappers. A similar number said they target dolphin fish and also tuna. One in three target blue marlin and one in five mentioned jacks as the target fish.

The most popular species are:

- Off-shore pelagics
  - Dolphin fish (*Coryphaena hippurus*)
  - Yellowfin tuna (*Thunnus albacares*)
  - Flying fish (*Exocoetidae*)
  - Blue marlin (*Makaira nigricans*)
  - Skipjack tuna (*Katsuwonus pelamis*)
  - Wahoo (*Acanthocybium solandri*)

- Coastal pelagics
  - Ballyhoo (*Hemiramphus brasiliensis*)
  - Jacks (*Carangidae*)
  - Mackerels (*Scombridae*)
- Demersals / reef
  - Queen Snapper (*Etelis oculatus*)
  - Red snapper (*Lutjanus campechanus*)
  - Groupers (*Epinephelus, Mycteroperca*)
  - Ocean Triggerfish (*Canthidermis sufflamen*)
  - Queen Triggerfish (*Balistes vetula*)

### Fish Prices

Fish price varies around the island by community and species of fish. Small fish such as ballyhoo can sell for as low as one dollar a pound, while lobster can go for fifteen dollars a pound locally. Small coastal pelagics tend to stay below six dollars, while large pelagics range from five dollars for marlin to nine dollars for dolphin fish. Demersals can hover at this same range but are often times pricier, sometimes going for more than ten dollars a pound. Flying fish tends to go for three to five dollars a pound.

## **3. National Fisheries Management: Policy, Legislation and Regulations**

### **3.1 Policy and Management**

The national policy for fisheries continues to be promoting sustainable fisheries for all Dominican fishers. The mission statement of the Fisheries Division is:

*To optimize the contribution of the fisheries sub-sector to the Dominican economy through its sustainable management and development by creating an enabling environment for sustained employment, enhanced food and nutrition security, reduction of poverty and for enhancing the contribution of fisheries to the economic diversification of food production in Dominica.*

**Table 3: Overview of the fisheries managed (Fisheries Management Plan)**

<b>Fishery Managed</b>	<b>Fishing Methods</b>	<b>Area Fished</b>	<b>Resource Status</b>
Shallow shelf reef fisheries	Fish traps, set nets, spear guns	Coastal coral reefs and insular shelf area	Most shallow reef fish resources are considered to be fully or exploited
Coastal pelagic fisheries	Hand lines, floating gillnets, cast nets, troll lines	Near /coastal areas	Unknown.
Deep slope fisheries	Fish traps, hand lines, vertical long lines	Deep sloping edges of the insular shelf, offshore banks	Although unknown some areas yield landings that suggest a potential for increased fishing
Large (offshore) pelagic fisheries	Troll lines, Long lines (vertical and mid-water)	Oceanic EEZ	Although ICCAT and others suggest caution recent yields from FAD fishing suggest a potential for increase

Recently, the Fisheries Division, under the African Caribbean Pacific (ACP) Fish II program, held consultations at major communities around the island (Roseau, Portsmouth and Marigot) on much needed

reform to the current policies governing the local fisheries. The aspirations of the stakeholders were documented as well as the challenges that impede the development of the industry. This European Union project aims to strengthen fisheries management in ACP countries.

### **3.2 Legislation and Regulations**

The Fisheries Act No. 11 of 1987 and the Territorial Sea and Contiguous Zone, Exclusive Economic and Fishery Zone Act No. 26 of 1981 provides the Fisheries Division of the Government of the Commonwealth of Dominica with the legal authority to manage the affairs of the marine capture fisheries and aquaculture in Dominica. This legal authority also extends to coordinating the discharge of national obligations to legally binding international fisheries agreements and instruments such as the UN Convention of the Law of the Sea (Part V), Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) and the International Commission on the Conservation of Atlantic Tuna (ICCAT).

There are specific regulations pertaining to:

- Designated berthing areas (landing sites) for fishing vessels
- Establishment and management of the Soufriere/Scott's Head Marine Reserve
- Registration of fishers and fishing vessels (including vessel registration markings and fisher registration cards)
- Conservation measures for sea turtles, conch and lobsters
- Gear mesh sizes (fish pots and nets)
- Safety-at-sea
- Erection and use of FADs for fishing
- Territorial Sea, Contiguous Zone and Exclusive Economic Zones

As the Fisheries Regulations are not yet gazetted and thus unenforceable, the Fisheries Division has encouraged and educated fishers on the best practices for ensuring the sustainability of the fisheries sector and promoted voluntary self-regulation and policing. The Fisheries Rules (1939) still apply legally until the new regulations have been promulgated but as a matter of policy the draft Regulations (2010) have been adopted.

Jurisdiction is also an issue, especially concerning sea turtles, which while at sea are covered by Fisheries Regulations, but while on the shore, are covered by Forestry and Wildlife Regulations.

Concerning flying fish, there are no specific management policies. However, there are regulations governing mesh sized for nets used for harvesting at juvenile stage (0.75 inch mesh) and at adult stage (1.5 inch mesh).

### **3.3 NAFCOOP**

The National Association of Fisherfolk Cooperatives (NAFCOOP) is the umbrella organization for fishing co-operatives in Dominica. It has ten co-operative affiliates with a combined total membership of about 400 persons. NAFCOOP is governed by a committee made up of nine board members, persons belonging to the various affiliate co-operatives. Activities include:

- Advocacy for fisher folk, representing the interests of fishers across the island
- Operating a fuel station for fishers at the Roseau Fisheries Complex
- Management of FADs within the waters of Dominica
- Participating in the Diamondback Squid research program

NAFCOOP is a key player in the management of the local fisheries industry, taking on key projects such as research to fisheries policy formulation.

## **4. Research**

### **4.1 Diamondback Squid**

Currently, the Fisheries Division is conducting exploratory research into Diamondback Squid (*Thysanoteuthis rhombus*) fishing in the waters off the West Coast. A new gear, the squid jig, is used to fish at about 500 meters depth for the squid. Diamondback squid is a high value product. A recipe book (with tasting sessions) and brochure were prepared to help generate public interest and promote development of the fishery. Fishing trips are done by the Fisheries Division in conjunction with interested fishers. This is a JICA supported project.

### **4.2 Queen Snapper Fishery Assessment**

This is a special research initiative conducted by Japan Cooperation Overseas Volunteer, Mr. Tetsuya Miyahara. The research involves collecting data from fishing trips of one fisher in the community of Fond Cole. The trip details are recorded, including gear and method utilized. Fish length is recorded as well as gonad details (weight and maturity).

### **4.3 Ghost Fishing**

This is another JICA project. The Ghost Fishing Research Program started in 2007 with the deployment of 10 fish pots into the waters off the west coast of the island. Two staff members have monitored the capture and kill rate along with the life span of these traps since then. Some promising results were obtained that could help promote more sustainable trap fishing practices.

A regional program on the use of biodegradable materials in fish pots was conducted, training fisheries officials from around the region last year.

### **4.4 Improved Fish Catch and Effort System**

Under the Moored Fish Aggregating Devices in the Lesser Antilles (MAGDELESA) project, the Fisheries Division intends to carry out a pilot project to test proposals for improving the current fish catch and effort data collection system. This project includes the development of a revised data collection form, improved collection methodology and data collection at new sites. Data collectors will also be equipped to capture some biological information on blackfin tuna (*Thunnus atlanticus*).

### **4.5 FADs**

There are a number of projects ongoing concerning FADs. These are:

- The JICA Master Plan Project: this looked at developing policy for the improved management of FADs and also capacity building for fisher folk and co-operatives for managing FADs.
- University of Florida FAD Project: this is primarily focused on data collection activities surrounding the use of FADs in the local industry. Data is collected at a few sites, looking at how FADs are used and managed by fisher folk.
- University of Texas A&M FAD Study: This project involves the tracking of fishing activity and effort through the use of GPS technology as well as FAD location and fishing effort around FADs.

- **MAGDELESA / IFERMER Project:** This is a study to test new FAD technology, constructed with new materials. So far two FADs were deployed off the West Coast of Dominica. This is a two-year pilot project conducted in Martinique, Guadeloupe, Dominica, St. Kitts and Nevis, St. Vincent and the Grenadines and Haiti. Data will be collected to study the fishing activity and species caught off FADs.

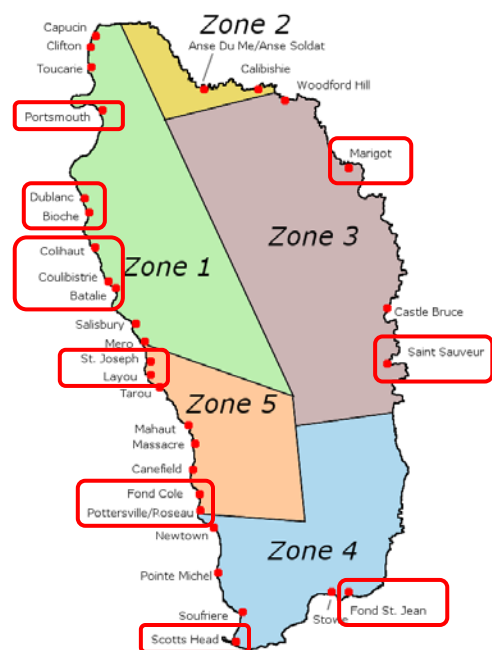
#### 4.6 Other Projects

- **FAO Disaster Risk Management:** This is a project about improved vertical long line fisheries for increasing catches and helping to promote national food security. Fishing equipment is already acquired and will soon be distributed to fishers. Data will be collected to study the usefulness of the improved gear technology.
- **Lion Fish:** This invasive alien species is now in Dominican waters. As a means of managing the impact of this new species, the Fisheries Division in collaboration with the dive operators and fishers keep a database on sightings and capture of the fish. A recipe book may be produced soon in an effort to encourage the capture and consumption of the fish.
- **Fisheries Industry Census (FIC) 2011:** As a follow-up to the 2008 FIC, a second census was held in 2011. A report of the results is nearing completion and will afterward be printed for distribution.

The survey involved interviewing over 800 persons who operate in the industry. Target groups were fishers (current and retired), fish vendors, boat owners, gear and boat builders/repairers and equipment suppliers. The survey was run during the latter half of 2011. This project was funded by the Japan International Cooperation Agency (JICA). A critical baseline dataset giving an overview of the current state of the fishing industry was obtained.

### 5. Fisheries Statistics and Sampling Programs

#### 5.1 Fish Catch and Effort



**Figure 1- Map of Dominica, divided by Fisheries Liaison Officer (FLO) Zones, showing landing sites, with data collection**

There is only one regular sampling program, this is the fish catch and effort sampling program. Data is collected at 13 landing sites around the island by 9 data collectors (part-time employees attached to the Fisheries Division). Random sampling is performed at all sites except for Marigot (after the completion of the new fisheries facility in 2004) which captures all data for all boats landed. Generally, more than 50% of the day’s catch is sampled randomly by the data collector. Collection is done for at least 4 days weekly.

A data book is issued to data collectors monthly for the purpose of collecting the data. Datasets of interest are: date of catch, landing site name, number of boats sampled and total of boats fished at that date, boat registration number or other identification (usually owner or captain name), name of species caught, weight of species caught, gear used, fishing location (name of location), time spent at sea and number of crew members.

Data collectors are supervised by Fisheries Officers on field

visits. However, there were incidences in reduced data quality over the year, resulting in replacement of the offending collector(s). The Fisheries Division endeavours to maintain and improve the quality of information collected by hosting data collectors meetings, bringing every collector to the main office to discuss matters pertaining to the job, including data collection issues and results of data analyses.

## **5.2 Registration of Fishers and Fishing Vessels**

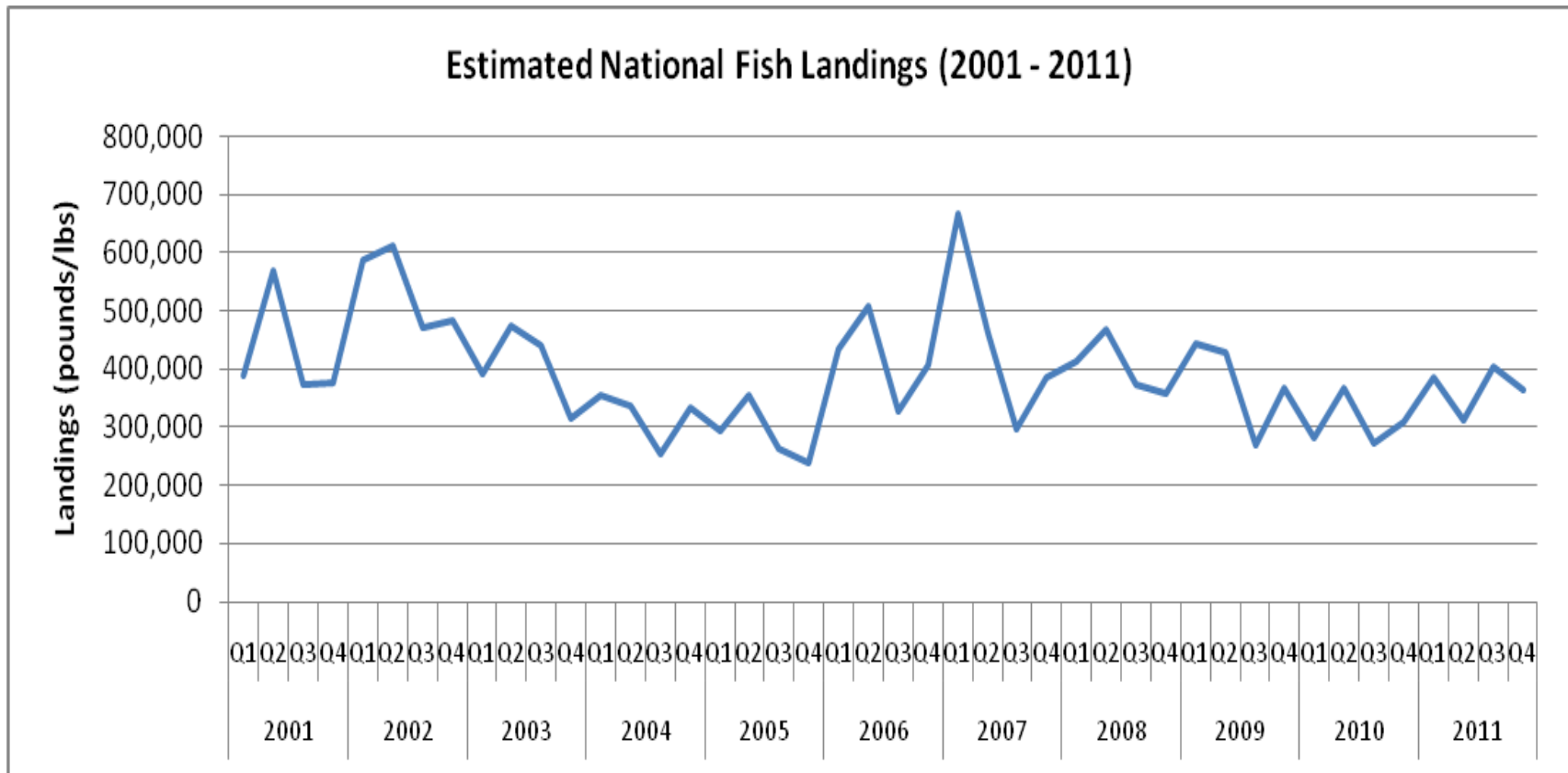
This program is simply a register of persons and vessels which operate within the industry. Registration is not yet mandatory in Dominica for a person to fish; however, the Fisheries Division has tied registration to benefits for fishers (such as duty free on fishery item imports, assistance for recovery after natural disasters). This encourages persons to get registered and make sure that their records are kept up to date.

## **5.3 Fisheries Industry Census**

The Fisheries Division has carried out two Fisheries Industry Censuses to date, one in 2008 and the second in 2011. These studies have helped fill knowledge gaps for the industry.

## **5.4 National Fish Production**

The chart below shows the national fish production trend for Dominica for the past ten years.



*Figure 2. National fish production trends for 10 years (2001 - 2011)*



**Table 4- Estimated Fish Landings (2001 - 2011). Values in pounds (lbs).**

<b>Month</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
January	65,638	198,288	133,318	95,635	116,172	122,040	204,916	136,314	114,207	84,308	103,915
February	92,807	194,495	111,510	116,929	79,689	134,555	175,536	141,064	121,154	91,876	111,832
March	229,713	193,005	146,809	141,213	98,678	176,779	287,343	135,503	209,255	106,702	169,630
April	161,271	261,047	162,707	120,053	105,536	205,587	175,784	148,341	154,039	134,728	134,589
May	250,088	164,951	179,702	107,114	94,568	155,610	170,284	180,042	149,640	127,847	94,137
June	156,873	184,578	132,213	107,902	155,390	147,375	116,930	138,178	123,245	105,501	82,865
July	132,488	145,695	162,460	75,919	109,047	110,204	92,168	136,463	77,771	97,195	115,483
August	134,789	167,805	144,505	102,601	64,438	135,697	86,599	125,001	90,365	92,115	164,547
September	106,465	156,993	133,289	76,334	90,177	81,028	117,640	111,372	101,104	83,154	124,475
October	116,416	195,864	131,447	71,267	86,022	117,894	112,377	114,830	108,801	110,841	141,136
November	103,020	168,893	78,885	146,147	78,776	121,702	124,264	118,129	165,523	99,285	126,602
December	156,037	118,108	105,551	116,928	74,878	168,079	148,105	124,105	93,540	99,289	96,464
<b>Grand Total (lbs)</b>	<b>1,705,605</b>	<b>2,149,722</b>	<b>1,622,395</b>	<b>1,278,042</b>	<b>1,153,372</b>	<b>1,676,549</b>	<b>1,811,946</b>	<b>1,609,343</b>	<b>1,508,643</b>	<b>1,232,842</b>	<b>1,465,676</b>

The chart below shows the sampled landings of flying fish over the last five years.

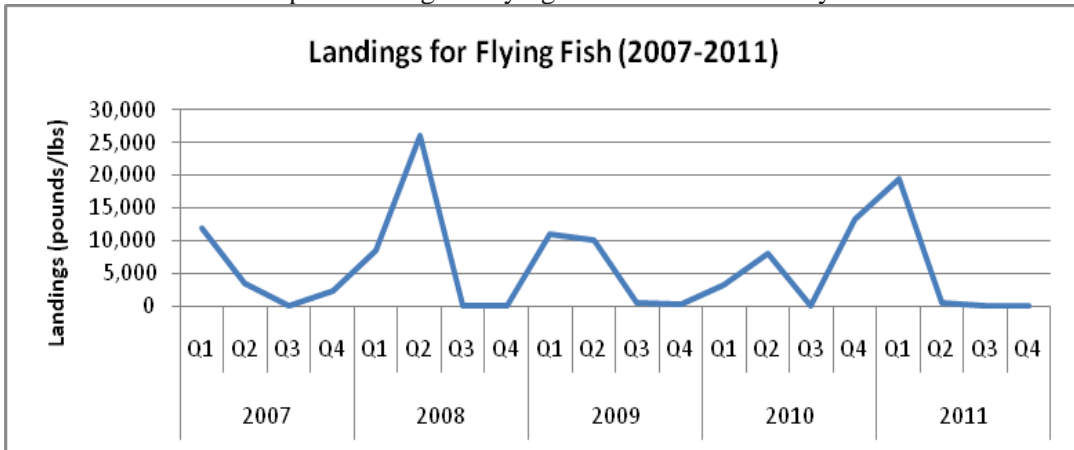


Figure 3: Landings of flyingfish (2007-2011)

Table 5- Landings for flying fish (sampled data). Values in pounds (lbs.).

Years	Q1	Q2	Q3	Q4
2007	11,867	3,400	80	2,346
2008	8,575	26,053	35	130
2009	10,998	10,089	562	324
2010	3,183	8,128		13,267
2011	19,482	622	26	120
<b>Grand Total (lbs)</b>	<b>54,105</b>	<b>48,292</b>	<b>703</b>	<b>16,187</b>

# NATIONAL REPORT OF GUYANA

## **1. General Outline of Fishery and Fleet Description**

### Industrial

- (i) Penaeid (prawns) Trawl Fishery
- (ii) Sea Bob Fishery

### Semi-Industrial

- (i) Red Snapper Fishery
  - (a) Hook and Line
  - (b) Traps

### Inshore Artisanal

- (i) Chinese Seine Fishery
- (ii) Cadell Line Fishery
- (iii) Gillnet Fishery
  - (a) Gillnet polyethylene, outboard engine
  - (b) Gillnet polyethylene, inboard engine
  - (c) Gillnet nylon, outboard engine
  - (d) Circle seine (modified gillnet nylon, outboard engine)
  - (e) Tangle seine (modified gillnet nylon, outboard engine)
- (iv) Pin Seine Fishery

### Inland Fishery

- (i) Subsistence Fishery
- (ii) Ornamental Fishery

### Aquaculture

- (i) Freshwater Culture
- (ii) Brackish Water Culture

## **2. Characteristics of the Offshore Fishing Fleet of Guyana**

The Offshore Industrial fishery consists of one hundred and twenty five (125) trawlers, eight (8) large fish / shrimp processing plants and numerous wharves and dry docking facilities. Thirty-one (31) trawlers are licensed to catch penaeid shrimp while ninety-four (94) are licensed to catch seabob. Ice and freezing facilities servicing this fishery are owned and operated by participants within and outside the fishery sub-sector.

Thirty-one (31) trawlers are exploiting mainly penaeid shrimp (*P. brasiliensis*, *P. notialis*, *P. schmitti*, and *P. subtilis*) with finfish and small amounts of squid (*Loligo spp.*) and lobster (*Panulirus spp.*) as by-catch. Ninety-four (94) mainly exploit seabob (*Xiphopenaeus kroyeri*) and various fin-fish species (*Macrodon ancylodon*, *Micropogonias furnieri*, *Nebris microps*, *Arius spp.*, *Cynoscion spp.*), with small quantities of penaeid shrimp as by-catch. The Turtle Excluder Devices (TED's) are mandatory for the entire shrimp trawl fleet. One company is using BRD on the trawl nets.

The Semi industrial fishery consists of agreements for Venezuelan vessels to operate in Guyana's waters, by Guyanese companies renting these vessels. There are forty-three (43) local vessels licensed to operate traps.

### 3. Characteristics of the Artisanal Fishing Fleet of Guyana

No. of Vessels		Method of Propulsion	Length of Vessels (m/ft)	Gear Type	Trip length	Catch Composition	Crew Size	Preservation method	Principal Fishing Area
Frame Survey	2011 Vessel Count Exercise								
558	64	Inboard diesel Lister, Perkins 210 hp	12-15/40-50	Gillnet polyethylene (inboard)	12-18 days	Grey snapper, sea-trout, gillbacker, tarpon, spanish- mackerel, croaker, snook, shark spp.	4-6	Ice	Area between 10 and 20 fathoms.
	296	Outboard engine 48 hp	8-11/35	Gillnet polyethylene (cabin- cruiser)	6-12 days	Grey snapper, sea trout, pagee, tarpon, croaker, gillbacker, spanish mackerel.	4-6	Ice	Area between 10 and 20 fathoms
	448	Outboard engine 25 hp	30m	Gillnet nylon	1-2 day	Bangamary, sea-trout, butterfish.	4-6	Ice	Area between 10 and 15 fathoms
253	307	Sail, outboard engine 6 - 9 hp	6.40-12.19 m (21-40ft.)	Chinese seine	6 - 12h	Whitebelly, seabob, immature fish, bangamary, butterfly, catfish	2-4	Fresh	Estuaries, river mouths and banks on the coast.
79	87	Outboard engine 6 - 9 hp	6 - 9/15 -30	Cadell	12h	Catfishes, sharks spp.	2-4	Fresh	Areas between 5 and 10 fathoms.
46	26	Sail, outboard engine	6 - 9/15 -30	Pin Seine	12h	Mullet, snook, queriman, catfish, croaker, bangamary.	2	Fresh	Intertidal zones

#### **4. Statistics, Research and Resource Assessment**

- The Government of Guyana received technical assistance for a pilot project under the CRFM / JICA Master Plan Study during 2010-2011. Under the pilot project consultants reviewed and refined the Fisheries Statistical System. Suggestions were made on the number of gear types to be sampled per month in the various regions. Additionally the CRFM / JICA project assisted Guyana in its aquaculture program and staff was exposed to technical training provided by CRFM.
- Guyana participated in CRFM / Kingdom of Spain Survey to Determine Poverty Levels in Fishing Communities.
- The Department of Fisheries conducted an artisanal frame survey in 2011 and the results reflected an increase in the number of working vessels.

#### **5. Policy and Legislation**

The Ministry of Agriculture / Fisheries Department had consultations with stakeholders to discuss the Common Fisheries Policy. With the assistance of FAO, Guyana will be updating its Inland Fishery Policy. It is also scheduled to update the marine regulations and the creation of regulations for Aquaculture. Guyana is also working with the Trawler Association for the implementation of VMS and to discuss the Marine Stewardship Council Certification for the seabob subsector.

The Fisheries Management Plan (FMP) is scheduled to be updated for the period 2012 - 2016, the previous FMP was for the period 2007 - 2011.

#### **6. Development Activities**

The Department and the Ministry is providing technical assistance to those involved in aquaculture. Those involved in medium to large scale operations have had access to loans from ADSU project to develop and expand their operations.

There are plans for examination of gear types and limits to phase out the use of certain gear types in the future. Government, through the Ministry of Health and Ministry of Public Works, is examining the port / artisanal facilities and infrastructure with the aim of upgrading and improving the standards and quality of seafood landed. Two industrial companies are EU certified.

#### **7. Fisheries Management and Conservation Activities**

When a stock assessment was done on *Xiphopenaeus kroyeri* (seabob) in 2007, CRFM suggested a reduction of trawl fleet size by fifty per cent (50%). However, the Department has negotiated with the Guyana Association of Trawlers Owners and Seafood Processors for the implementation of a twenty percent (20 %) reduction. The Department of Fisheries, Ministry of Health- Veterinary Public Health Unit and the Guyana Trawler Operators and Seafood Processors (GTOSP) meet regularly to discuss the IUU and MSC. There are a few measures in place for IUU since it is the requirement for the companies exporting to Europe. There is also an annual six weeks 'closed season' for trawling for seabob in place.

Guyana has Co-operating Party status with ICCAT and has been submitting reports annually. However it should be noted that the fishery is artisanal and does not harvest the major species on the ICCAT list, with the exception of Spanish mackerel, King mackerel and sharks which are landed dressed (no fins, heads, etc). Since sharks are landed dressed the Data Collectors are unable to identify the species being caught.

**Table1: Fisheries Sub-sector Production for the period 2011 - 2009**

	<b>Annual Production (mt)</b>		
	<b>2011</b>	<b>2010</b>	<b>2009</b>
Prawns (whole weight)	368	931	747
Prawns (tail weight)	231	582	466
Seabob industrial (whole weight)	19,433	19,679	13,609
Seabob artisanal (whole weight)	196	686	1,818
Whitebelly (whole weight)	830	526	1,329
Total Shrimp (whole weight)	20,827	21,781	17,503
Finfish (industrial)	1,890	1,314	1,336
Finfish (artisanal)	20,889	22,969	23,175
Red Snapper	758	1,037	789
Total Finfish	23,537	25,320	25,300
<b>Overall Production</b>	<b>44,364</b>	<b>47,101</b>	<b>42,803</b>

**Table 2: Total Seabob caught from 2007 to 2011**

<b>Year</b>	<b># of Trips per year</b>	<b>Total Seabob per year</b>
<b>2007</b>	188	4,607,654
<b>2008</b>	1,134	14,825,848
<b>2009</b>	1,044	19,558,033
<b>2010</b>	1,945	26,354,282
<b>2011</b>	2,014	38,719,238

# **NATIONAL REPORT OF JAMAICA**

*Prepared by: Fisheries Division,  
Ministry of Agriculture and Fisheries,  
P.O. Box 470 Marcus Garvey Drive, Kingston*

## **1. 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 (21,400 registered fishers as at September 2011); 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 (5,971 registered boats as at March 2012), 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 gear includes the gill nets, seine nets, hook-and-line, and spear guns. There is also some fishing by SCUBA, Hookah / compressor as well as free-lung method. Larger decked vessels target lobster and conch on the offshore banks (primarily Pedro and Morant Banks; also Formigas, Henry Holmes and Grappler Banks).

Prior to early 1980's much of the catch landed by Jamaican fishers were sold locally in relatively small quantities to middle persons, small retailers or householders. However after this period a few companies and investors began exploiting high-value species (conch and lobster) for export to markets in North America, the Caribbean and Europe.

### **Landing Sites**

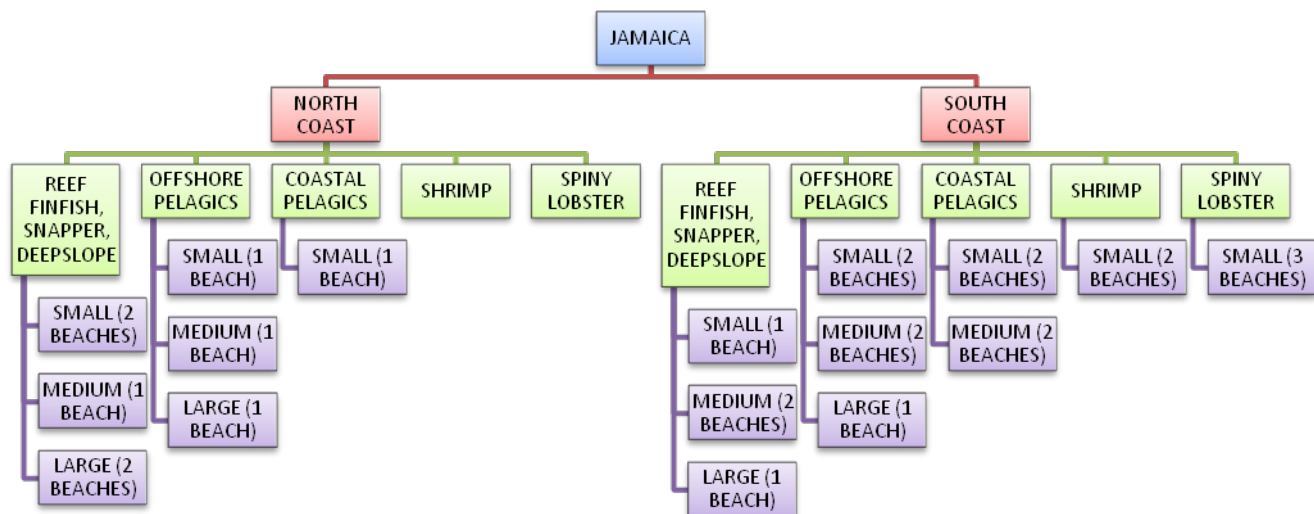
Landing sites in Jamaica range from small fishing beaches used by artisanal fishers (of which there are 187 distributed around the island) where catch is simply offloaded to buyers and small retailers waiting on the beach, to more developed landing areas with infrastructure able to accommodate the larger industrial vessels. Fishing beaches/landing sites are concentrated on the south coast which is nearer to the more important fishing grounds. Some of the more important landing sites include Old Harbour Bay, Port Royal, Rocky Point, Kingston, Black River and Whitehouse, Westmoreland.

## **2. Statistics and Sampling**

Jamaica is divided into two statistical areas, the north coast as area 1 and the south coast as area 2. During 1995, a survey was conducted in both areas at about 90% of the known landing sites to determine the number of vessels at each site and classify them by gear type, fishing ground and target fishery. As a result the beaches on the north coast were divided into six categories based on beach size (i.e. number of boats) and gear type while the south coast has three categories based on beach size. The categories are used as sampling strata and it is assumed that, within a stratum the gears, vessels and fishing grounds are homogeneous throughout the area. This means fishermen at all beaches within a category have access to fisheries of similar productivity. Once all the beaches were classified into strata, one or more beaches were selected to be sampled in each stratum (See figure 1).

Each sample beach is visited two days per month and the data collected from vessels landing that day. The data includes vessel identification, fishing effort (amount of gear, number of crew, hours fished), fishing ground, species landed by weight and price. Other data collected includes total number of vessels that went to sea that day, the number of fishing days for the month and descriptive comments on the weather and beach conditions.

Biological data such as weight, length, sex and maturity of select species are also collected monthly. These species include the Atlantic thread herring, Caribbean spiny lobster, shrimp, dolphinfish, skipjack tuna and conch. In conjunction with the catch and effort data, the biological data is used for stock assessment and for detecting trends etc., which are necessary for proper decision making.



*Figure 1: Overview of the sampling plan for the artisanal fishery of Jamaica*

## Landings Estimates

Annual catches for both marine and inland fisheries for the period 2001 to 2010 are shown in table 1 below. Import and export data are obtained from the Statistical Institute of Jamaica (SIOJ). However, current information was not available at the time of this report.

**Table 1. Jamaica fish production trend 2001 - 2010 (MT)**

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Artisanal (Finfish)</b>	4348.57	7,000.00	4594.92	8811.03	7158.39	12329.85	11,048.24	9475.01	12544.43	11,389.85
<b>Conch</b>	946	946.00	504.25	550.00	640	650	640	400	400	440
<b>Lobster (Industry)</b>	943.39	358.67	300.00	134.49	362.00	97.98	150	150	150	200
<b>Shrimp</b>	38.5	37.54	37.00	-	875.04	476.10	-	-	105	283.9
<b>Others</b>	51.38	144.00	456.00	-	-	-	-	-	5.6	
<b>Total Marine Fish Production</b>	6,327.84	8342.21	5436.17	9495.5	9035.43	13067.83	11,838.24	10,025.01	13,205.03	12,313.75
<b>Total Tilapia Production</b>	5,000.00	5995.44	2968.50	4200.00	4795	7,543.35	5,600	5,800	5,030	3,900
<b>TOTAL Fish Production MT</b>	<b>11,327.84</b>	<b>14,337.65</b>	<b>8,404.67</b>	<b>13,695.52</b>	<b>13,830.43</b>	<b>21,087.28</b>	<b>17,438.24</b>	<b>15,825.01</b>	<b>18,235.03</b>	<b>16,213.75</b>



### **3. National Fisheries Policy and Management Objectives**

The Draft National Fisheries Policy (2008) provides a framework for the formulation of management strategies designed to address the important issues, challenges and opportunities facing the industry including; globalization, trade expansion, economic efficiency, industry structure and governance, and food safety and quality. The main goals of the National Fisheries Policy are:

- (1) Improve contribution to economic growth and reduction of poverty
- (2) Improve contribution to sustainable livelihood of Jamaicans through employment in fisheries and responsible fisheries management
- (3) Improve fisheries contribution to National 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 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.

#### **(a) 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 the continued drive to establish functional Special Fisheries Conservation Areas (Fish Sanctuaries) will help to improve fish populations. Increased surveillance and enforcement of legislation is also needed to stop persons destroying the reef.

#### **(b) Deepslope Fishery**

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

The deepslope fishing areas 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.

**(c) Coastal Pelagics**

**Objectives:** 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 of any destructive practices in the zone.

**(d) Large Pelagics**

**Objectives:** 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 preferably on a regional basis, and a regional management plan developed.

**(e) Lobster**

**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 and juvenile (below 76mm carapace length) lobsters and to prohibit the landing of lobsters during the close season. There is need for greater gear restrictions, effort reduction and co-management arrangements.

**(f) Conch**

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

Jamaica has been recognised as a major conch producer regionally (Chakallal and Cochrane 1996) and continues to do so with exports averaging just under 500MT since 2005 (NEPA CITES export data, 2005 - 2010). The commercial fishery for queen conch is based on the Pedro Bank. The fishery is managed utilizing annual total allowable catch limits and individual non-transferable quota systems. Total Allowable Catches (TACs) are established based on scientific assessments of the status of the conch population on the Pedro Bank.

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.

**(g) Shrimp**

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

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

## **4. Research**

The Fisheries Division and its partners including private and public bodies both local and international conduct a number of research and development projects / programmes from time to time geared at addressing various industry-related issues. These studies are more often in line with the national policy director as previously outlined. Current research projects / programmes along with resources necessary for their completion are listed below.

### **4.1 Lobster Management Programme (LMP)**

The LMP seeks to use scientific research as a background for management and policy decisions in an effort to protect and sustainably manage the Caribbean Spiny Lobster, *Panulirus argus*, fishery in Jamaica. The LMP focuses on the three main lifecycle stages of the Caribbean Spiny Lobster, namely the adult stage, juvenile stage and the puerulus or post larval stage. The programme seeks to conduct research on these main lifecycle stages so as to be able to accurately determine a) seasonality of each stage; b) current stock size; c) carrying capacity of the fishery; d) policy measures required for the sustainability of the fishery and (e) the use of lobster juvenile condominiums as an enhancement tool. The type of data collected at this time is mainly fishery dependent catch and effort data on adults and fishery independent data on pueruli and juveniles. The LMP is split into three monitoring programmes as follows:

#### **(1) Pueruli Monitoring Programme**

The Programme was established to develop a seasonality forecast of the larval (pueruli) stage of the Spiny Lobster. This seasonality forecast would then be used to predict the number of Spiny Lobster recruits that would enter the existing population.

#### **(2) Lobster Biological Data Collection (OHB)**

This programme was established in 2010 and consists of measuring the adult stage of the Spiny Lobster that is caught by the local fishers located on the Old Harbour Bay fishing beach. The type of data collected include sex, carapace length, tail length, sample weight and where possible the type of fishing gear used, fishing ground and soak time is also recorded. This aspect of the program has been temporarily suspended in Old Harbour Bay since 2011.

#### **(3) Lobster Condominium Programme**

The programme was established to develop a seasonality forecast and stock assessment of the juvenile stage of the Spiny Lobster. This programme was expanded in 2010 to conduct research into the use of condominiums to help provide additional habitat for the enhancement of the juvenile stage of the lobster life cycle.

### **4.2 Artificial Habitat Enhancement**

This project, commencing March 2012, is aimed at firstly developing appropriate enhancement structures that can provide habitat or improve existing habitat for fish, lobster and other important marine species. Secondly, identify and prioritize areas for the deployment of enhancement units in a range of habitats including seagrass beds, pavement, sand, and near coral reefs. An additional aspect of the project is the establishment of a coral garden which will be used to transplant corals unto suitable reefs and artificial enhancement structures with an aim to improve their functionality.

This project is a follow-up to the previous Improving Jamaica's Agricultural Productivity Project (IJAPP) which sought to deploy Lobster Condominiums for the enhancement of juvenile lobster habitat and artificial reef structures (EcoReef) with emphasis on the enhancement of important fish species.

#### **4.3 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

#### **4.4 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. Enforcement activities are however limited due to budgetary constraints.

#### **4.5 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. A new legislation which prohibits persons from having lobsters during the Close Season took effect in 2009.

#### **4.6 Monitoring and Support to Fish Sanctuaries**

The Fisheries Division currently has 14 sites across the island declared as Special Fishery Conservation Areas (fish sanctuaries). These sites were selected based on the following criteria:

1. Ecological characteristics: presence of seagrass beds, a reef system, and/or shallow waters abutting mangrove stands
2. General agreement of the primary stakeholders: fishers, investors, hotel and tourism businesses
3. The presence of a management entity with which the Fisheries Division may form partnerships
4. The potential impacts that point-source pollutants may have on these sites

The management of these sanctuaries is a collaborative effort between government and local community organizations, particularly fisher organizations and non-governmental organizations (NGOs).

#### **4.7 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*.

### *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.

### *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:

- (1) Fishing beach infrastructure redevelopment for thirty (30) beaches.
- (2) Fisheries conservation and rehabilitation which seeks to improve capture fisheries by the rehabilitation of destroyed habitats.
- (3) Strengthening stakeholder capacity

## **5. 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<sup>2</sup>) 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 Fisheries, and the Aquaculture, Inland, Marine Products and By Products (inspection, licensing and export) Act 1999 administered by the Veterinary Division. As part of the modernization of the public sector the Fisheries Division is currently undergoing transformation into an executive agency. This will result in a semi-autonomous agency with greatly improved efficiency. As part of the modernization process a Chief Executive Officer (CEO) is in place to drive the transformation into an executive agency. The transformation is expected to be completed by 2012.

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. Table 2 below provides a summary of this and other important fisheries legislation.

**Table 2. Summary of important legislation governing Jamaican fisheries**

LEGISLATION	OBJECTIVE & SCOPE	LEGISLATION	OBJECTIVE & SCOPE
PRIMARY LEGISLATION		INTERNATIONAL CONVENTION & LAWS	
Fishing Industry Act, 1975 and Fishing Industry Regulation, 1976	licensing and fishing regulation with territorial and archipelagic seas.	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
OTHER FISHERIES-RELATED LEGISLATION		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
Morant and Pedro Cays Act, 1907	licensing of fishers based on offshore banks	Conservation and Management of Straddling Fish Stocks and highly Migratory Fish Stocks	- part of the implementation of the provisions of the UNCLOS
Wildlife Protection Act, 1945	prohibit deleterious fishing practises (eg. Dynamite); protection of manatees; turtles etc.	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
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, 1971 The 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		

## 6. References

Chakallal, B. and K.L. Cochrane. 1996. The queen conch fishery in the Caribbean – An approach to responsible management. Presented at International Meeting on Queen Fishery, Puerto Rico, 29 – 31 July 1996:18.

Draft National Fisheries Policy. 2008.

# **NATIONAL REPORT OF ST. LUCIA**

## **1. Introduction**

The Ministry of Agriculture, Lands, Forestry and Fisheries, through its Department of Fisheries, is responsible for the management and development of the fisheries sector. It works with a range of other government agencies and non-government organisations and institutions, including fisher cooperatives which are based in most fishing communities.

The Government of Saint Lucia is committed to the conservation and sustainable use of its fisheries resources for the long-term benefit of the people of Saint Lucia.

## **2. Fisheries Management Objectives**

- To contribute to the attainment of self-sufficiency and food security.
- To sustainably optimise the net incomes of the fishers and the communities involved in fisheries, and related economic activities.
- To sustainably optimise employment opportunities for those dependent on fisheries and aquaculture for their livelihoods.
- To maintain or restore populations of marine and freshwater species at levels that can produce optimum sustainable yields.
- To preserve rare or fragile ecosystems, as well as habitats and other ecologically sensitive areas, especially mangrove forests, sea grass beds, reefs and other spawning and nursery areas.
- To sustainably optimise the amount of fish protein available for domestic consumption.
- To improve on fisheries infrastructure and promote the use of appropriate fishing technologies with a view to sustainably optimise catch.

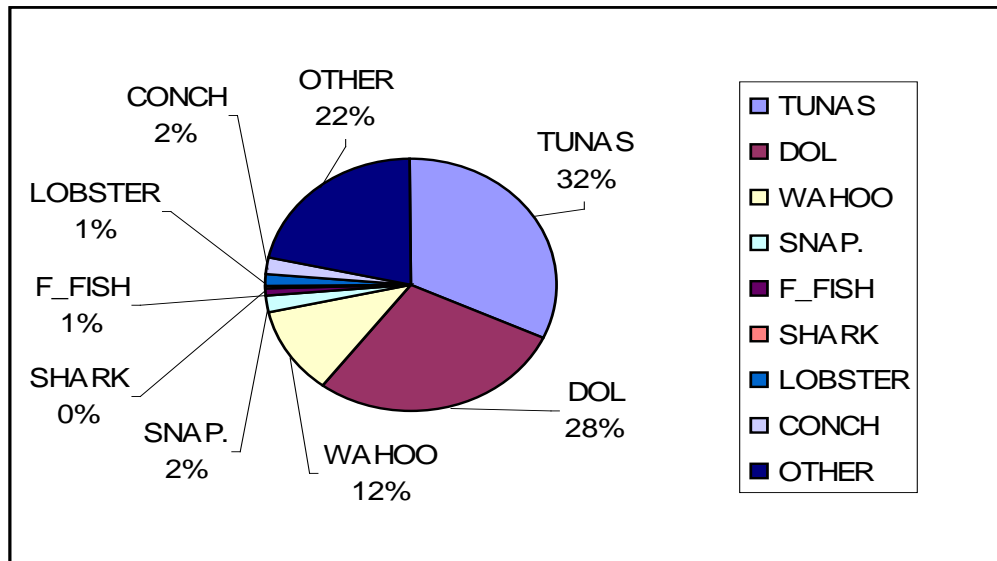
## **3. Fishery Description**

The Saint Lucia fishery comprises of demersal, coastal pelagic and offshore pelagic fisheries. There is some year-to-year variability among these resources in terms of fishing seasonings. The fishing year of Saint Lucia can be divided into two main seasons: a “high” season that extends from December to May when significant landings of offshore migratory pelagics occur and a “low” season that extends from June to November when relatively large quantities of demersal fishes are landed.

In 2011, the offshore pelagic fishery contributed 72% to the annual landings (Department of Fisheries, 2011) which is made up of a number of migratory species including dolphinfish (*Coryphaena hippurus*); Wahoo (*Acanthocybium solandri*); blackfin tuna (*Thunnus atlanticus*); yellowfin tuna (*Thunnus albacares*); Skipjack tuna (*Katsuwonus pelamis*); sharks (various families) and billfishes (Istiophoridae, Xiphiidae).

**Table 1: Total landings and percentages of landings for 2011**

Species	Tuna	Dol	Wahoo	Snap	FFish	Shark	Lobs	Conch	Other	Total
<b>Total Landing</b>	541	473	197	29	22	3	24	39	365	1693
<b>% Landing</b>	32	28	12	2	1	0	1	2	22	



**Figure 1: Percentage of landings for 2011**

The coastal pelagic fishery comprises of an array of species including: flying fish (*Hirundichthys affinis*); ballyhoo (Hemiramphidae spp.); barracudas (Sphyraenidae spp.); herrings (Clupeidae spp.); jacks (Carangidae spp.); and needlefishes (Belonidae spp.).

The demersal fishery lands the most highly priced and valuable species for the local and tourism sectors. These species includes: snappers (Lutjanidae spp.); groupers (Serranidae spp.); Caribbean spiny lobster (*Panulirus argus*); Caribbean queen conch (*Strombus gigas*) and other families of reef species classified in the annual landings as other. The contribution of this fishery to the total annual landings reflected 27%.

#### **4. Overview of the Fisheries Sector**

The Department of Fisheries' fishing fleet comprises of 643 registered commercial fishing vessels operated by 2502 registered fishers. (Department of Fisheries, 2011). The fleet consist of seven (7) vessel classes but is primarily dominated by open fibreglass pirogues (76%) and the traditional dig out canoes (12%). Table 2 illustrates the current vessel fleet categories and the vessel figures as of December 31, 2011.

The vessels in the fishing sector ranges from 3-25m and are powered mainly by engines ranging from 5 – 350 horsepower. On average, vessels engaged in the fishery are 7-8m long and are mainly propelled by 75 horse power outboard engines.



**Table 2: Fishing vessel fleet for the period ending 31 December 2010.**

<b>Vessel Category</b>	<b>Canoe</b>	<b>Pirogue</b>	<b>Transom</b>	<b>Shalooop</b>	<b>Whaler</b>	<b>Longliner</b>	<b>Other</b>	<b>Total</b>
Main Gear	Pots, Handlines	Trolling	Pots, Handlines	Pots, Handlines	Pots, Handlines	Trolling	N/A	
Total	80	486	40	19	6	9	3	643
%	12%	46%	6%	3%	1%	1%	0	

Due to the multi-species nature of the fishery, most vessels are generally equipped with multiple fishing gears which includes: trolling lines; flying fish nets; longlines (palangres); gillnets; handlines; and fishpots (traps). Fishing trips are usually one-day trips ranging from 3-8 hour durations.

## **5. Fisheries Statistics and Sampling Plan**

The catch and effort sampling plan is based on a stratified random sampling regime of three major strata: primary, secondary and tertiary landing sites. This classification is based on the number of vessels operating at the site, the fishery types and the volume of fish being landed.

The island's fishery operates out of 18 landing sites. However, catch and effort data is presently been collected from nine sampling sites (landing sites). These sampled sites include: Anse La Raye, Gros Islet, Castries, Soufriere, Choiseul, Vieux Fort, Micoud, Laborie and Dennery.

Data is collected from every other returning vessel for fifteen randomly selected days of each month. Information collected includes: area fished, species caught, gear used, hours fished, fuel consumed and total vessels out. Additionally, information is collected on area fished: the island's coastal waters are divided into two fishing zones for offshore pelagic and three fishing zones for nearshore and bank species. This data is then submitted monthly to the Department of Fisheries and entered into a database called the Trip Interview Programme (TIP).

### **5.1 Conch Fishery**

The Queen conch, *Strombus gigas* (Linnaeus, 1758) is one of the nearshore species of Saint Lucia. Presently, nearshore stocks have been over exploited, resulting in divers moving to deeper depths. Although this species is thought to be distributed around the island, only two significant populations have been identified, one to the north and the other to the south of the island (Nichols & Jennings-Clark, 1994). Information obtained from a survey of vessels targeting conch resources which was conducted in 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. The report also indicated that conch vessels target, on average, three areas on a rotational basis and were mainly landed at two landing sites: Gros Islet, located at the north of the island; and Laborie on the south west coast. Moreover, conch is more heavily targeted in the north of the island than the south (Joseph, 2003).

Conch is exploited commercially all year by over 40 fishers in depths ranging from 11 m to 43 m and fishers operate mainly out of fibreglass pirogues ranging in length from 7.02 m – 8.45 m which are powered by outboard engines of 115 – 250 hp. Joseph (2003) reported that whilst conch are 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 an average of five months. While most conch fishers undertake more than three dives a week and land an average of 300 conch per trip, the number of conch landed per trip is dependent on the number of divers and the number of dives undertaken during a trip, and can range from 100 - 500 conch (Joseph 2003). Joseph (2003) further indicates that two divers enter the water per trip and each diver undertakes between three to four dives (inclusive of decompression dive). However, subsistence exploitation occurs in shallower areas, but the extent is unknown.

The management objective for the fishery is to rebuild the conch stocks, especially nearshore and to ensure sustainable use of the resource.

### ***Fisheries legislation and regulations***

The Fisheries Regulations No. 9 of 1994 provides the mandate for the management of the conch fishery at the national level by prohibiting the harvesting of conch of less than 180 mm total shell length, less than 1 kg total weight and less than 280 g meat weight, not including digestive glands. In addition, these Regulations restrict harvesting of immature conch, defined as individuals without a flared lip. However due to financial and manpower limitations, enforcement focuses on only one of these Regulations - the harvesting of individuals with flared lips due to the ease of implementation in the field. The Fisheries Regulations also make provisions for a closed season but, to date, this management measure has not been implemented.

## **5.2 Large Pelagic Fishery**

This fishery, like the other fisheries in Saint Lucia, is primarily conducted from fibreglass open pirogue boats, using mainly trolling lines. The catch is highly seasonal, with the majority of activity and landings occurring between December to June, however peak landings occur between January to April each year. This fishery is active at all landings sites, but is more prominent at Dennery located on the east coast and Vieux Fort in the south of the island. The offshore pelagic fishery through the introduction of new fishing technologies such as the Fish Aggregating Device (FADs) and new fishing techniques such as longlining has contributed to increased landings.

The landings trends for large pelagics have remained progressive over the last few years. This increasing trend in pelagic landings may be contributed to the efforts undertaken by the Department of Fisheries to promote the fishery as an alternative to the near shore fishery and the increased use of Fish Aggregating Devices (FADs).

Unlike the nearshore fisheries, such as lobster and conch, which are regulated at the national level under the Fisheries Act and Regulation Cap 7.15, the pelagic fishery is currently not regulated.

The management objectives for this fishery, as outlined in the Fisheries Management Plan of 2006, include:

- The promotion of the sustainable development of the commercial and sport fisheries for large pelagic species;
- Cooperation with other Caribbean States to manage the large pelagic resources

## 6. Fisheries Policy and Regulations

The primary legislation governing management of the island's marine resources is the Fisheries Act and Regulation Cap 7.15. The Fisheries Regulations specify conservation measures such as gear restrictions, fishing method restrictions, closed seasons and creation of marine reserves.

The policy of the Government of Saint Lucia for the fishing sector focuses on development and management of the fishing industry through the promotion of sustainability of the sector through self-sufficiency by increased production from capture fisheries and the aquaculture sector (Department of Fisheries, 2006). Another major objective outlined within the fisheries policy is the social and economic advancement of fishers and their families. The Fisheries Management Plan, developed through a consultative process with resource users, guides the work program of the Department of Fisheries and outlines specific management plans for major fisheries of Saint Lucia (Department of Fisheries, 2006).

The Department of Fisheries is cognizant of the need to ensure that proper management regimes are in place to guide the management and development of the fisheries sector. In light of such, the Department of Fisheries with technical assistance from the Food and Agricultural Organisation, in 2001, reviewed the existing legislation with the aim of revising the legislation to encompass many of the new fisheries management paradigms. Many consultations and meetings were undertaken with stakeholders resulting in a proposed new Fisheries Act and Fisheries Regulations. At present the legislation is at the Attorney's General Office for review.

### 6.1 Other Fisheries-related Legislation:

- *Forest, Soil and Water Conservation Ordinance* (1945): controls use of mangroves.
- *Crown Lands Ordinance* (1946): established the Crown Land Committee to review and make recommendations on the allocations/use of crown lands.
- *The Minerals Vesting Act* (1966): deals with the exploitation of minerals.
- *Land Development (Interim) Control Act* (1971): established a Development Control Authority to review and determine development plans.
- *Fishing Industry (Assistance) Act No. 33 of 1972 and Fishing Industry (Assistance) Regulations No. 25 of 1973*: provides for the granting of assistance to the fishing industry.
- *Pesticides Control Act* (1975): controls use of pesticides.
- *Public Health Act* (1975) *and Regulations*: provides regulatory oversight for sewage, industrial and solid waste disposal.
- *Saint Lucia National Trust Act of 1975*: deals with the preservation of areas of natural beauty/historic interest, including submarine areas.
- *Wildlife Conservation Act* (1980): deals with the control of protected species.
- *Tourism Industry Development Act* (1981): promotes tourism development.
- *Water and Sewage Authority Act* (1984): regulates sewage treatment and disposal.
- *The Maritimes Areas Act No. 6 of 1984*: addresses some aspects of marine pollution.
- *Solid Waste Management Authority Act* (1996): makes provision for a Solid Waste Management Authority and details their function.
- *National Conservation Act* (1999): controls, maintains and develops beaches and protected areas.
- *Oil in Navigable Water Act* (cap 91): covers some aspects of oil pollution within the marine environment.
- *Fisheries (Snorkelling Licence) Regulations No. 223 of 2000*: regulates commercialised snorkelling activities.

## Annex 1

### **Primary Fisheries Legislation of Saint Lucia:**

- The first official legislation in Saint Lucia was the Turtle and Fish Protection Ordinance Cap. 45 of 1911, which was replaced by the Turtle, Lobster and Fish Protection Act No. 13 of 1971. The latter was in turn replaced by the *Fisheries Act No. 10 of 1984*. The Fisheries (Turtle, Lobster and Fish Protection) Regulations No. 67 of 1987 were then established, which were replaced by the *Fisheries Regulations No. 9 of 1994*
- *Fisheries Act (No. 10 of 1984) and Regulations (No. 9 of 1994)*, which are based on the OECS harmonized legislation, cover the establishment of a fisheries advisory committee, fisheries access agreements, local and foreign fishing licensing, fish processing establishments, fisheries research, fisheries enforcement and the registration of fishing vessels. This Act also specifies conservation measures such as prohibiting the use of any explosive, poison or other noxious substance for the purpose of killing, stunning, disabling, or catching fish; closed seasons, gear restrictions and creation of marine reserves. It gives the Minister responsible for fisheries the authority to create new regulations for the management of fisheries as and when necessary.
- In 2001, technical assistance was provided by the United Nations Food and Agricultural Organisation to review the existing legislation, to take into account more recent international fisheries agreements and the national requirements for fisheries management and development.
- A number of consultations were held with stakeholders and a proposed new Fisheries Act and Fisheries Regulations were developed. The draft Act and Regulations are in their final stages and have been submitted for finalisation by the Attorney General.

## **7. References**

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# NATIONAL REPORT OF ST. VINCENT AND THE GRENADINES

*Compiled by: Cheryl Jardine-Jackson & Kris Isaacs*

*Fisheries Division*

## 1. Fishery and Fleet Description

The Fishing industry of St. Vincent and the Grenadines is small scale and artisanal, using traditional gear, methods and vessels. The 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. Fishermen are daily operators, who go out to sea in the early morning and return to land in the late afternoon or evening.

St. Vincent and the Grenadines also has a Highseas fishing fleet comprising foreign owned vessels registered in St. Vincent and the Grenadines. The Highseas fishing fleet is of an industrial nature, harvesting tuna and tuna like species. There are thirty-two (32) such vessels fishing in the Atlantic.

**Table 1: Description of fishery in SVG. Source: Fisheries Division Data Unit 2007 - 2011**

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 20.5% of the total estimate of fish landed over the five year period (0.4 million pounds annually), realizing annual value of 3.2 million EC 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% of the landings to the local market (0.83 million pounds annually), realizing an annual value of 2.9 million dollars.
Demersals	These are fish dwelling at the sea bottom, e.g. rock hind, blem (queen snapper), groupers, parrotfish. These species contribute approximately 18% (0.34 million pounds annually) to the local market, realizing an annual value of 2.9 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 3.5% (0.064 million pounds) with an average value of 0.7 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. Estimate annual landing for shark is less than 18,000 pounds contributing about 1% of landings to the local market.
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 and Porpoises	These marine mammals are migratory, or pelagic in the case of porpoises. They give suckle to 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 while the pilot whale and other porpoises are targeted in Barrouallie and by some Kingstown fishers.

**Table 2: Description of the local fishing fleet, Source: Fisheries Division, CARIFIS 2011**

Vessel Types	Description	No. of Vessels
Flat Transoms (Bow and 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 fibreglass, 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 fibreglass 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.	390
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.	69
Multipurpose	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.	30
Others	These includes, canoes, rowboats etc.	18

*\*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.*

## 2. Statistics and Sampling

Table 3 QUICK FACTS TABLE	
<b>Per Capita Consumption</b>	16.7 lbs annually (Average fish landings 2007-2011*).
<b>Socio-Economic</b>	1.7 % contribution to GDP 2,500 full and part time fishermen 500 vendors, traders, gutters, etc. 750 registered fishing vessels (CARIFIS Jul 2011) Average cost of fishing vessel with gear: \$15,000.00 Estimated investment in the fisher: \$10 million
<b>Fish Landings and Export</b>	Approximately 1.8 million lbs of fish landed annually (2007-2011*)  Approximately 0.2 million lbs of fish exported annually (2007-2011*)
<b>Physical Characteristics</b>	Land area—345 square kilometers EEZ—27,500 square kilometers Shelf area—7,800 square kilometers

\*Source: Fisheries Data unit

The level of infra-structural development at the various landing sites throughout the state has improved significantly over the last two decades. In 1992, the New Kingstown Fish Market (NKFM) was the only landing site with marketing facilities such as, vending stalls, ice machines, chillers, *etc.* Today, similar facilities now exist in Paget Farm, Bequia; Britannia Bay, Mustique; Friendship, Canouan; Clifton, Union Island; Calliaqua, Barrouallie, Chateaubelair and Owia, St. Vincent.

The landing sites are zoned and categorized (stratified). There are seven zones and thirty six (36) landing sites. Categorically, a site is designated as either primary, secondary or tertiary. The assignment into any one of these categories is based on three main variables, i.e., the number of fishing boats that regularly land fish at the site; the amount of fish landed; and the level of infra-structural development. There are two (2) primary sites (Kingstown and Barrouallie); fourteen (14) secondary and twenty (20) tertiary sites. In addition to these on-shore landing sites, several trading vessels take fish directly from the fishermen and they are also classified as landing sites.

The catch and effort data follows a stratified sampling methodology. In this approach the sampling frame (which is all the identified fish landing sites within the country) is first partitioned into groups or strata, and the sampling is then performed separately within each stratum. This method combines the conceptual simplicity of simple random sampling with potentially significant gains in reliability.

The sampling units (landing sites) are stratified prior to sampling into three groups (primary, secondary and tertiary) based on the variables mentioned above. The technique of simple random sampling is then used to select the days of the month each landing site is sampled. Sampling is not carried out on Saturdays, Sundays and major holidays, nevertheless, every day is considered as a potential fishing day.

This simplifies data analysis and does not seem to be a great source of error since fishermen fish whenever they can regardless of what day it is.

An estimate of the amount of fish landed in the country is obtained by summing the totals of all the estimates for the individual landing sites.

The Highseas tuna fishing vessels flagged with St. Vincent and the Grenadines and operating within the ICCAT Convention Area generally land and trans-ship their catches at two major trans-shipment ports in Trinidad and Tobago. While there is ongoing collaboration and good communication with ship owners for obtaining fishery statistics, St. Vincent and the Grenadines sees the need to establish an independent port sampling programme to verify landings and trans-shipping activities at these ports. For this purpose, St. Vincent and the Grenadines have submitted a proposal to ICCAT to establish a 12-month sampling programme at Trinidad and Tobago's trans-shipment ports.

**Table 4: Summary of the St. Vincent High Seas fleets. (Source: Fisheries Division)**

<b>Type of data and information</b>	
Numbers of vessels	32 (2011)
Number of vessels > 24 m LOA	14 (2011)
General fishing areas	Two main areas: (i) Between 5 - 20° N and 30 - 60°W (ii) Between 20 - 30° S and 30 - 45°W
species landed 2000 - 2010	Yellowfin tuna, Albacore, Big Eye tuna, Skipjacks, Sail fish, Kingfish, Dolphin fish (Mahi mahi), Spear Fish, Sword fish.
Average annual catches (MT) of major tuna species 2000-2010	3,404
Key landing / trans-shipment locations	Port of Spain and Chaguaramas (Trinidad and Tobago)

### **3. 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

**Table 5: Fishery Types and Management Objectives**

<b>FISHERY</b>	<b>TARGET SPECIES</b>	<b>OBJECTIVES</b>
Shallow Reef Fishes	Hinds, parrotfishes, squirrelfishes, grunts, surgeonfishes, triggerfishes	To promote stock recovery by <ul style="list-style-type: none"> <li>• encouraging fishers to fish further off-shore</li> <li>• continue to enforce the fisheries laws as it relates to destructive fishing practices</li> <li>• not increasing the current effort of harvest</li> </ul>
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 member 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 <ul style="list-style-type: none"> <li>• the Closed season.</li> <li>• Conservation areas</li> </ul>

		<ul style="list-style-type: none"> <li>• Size limits</li> <li>• Restrictions on moulting</li> <li>• Berried lobsters</li> <li>• Certain harvesting practices (“Scrubbing”)</li> </ul>
Conch	Queen conch	Rebuild stocks in depleted areas by continuing to observe <ul style="list-style-type: none"> <li>• Minimum size limit</li> <li>• Closed areas</li> </ul>

#### 4. Research

Over the years the Fisheries Division has done research in the areas of (1) fish use to determine how many people in St. Vincent and the Grenadines prefer fish to other animal protein (2) the assessment of red hind (*Epinephelus guttatus*) fishery to determine the abundance and distribution.

At present the Division is involved with the fleet expansion programme which is designed to encourage fishermen to upgrade their fishing fleet with safety requirements, which will allow them to target higher valued species and hence improve productivity and their livelihood.

The National Sea Turtle Conservation Programme which aims to conserve the present nesting and foraging populations of the sea turtle in SVG.

A recent study of the marine habitat was conducted through ecological surveys conducted at 15 sites throughout St. Vincent and the Grenadines. Data was taken on fishing communities, invertebrate populations, reef structure and health as well as the status of other benthic coverage.

In the near future the division will be embarking on several other research initiatives such as the lobster and conch abundance and distribution survey because of a noticeable decline in catches. Also monitoring and data gathering will be done on two artificial reefs which are located in the Grenadines. One of the artificial reefs is located in Bequia and the other in Mustique.

#### 5. Legislation and Management Regulations

The Fisheries of St. Vincent and the Grenadines has the following 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, covers, 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.

# NATIONAL REPORT OF SURINAME

## **1. Fishery and Fleet Description**

Suriname fisheries can be divided into two main groups - the industrial trawl and the artisanal fleets. The industrial fleet can be divided into the sub-categories: fin fish fishery and shrimp fishery. The artisanal fishery is more diverse with the biggest group of fishers consisting of at least 1200 fish catching units in different categories. The industrial trawl fishery is composed of bottom trawlers and shrimp trawlers. The management system specifies the maximum number of boats which could operate in a designated fishery category.

### **1.1 Industrial Trawl Fishery**

#### 1.1.1 Shrimp Fishery

The maximum number of vessels allowed for the shrimp bottom trawl, operating in depths greater than 45 fathoms (81m) is four. The targeted species are orange shrimp, royal red shrimp and scarlet shrimp. One regulation is that this fishery has to operate with a turtle excluded device (TED). When one compares the practical side of this regulation and how this regulation is enforced in the USA, a discriminatory element is encountered. Besides the practical difficulty of the effect of depth, streaming speed and the so call tumble net (rolled net) it is noticeable that deep sea shrimping in the USA is exempt from the obligation to use TED for the operation or targeting royal shrimp and rock shrimp which are likely to be found in depths greater than 200M. So the government of Suriname is taking a closer look at this issue to modify this regulation. The configuration of the net is set as follows in the regulation and all the measurements are given in mm and stretch mesh size:

- The body of the net mesh size- 57mm
- Wings- 57mm
- Corners- 57mm
- Sack- 45mm
- Maximum hp- 500

All the Industrial vessels must have a VMS on board which is in working order. However, not all the industrial vessels are yet equipped with this device, especially those involved in the line fishery category. There are also instances in which vessels do not pay their yearly fee to use the VMS. To counter this problem and the problem of illegal fishing of domestic and foreign vessels, the Ministry is putting in place a VMS verification or monitoring system. This system will consist of monitoring or verification of VMS positions and real time positions, but more importantly is the gathering of information of boats in the direct or indirect surroundings of the legal ones, in order to identify illegal boats operating in the area; boats operating without VMS; and other intelligence which could at least assist in estimating the level of the illegal operation and the take of these operation. The minimum size to be caught by all shrimp trawlers is set at 10 cm total length, but the issue here is that there is no percentage or amount given which could be landed as part of incidental catch. However, it is unlikely that the government will fine a boat which is landing four ton of shrimp and only 100 kg of which are under 10 cm.

Another obligation which is also found in the licensing conditions for the industrial fleet is that they are obligated to accommodate at least 2 (two) observers upon request by the government. The functioning observer program has the following shortcomings - there is a shortage of observers and the observer data are not processed properly. The minimum coverage of 10% of sea days per fleet category can never be reached. Furthermore, there is a lack of understanding of the data; the perception that data is always good

and that all the data can be used is still rampant. There are not enough qualified personnel that can oversee the system in which collected data must be used and the quality of data needed to perform certain tasks or calculations according to certain standards. The review of the data collection system shows that data are collected for the use of hand calculations instead of automated systems. Data collection and processing will remain an issue until a standard manual is design and implemented. It will then be clear which data must be collected for which purposes.

The maximum number of vessels operating in depths greater than 15 fathom (27m) is thirty. The target species of this category are *Penaeus brasiliensis,-notatis,-subtilis,-schmitti* (hopper, pink, brown and white shrimp).

The maximum number of seabob trawlers operating in depths of 10 to 18 fathoms (18m-32.4m) is twenty-two. The target species is Atlantic seabob (*xyphopeneus kroyeri*). Besides use of a TED, it is also mandatory that the gear be fitted with a Bycatch Reduction Device (BRD), which is in keeping with the terms of MSC labelling of the seabob fishery. This regulation is viewed as burdensome on the seabob fisheries and is discriminatory compared to other shrimp fisheries since the bycatch generated by the seabob fishery has always been far lower than other shrimp fisheries. The deployment of the original shrimp net in an upside down position is giving a lot of fishes the opportunity to escape the net and this is why the seabob fishing gear has a different selectivity than the shrimp net. It is not correct to say that the seabob fishery is using the same net as the shrimp trawling as they do therefore not have the same selectivity. A lot of the misunderstanding about the bycatch of seabob has its origin in this misconception.

### 1.1.2 Finfish Fishery

The maximum number of vessels allowed in the finfish bottom trawl fishery which operates at depths greater than 15 fathoms (27m) is twenty-three. The target species are all the demersal species and the gear is bottom trawl net. The maximum number of days at sea is 200 and a maximum hp of 500. The bottom trawl net specifications in stretch mesh size are:

- Body-120mm,
- Wings-160mm,
- Corners-100 mm
- Sack -80mm

There was also a small pelagic class, but this category is not used anymore because it was recognized that it targeted the same species as the bottom trawls. The introduction of this class is a reminder of how management can lose perspective of its real objectives. There was a limit for bottom trawl vessels at that time. This limit was established after stock assessments undertaken at WECAFC. The way around this limit was to create a group under another name and pretend that they are targeting different species. This example or practice is one which can be found in a lot of countries where the fishery is sometimes used as a political tool. The question remains - how to reduce the fleet to less than 18 vessels. The limit of 200 days at sea is more an upper limit than a real reduction of the effort, since only 5 vessels were capable of having more than 200 days at sea. Most of the vessels don't even reach 180 days at sea. The 500 hp is in place because of the theory of sweeping power -the bigger the hp the bigger the net. The problem with this rule is that we do not have the technical expertise to monitor this in an adequate manner. The impression is that we are being fooled by the boat owners as they have more technical qualification. The Ministry is aware that the system must function better and it can if we increase the capacity of human and technology. But we are also proud to establish the fact that we have a better functioning system than many nations with a higher GDP than ours.

The maximum number of vessels allowed in the large pelagic line fishery is 60 and the depth to fish is greater than 28 fathoms (50.4 m). The target species are sharks and tuna and tuna like species and hook and line is the only gear with a maximum of 2000 hooks on horizontal lines and a minimum hook number 5. The maximum power is 1000 hp. This regulation of maximum horsepower is not here because of the sweeping power but more in the ability to move from one place to the other to deploy hooks.

This category of fishery is the most challenging one since it contains species that are threatened or endangered. Furthermore, most of them are under RFMO regime. This year is the first time Suriname will participate in the LPWG at the CRFM scientific meeting in St. Vincent. Monitoring of the landings of these species at our ports has just begun. We are now in the process of setting up a system which will enable us to fulfil the reporting requirement of ICCAT. But at the Ministry there are only two persons employed with a fishery background. There is an aquaculturist and a fisheries officer. The system for monitoring tuna and the human resource needed to comply with the ICCAT requirement is not yet in place. We are hoping for a helping hand from Trinidad, Belize, St. Vincent and others of the Caribbean community. We could send our personnel to one of these countries to see how their systems are functioning.

The maximum number of vessels allowed in the line fishery (red snapper/mackerel) is 100. The area of operation is 10 fathoms and deeper (18m) and the target species are all the snappers species and mackerel. There are two categories for snapper and mackerel:

- Snapper requirement
  - Target species *lutjanus synagris*, *lutjanus jocu*, *lutjanus aurorubens* etc.
  - Gear 2000 hooks on horizontal line and 20 on vertical line
  - Maximum 14 vertical hand line and hooks numbers 6,7,8
  - Maximum power 400 hp.

The maximum hp is different than that of the pelagic fishery, although the reason for this difference is not clear, but may have to do with the traditional red snapper boats which are Venezuelan vessels. What is new in this category is the maximum length of 30 meters. Again it can be seen as a traditional issue here.

- Mackerel requirement
  - Target species: king mackerel, wahoo, sailfish, dolphin fish, etc.
  - Gear lines and only lines with 2000 hooks on horizontal lines and 20 on vertical hand lines but hooks numbers for this category are 3,4,5,6,7.

There is one more special requirement for these two categories besides the maximum length of 30 meters; there is a limit on maximum carrying capacity of 40 tons inclusive of ice and catch.

There is a misunderstanding that Venezuelan vessels are allowed to fish in Suriname territorial waters. This conception is not completely true as they can only fish in Suriname territorial waters on behalf of a Surinamese agent.

## **1.2 Artisanal Fishery**

The last and biggest category of all is the artisanal fishery which operates on the sea coast with different gears, dominated by driftnet. The target species are not defined and the area of operation is greater than 9 fathoms (16.7m) except in the closed area during breeding season of the turtle. The gear mesh size for beach seine is a minimum of 5 cm or 2 inch stretched. The beach seine does not operate in depths greater than 9 fathoms.

The gear specification drift net is 8 inch given that maximum 30% of the net can also have 5 to 6 inch mesh size. The total length of the nets must not be larger than 2000 meters. This restriction creates a

dilemma again. The fishers are accustomed to putting two of these nets together to form a complete net of 4000 meters. In the old days the nets were not that long. The nets have expanded from 500 meters to 4000 meters and the mean catch has dropped from 3 to 4 tons to a mere 1200 kg.; with a median of about 900 kg. The increase in the cost of fuel and the stable fish prices severely impact the economic returns to the artisanal fishers. However, they have been able to neutralize the negative outgoings with earnings from a sharp increase in price and demand for fish bladder or glue as the fisher calls it. The price of 1 kg of this fish 'glue' is approximately US\$135; while 1 kg of sea trout is barely US\$2. There are rumours and official report from observers stating that some fishers, especially an industrial group, are throwing fish away after they have removed the fish bladder. This is how dynamic fishery is when you think you have seen it all just look again. This is a new challenge for the Fisheries Department since the situation calls for a new policy.

The bangamary fishery uses driftnet with mesh sizes 3.5 inch and 2000 m length and the fishing area is between 5 and 9 fathom (5.5 -9 meter).

The inland water or river estuarine fishery uses different gears type but again dominated by driftnet. The gears in this category include fuik, drift net, line and the operating area is estuarine and rivers.

The far inland fishery or swamp or sweet water fishery uses divers and there are no limitations in this fishery.

A lot of numbers and regulations have been presented, but the question remains can estimates be extracted out of this all. Well we can get some limits. Let us take as an example the seabob fishery. There were 30 licenses reserved for this fishery and only 23 were used. Now we have 22 licenses, one less than the number of active boats and we are not interested in the 7 dormant boats. We can then calculate the potential decrease in effort if we have other statistics as means or median of days at sea. We can then look at the total effort to see if we can find the potential effort decrease which should be the result of having one boat less in service. The core of this thinking for management is to measure the real effect of management measures and the absence of data for certain models should not keep us from putting certain measures in place.

Production by broad categories within the past five years is provided below:

- Shrimp production between 500 to 800 ton per year
- Seabob production between 6,000 to 8,000 ton per year
- Fin fish industrial production between 5,000 to 6,700 per year
- Artisanal fish production between 23,000 to 25,000 ton per year
- Snapper / mackerel production between 800 to 1,800 ton per year

The total production of wild capture marine species in Suriname can be estimated to be 42,300 tons maximum.

# **NATIONAL REPORT OF THE TURKS AND CAICOS ISLANDS**

*Prepared by: Kathy Lockhart*

*Department of Environment and Maritime Affairs,  
Ministry of Environment and District Administration, TCI*

## **1. Introduction**

The Turks and Caicos Islands (TCI) has continued to collect data in the various fisheries since the early 1940's and in some case even earlier. Most recently, the TCI has gone through political changes with the intervention of the United Kingdom based on allegations of corruption. This in turn has caused for the suspension of the Constitution and reform of the entire civil servants and much of the government structure. However, with the continued collection of data, the TCI continues to be able to assess the fisheries and provide recommendation to the management authorities for how best to manage the fisheries.

It was recommended by the Governor that the TCI make attempts to gather more information with regards to the *Strombus gigas* (Queen Conch) fishery. This was to include a 2nd Underwater Visual Census, Local consumption via restaurant purchases and more socio-economic information. Unfortunately, the Department of Environment and Coastal Resources (DECR) no renamed Department of Environment and Marine Affairs (DEMA) has been unable to complete each of these tasks. There has been much work in contacting local restaurants for domestic consumption, but very little information has been submitted by the restaurants. The TCI Government budget was to be passed in April of 2012 and has yet to be passed in early June of 2012. Based on the inability of the department to obtain proper funding, both tickets and consumables have yet to be purchased and this has slowed production.

However, the TCI has continued to collect information on landings, effort and export of both the Spiny lobster and the Queen Conch. Again, as stated in previous reports, the fin fish is capture for domestic consumption and collection of this information has proven difficult from the recreational fishers.

## **2. 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 has been used very sparingly from the local fishers for the purpose of capture of fin fish. The vessels most often utilized in the TCI are small retrofitted V-hull boats ranging in length from 18ft - 20ft with 85 - 115 hp out board engines. Large vessels rigged with electronic reels and / or traps have been repaired, but are currently being used. There has been discussion of the need to have a "Turks Islander" on board, but the current administration has steadfast to the current regulations, and a "Turks Islander" is required on every commercial fishing vessel.

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. Last year the TCI elected to extend the closed season for spiny lobster. The season was to open 1 September and close on 31 March. Unfortunately, the government decided to allow the season to remain open until April 30. The extension voided the purpose of the extension of the closed season. It has now been decided that the season for Spiny lobster will open 1 August and close 31 March as it is stated in the Fisheries Protection Ordinance.



During the open season of lobster, fishermen largely capture spiny lobster and land them whole. In past few years, fishers have tended to work the Spiny Lobster fishery throughout the season and at the end turn to the queen conch fishery. At the completion of both the Spiny Lobster and Queen Conch fisheries, fishers again re-prioritize capture and actively work the fin fishery for the local market.

Within the past ten years, the commercial fisheries have directly employed an average of 365 fishers per year. In 2010 / 2011 fishing season, the number of commercially licensed persons was at 288. Similarly the number of commercially licensed vessels average at 158 licensed vessels but in 2008 / 2009 there were 126 commercially licensed vessels.

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

### **3. 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.

Currently Fisheries Policies and Legislation is under review. Various recommendations to amend the legislation have been made to the Governor's Council. Until Legislation or Policy has been changed it remains as previous documented in National Reports.

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:**

- Ensure that the catch in any one-year does not exceed the Maximum Sustainable Yield.
- Restore and maintain populations of marine species to sustainable levels.

- Conserve local populations of endangered species and ensure sustainable harvesting and trade.
- Promote and enhance scientific research capabilities in order to obtain relevant information on the fisheries resources such as carrying capacity, stock status, etc.
- Enhance income generation by a factor of 15% by improving and creating market opportunities for fish and fish products at the national, regional and international levels.
- Ensure that the benefits from the exploitation of the fisheries resources are optimized by Belongers.
- Promote diversification in resource exploitation of the TCI fisheries.
- Streamline, monitor and regulate the importation of marine products.
- Establish mechanism to reduce over-capitalization in the fishing industry.
- Develop and seek opportunities for resource users to obtain financial assistance /credit from credit agencies.
- Achieve environmental and developmental awareness of marine resources in all sectors of society from primary school through adulthood.
- Ensure that post harvest handling, processing and distribution of fish and fishery products is carried out in a manner that maintains quality, nutritional value.
- Develop and implement food processing and handling guidelines/regulations for quality assurance.
- Improve the manpower and resources of the Fisheries Division to ensure effective monitoring, control and surveillance of fishing activities.
- Promote and maintain a “Zero Tolerance” in enforcement of the legislations.
- Develop and Implement strategies to deter and combat Illegal, Underreported and Unreported (IUU) fishing in the waters of the Turks and Caicos Islands.
- Improve stakeholder participation in the management of the marine resources.
- Achieve inter and intra-agency collaboration on the matters that may affect the fisheries resources and associate habitats.
- Improve relationship with other Overseas Territories in the management of the marine resources and the environment.
- Improve TCI’s collaboration and participation in regional and international initiatives in the management of the fisheries resources.
- Promote talks to delineate and conclude maritime boundaries discourse between the TCI and The Dominican Republic as well as The Bahamas.
- Develop and implement mariculture/aquaculture guidelines and regulations.
- Promote and encourage mariculture/aquaculture of indigenous species of invertebrates and fish as a means of diversifying income and diet.
- Achieve environmental and developmental awareness of marine resources in all sectors of society from primary school through adulthood.

## **4. Research**

### **4.1 Monitoring Activities**

The recent changes to the civil service and merging of the DECR with Maritime have made it impossible to increase any monitoring activities of the TCI at this time. However, the new Department has been able to continue the original data collection scheme of the fisheries. The following activities continue:

- Catch and effort data for spiny lobster, queen conch and 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. Spiny lobster also has individual biological information collected. Captains are then interviewed for the number of days at sea, number of crew, location, etc.

- Export data for all marine products is monitored.
- 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 utilize 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.
- Initializing the collection of domestic seafood purchased by local restaurants. Restaurants have been contacted and some submissions have been obtained.

The following activities the DEMA would wish to continue upon obtaining proper funding:

- The Department of Environment and Maritime Affairs intends to collect local consumption data of marine products to determine the seafood consumption rate, after the completion of the current 2012 TCI Census.
- Upon receipt of proper funding, DEMA will conduct a second Queen Conch Visual Survey to assist in the stock assessment and analysis of the species.
- Although the Department have conducted numerous socio-economic surveys in the past, this research approach for the most part have been underutilized. Many of the socio-economic surveys have been in collaboration with individuals and or institutions, looking at the following:
  - Social Capital
  - Resource utilization
  - Local consumption

## **5. 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).

The Department has recently been able to amend sections of the Ordinance to include:

- No person shall take, have in his possession; buy or sell any parrot fish.
- No person shall export conch during the period commencing on the fifteenth day of July and extending to and including the fifteenth day of October in each year.

### **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.