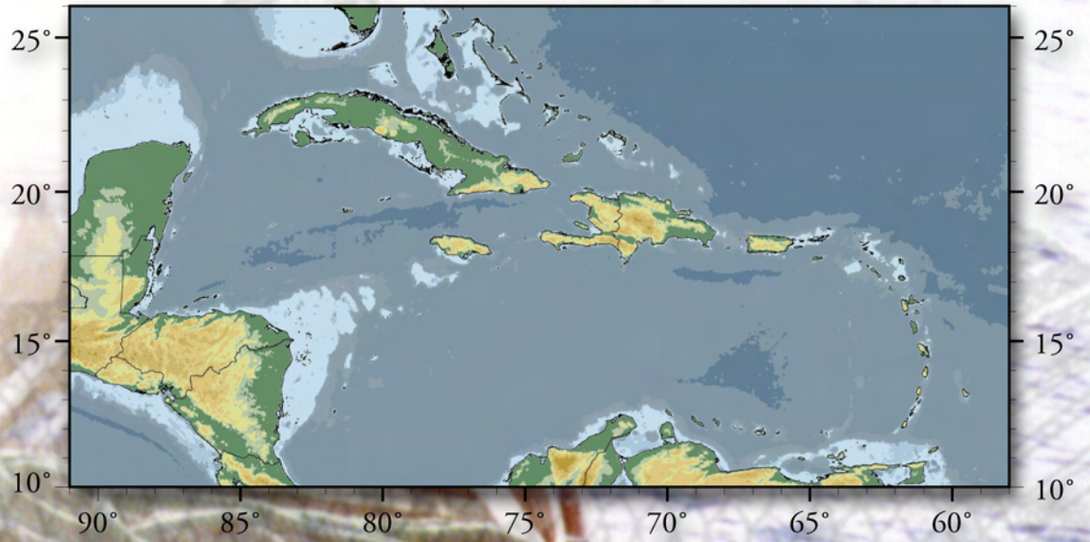
CARICOM Fishery Report No. 4

Caribbean Community Secretariat

CARICOM

Canadian International Development Agency

CARICOM Fisheries Unit



Jamaica

National Marine Fisheries Atlas

CARICOM Fisheries Unit, Belize City, Belize

Canadian International Development Agency

CARICOM Fisheries Unit

Government of Jamaica

CARICOM Fishery Report No. 4

JAMAICA NATIONAL MARINE FISHERIES ATLAS

produced by

CARICOM Fisheries Resource Assessment and Management Program
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A Note to the Reader

This atlas is a compendium of facts and figures about the fisheries of Jamaica. Because of this, a reader would not be likely to read systematically from front to back. While one given reader may be interested only one particular species of fish, another may be interested in many aspects of fishing. To help readers with different requirements, some of the information is actually presented more than once, but each time it is organized and presented to convey a different aspect of the fisheries.

The first section, the Introduction, provides the basic background about the country and the fisheries place in it, economically, biologically and legally. It also provides the lay reader with some of the specialized vocabulary of fisheries. The next section, national statistics, provides summaries of fisheries data collected over the whole country, presented with figures, photos and drawings. The final section deals with more details about the specific fisheries, by species or species group, and some of the pertinent biology.

A Glossary of Useful Terms

Algae: simple one-celled, single celled or simple multicellular organisms plants, capable of photosynthesis; usually aquatic.

Benthic: bottom dwelling; occurring on the sea floor, whether in shallow or deep water.

Brackish: referring to water which is between fresh and marine waters in salinity. Usually a result of mixing between freshwaters such as rivers with enclosed marine waters such as bays or lagoons.

Carnivore: animal feeding mainly or entirely on the flesh of other animals.

Cartilaginous: tough white flexible firm tissue that functions as bones in sharks.

Caudal fin: a fish's tail fin.

Cephalopoda: the class of molluscs with tentacles, e.g. squid, octopus.

Crustaceans: hard shelled aquatic animals including crab, lobster and shrimp.

Dorsal fin: the fin running down the centre of a fish's back.

Ecosystem: all the living and non-living things in an area of any size.

Exoskeleton: when the body's main support is situated externally, usually in the form of a shell, e.g. lobster and crab.

Filamentous: slender, threadlike.

Gastropoda: the class of snail-like molluscs, e.g. conch.

Iridescent: showing colours like those of a rainbow.

Invertebrate: an animal without back bone.

Growth Overfishing: occurs when a fishery captures fish or other species before they have grown to their full potential, resulting in a reduction in yield.

Lagoon: shallow stretch of salt water partly or wholly separated from the sea by a narrow strip of land, low sandbank or coral reef.

Migratory: a species which moves periodically from one area to another then back again as a natural part of life.

Operculum: the uppermost and largest of the bones that form the gill cover of a fish.

Pectoral fin: paired fins present on the fish's side situated just behind the gills.

Pelvic fin: paired fins usually situated below the pectoral fins in the pelvic region.

Plankton: small plant and animal organisms which are found floating in aquatic environments.

Recruitment: the production of a new generation of marine species.

Recruitment Overfishing: occurs when a fishery captures fish or other species before they have matured and reproduced, resulting in depletion of the population.

Scutes: well developed bony scales often with a spine, located along the belly or towards the rear of the body.

Sea weeds: various kinds of marine vegetation, eg. seagrasses.

Species: a population of individuals who are more or less alike.

Vertebrate: an animal with a back bone.

Acknowledgements

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- CFRAMP
- Mr. Karl Aiken (providing many of the photographs)
- staff of the Fisheries Division (time and effort in providing the information)
- Meteorology Office (Mr. Mulung)

Credits

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(4) Crocodile Specialist Group for photographs of the American Crocodile. (*http://www.flmnh.ufl.edu/natsci/herpetology/crocs.htm*)

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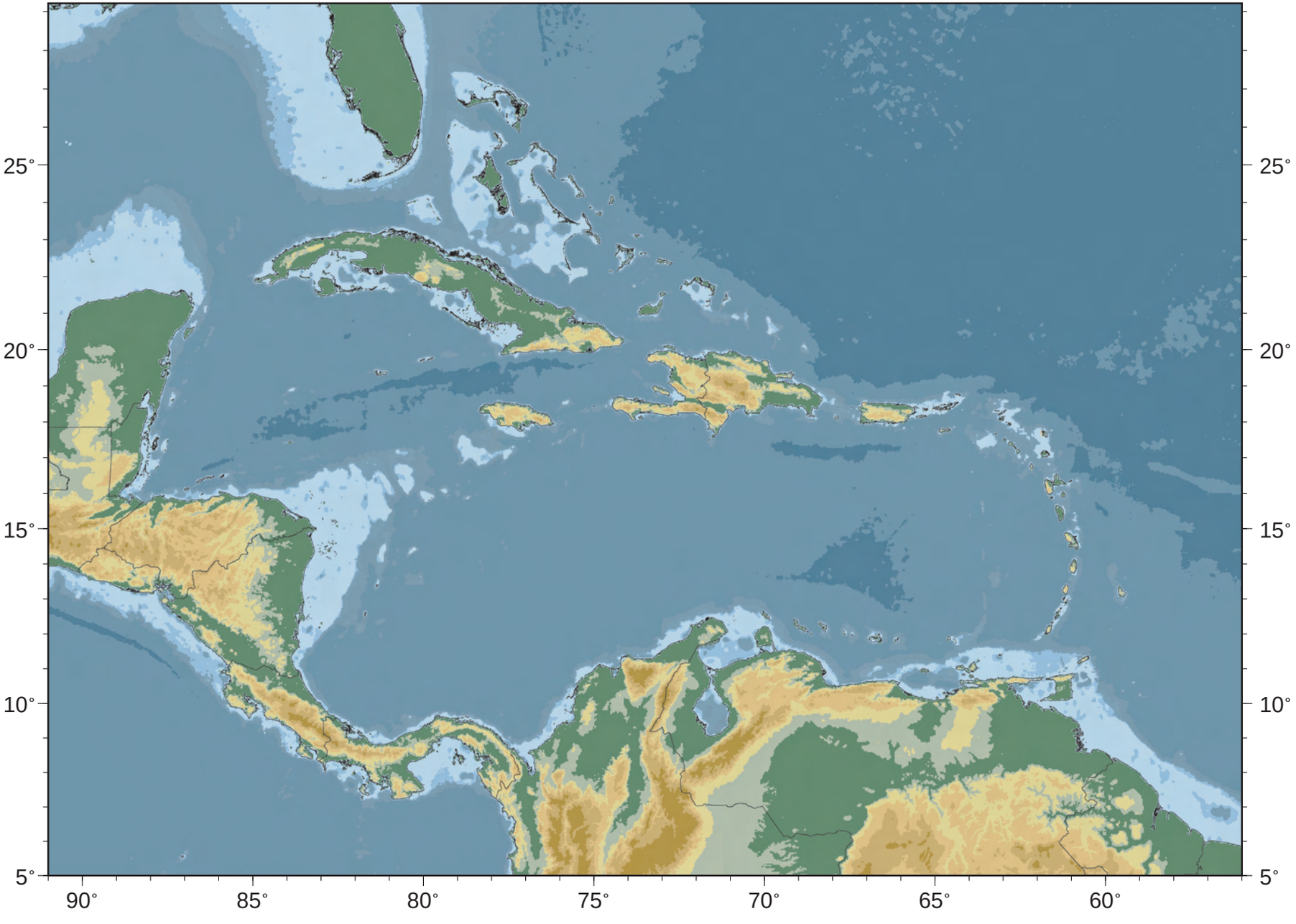
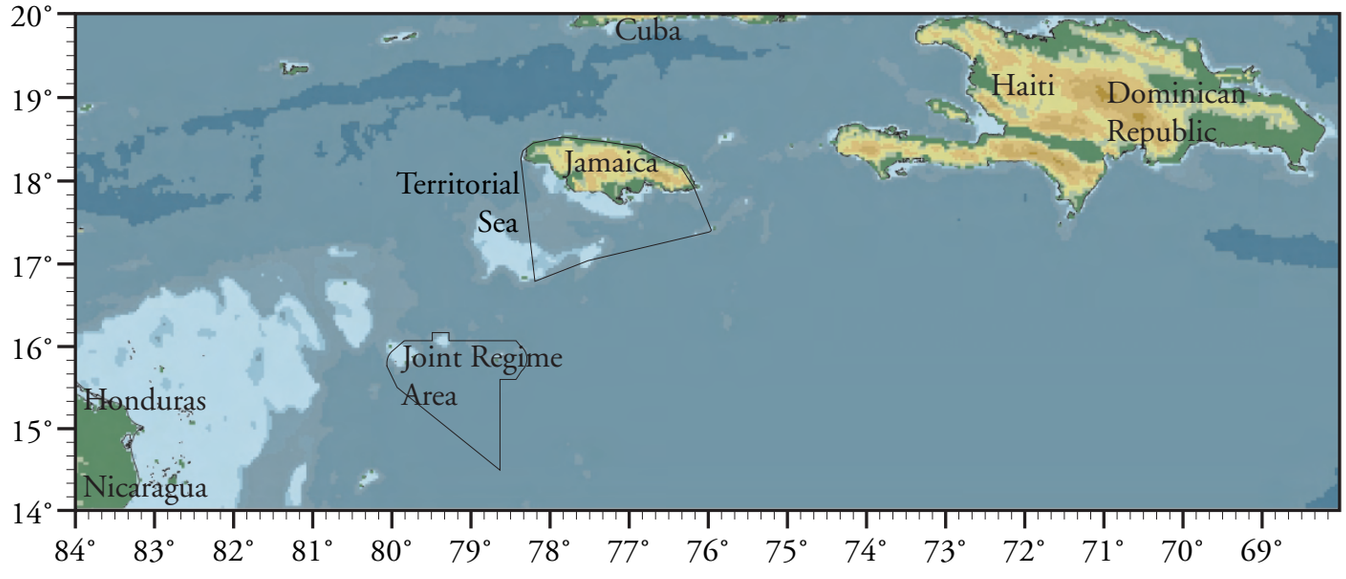
Map of the Caribbean Region



Country Profile



Regional Position of Jamaica including delimited territorial waters and the Jamaica-Colombia Joint Regine Area

Geography

Location: See regional map

Area: 10,990 km^2

Coastline: 1,022 km

EEZ: 200 nm, coordinates of the EEZ have not been delimited

Territorial sea: 12 nm

International dispute: none

Climate: tropical; hot, humid; temperature interior

Terrain: mostly mountains with narrow, discontinuous coastal plain

Natural resources: bauxite, gypsum, limestone

Environment: subject to hurricanes (especially July to November); deforestation; water pollution

Marine environment: tidal range - 20-30 cm; surface temperature 26.5-29.5^{0}C; surface salinity 35.2-35.8 ppt.

Population: 2,527,700 (1996)

Population growth rate:1% (1996)

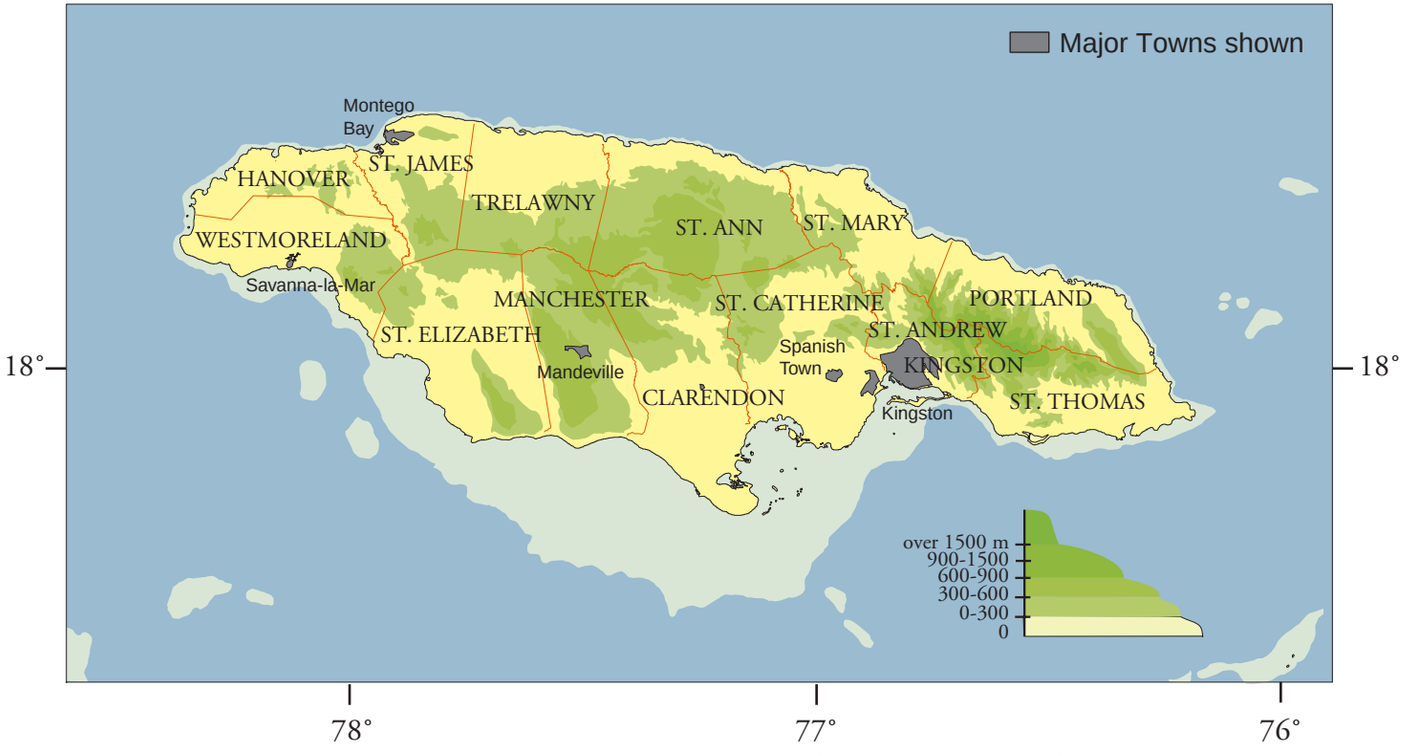
Population density: 230 persons per km^2

Ethnic division: Negro/Black 90.5%; East Indian 1.3%; Chinese 0.2%; White 0.2%; Mixed /Negro 7.3%; other races 0.6% (1991)

Language: English, Creole

Literacy: age 15 and over having ever attended school (1990)

Labour force: 1,149,400 by occupation: agriculture forestry & fishing 23%, mining 1%, transport, storage & communication 5%, construction 8%, electricity, gas & water 1%, manufacturing 11%, community, social & personal services 25%, wholesale & retail, hotel & restaurants services 21% (1995).



Political boundaries, major towns, and topographic elevation of Jamaica (map data from NRCA Data unit)

Government

Type: parliamentary democracy

Capital: Kingston

Administrative division: 14 parishes; Clarendon, Hanover, Kingston, Manchester, Portland, St. Andrew, St. Ann, St. Catherine, St. Elizabeth, St. James, St. Mary, St. Thomas, Trelawny, Westmoreland

Independence: 6 August 1962 (from UK)

Constitution: 6 August 1962

Legal system: based on English common law; has not accepted compulsory ICL jurisdictions

Suffrage: 18 years of age; universal

Elections: House of Representatives: last held 30 March 1993 (next to be held by March 1998);

Executive branch: British monarch, governor general, prime minister, Cabinet

Legislative branch: bicameral Parliament consists of an upper house or Senate and a lower house or House of Representative

Judicial branch: Supreme Court

Leaders:

Chief of State: Queen Elizabeth II (since 6 February 1952), represented by Governor General Sir Howard Cooke (since 1 August 1991)

Head of Government: Prime Minister P.J. Patterson (since 30 March 1992)

GDP: 5.8 billion (1996)

Contribution to GDP: Industrial (30%), agriculture (7%)

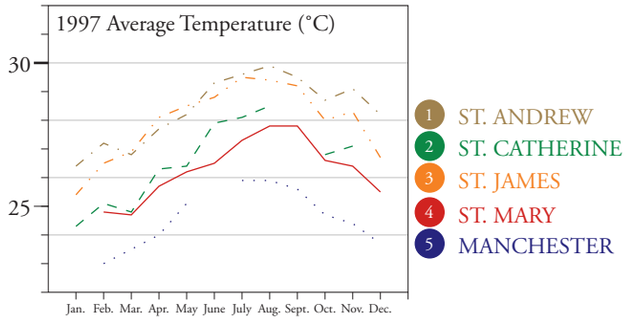
National product real growth rate: 2% (1994)

National product per capita: 87.8 (1994)

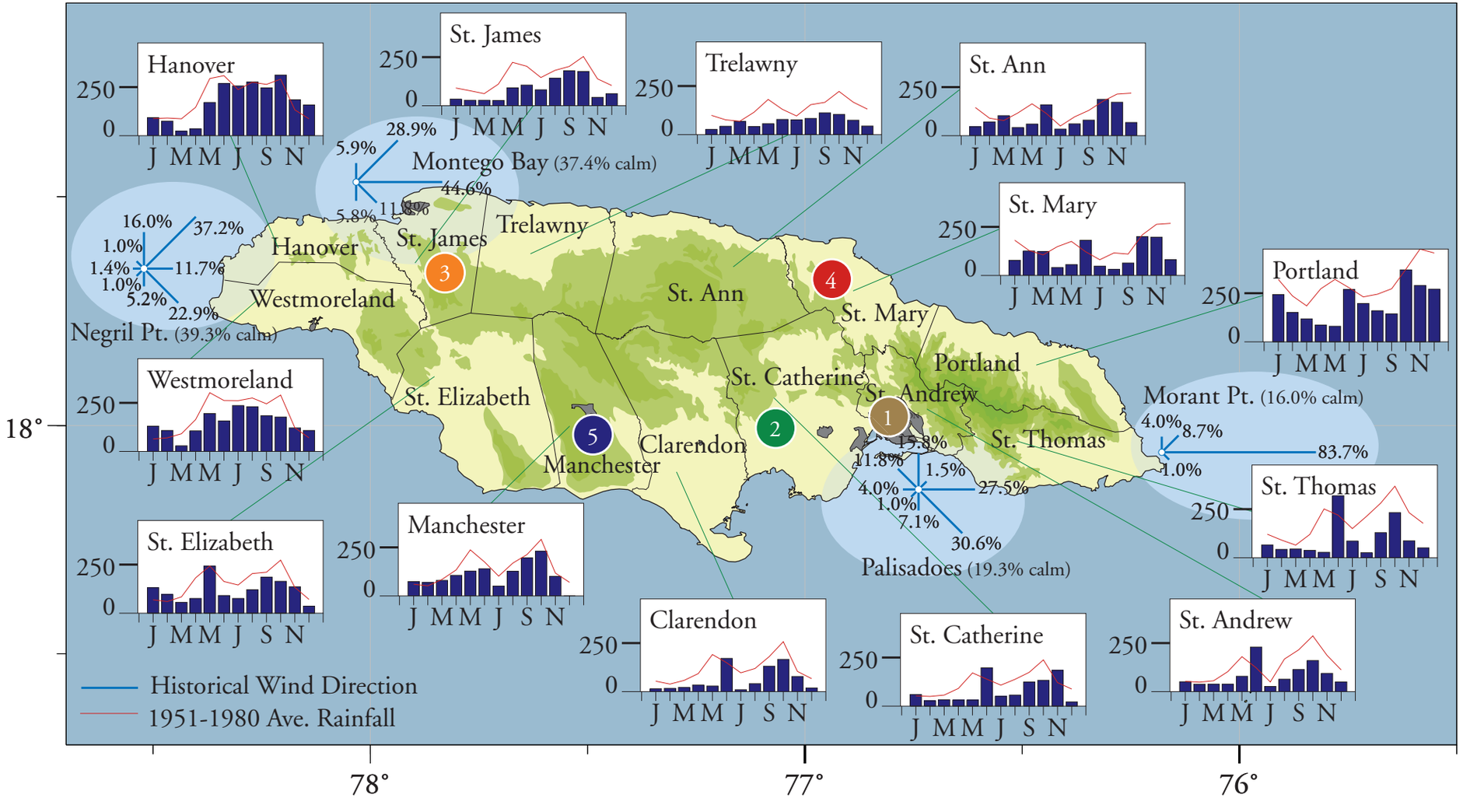
Inflation rate (consumer prices): 15.8% (1996)

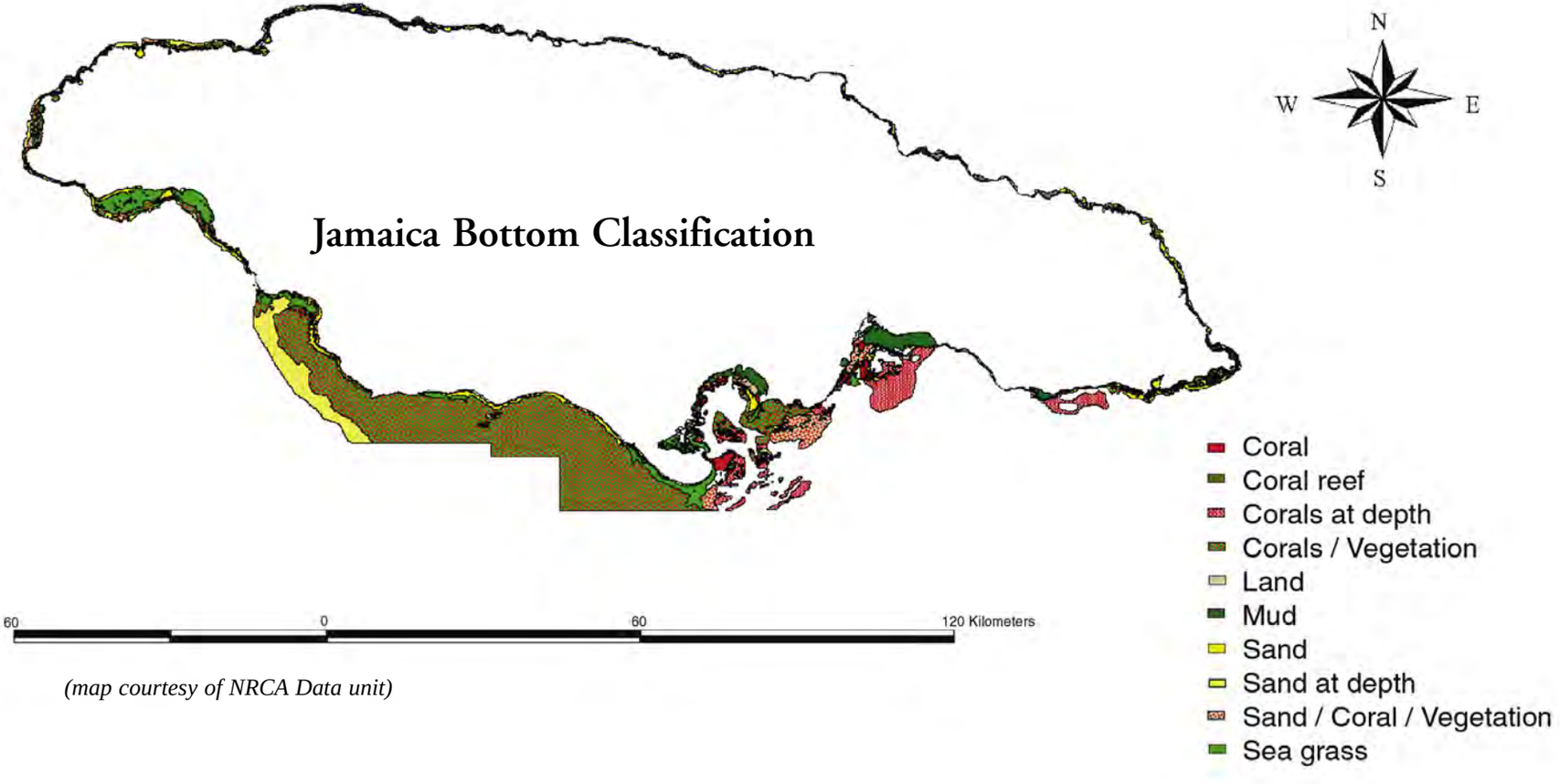
Jamaica Climate Profile

Mean Temperature for 1997 (°C) for five Jamaican parishes.

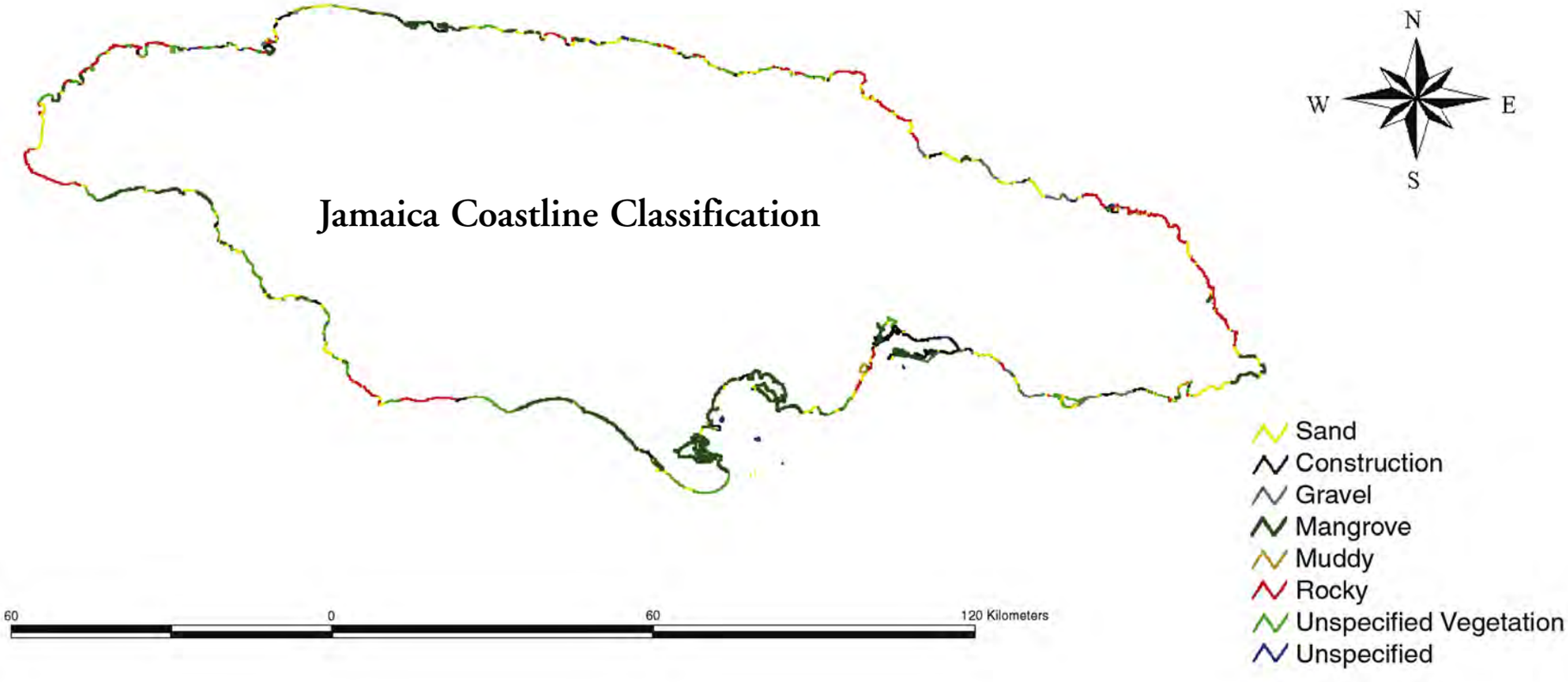


Monthly Mean rainfall for 1997, long term mean rainfall (mm) for Jamaica by parish, and historical wind direction for four selected sites.





(map courtesy of NRCA Data unit)



(map courtesy of NRCA Data unit)

Legal Framework

As in all countries, the fisheries of Jamaica are subject to a legal and regulatory regime intended to protect the interests of all Jamaicans with respect the country's fisheries and marine resources. The primary legislation is that enacted for the express purpose of regulating the fisheries. Here it is the Fishing Industry Act of 1975. Giving effect to the general provisions of the Act are the Fishing Industry Regulations of 1976. These two pieces of legislation include provisions for licensing of fishers and vessels, specify the seasons and areas for each type of species and method of fishing. They govern fisheries within the territorial sea and archipelagic waters of Jamaica.

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

In addition to the primary legislation, fisheries are impacted by various other Acts and Regulations of the Jamaican government pertaining to wildlife and natural resource conservation, environmental protection, economic and infrastructure planning, and food quality and safety, to mention some of them.

In addition to Jamaican law, fisheries are affected by a number of international laws and conventions, as well as bilateral and multilateral treaties or fisheries agreements. There are also international organisations which provide scientific advice and technical assistance on fisheries and fisheries management issues.

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

LEGISLATION	OBJECTIVE & SCOPE
Convention on the High Seas, 1958	- to codify the rules of international law relating to the high seas - states to draw up regulations to prevent pollution of the sea by oil from ships and pipeline or resulting from the exploration and exploitation of the sea-bed
Convention on the Prevention of Marine Pollution by dumping of Waste and other matter (LDC), 1972	- control pollution of the sea by dumping and encourage regional agreements supplementary to the convention - provide more specific categorization of substances and guidelines for the issuance of permits and maintenance of records of all pertinent maritime disposal activities - covers all seas, and all deliberate disposal of wastes other than that incidental to the normal operation of ships.
Convention on International Trade in Endangered Species (CITES)	- regulates and restricts the trade of species, or products derived from species, which have been listed by the International Union for the Conservation of Nature - Conch (*Strombus gigas*) are an important Jamaican fishery resource which is subject to regulation under CITES due to severe overfishing in many countries.

FISHERIES AGREEMENTS, BILATERALS, ETC.

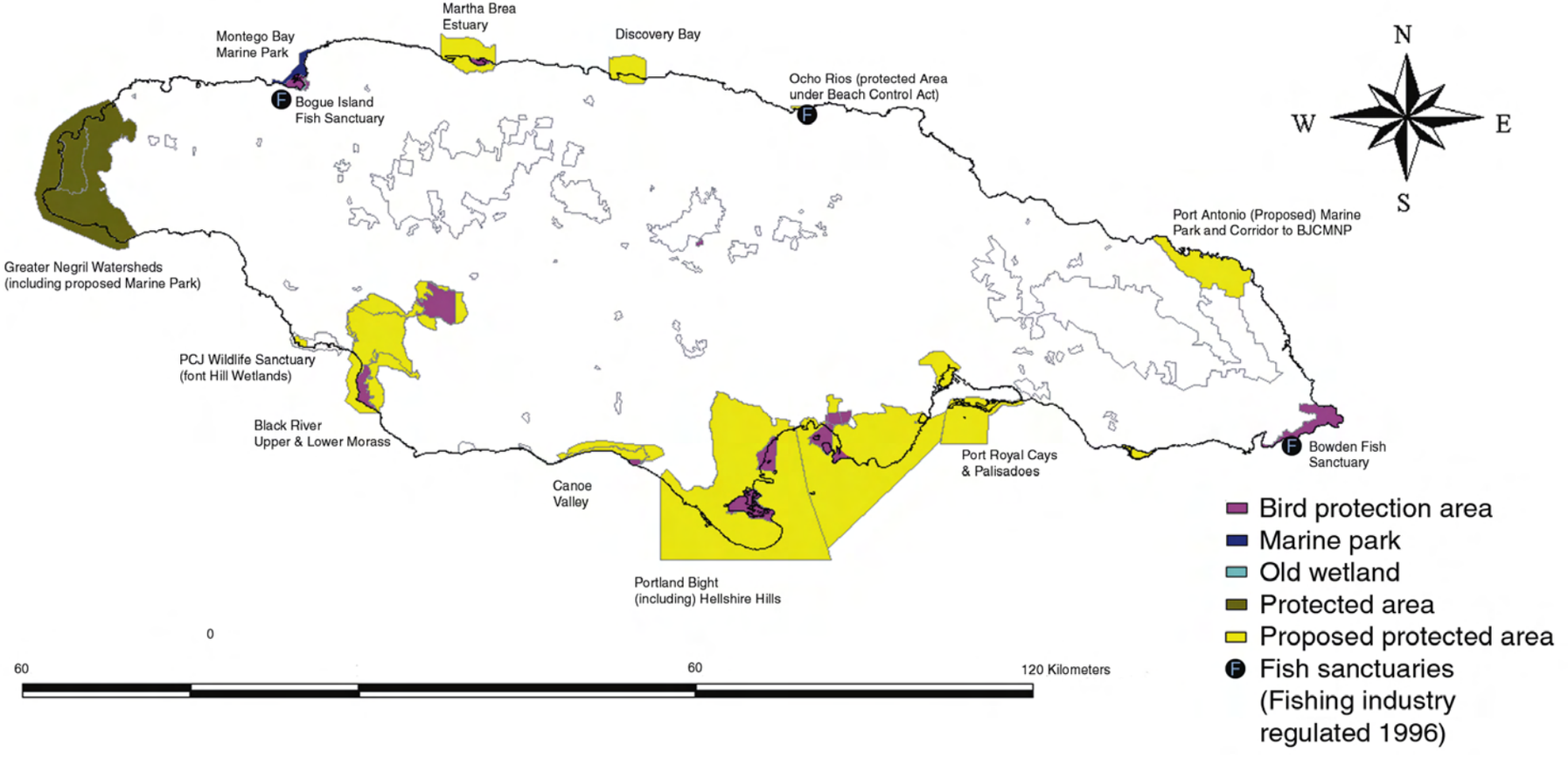
Jamaica and the Republic of Colombia, 1993	Maritime Delimitation Treaty - governs the exploitation and management of resources (incl. Fisheries) in the joint regime area, around the Cays on Serranilla Bank, Bajo Nuevo and Alice Shoal.
Jamaica and the United States of Mexico	Technical assistance in setting up lobster settlement and attraction devices
Nicaragua, Cuba, Belize, Guyana and Honduras	Bi-national fishing agreement are currently being negotiated.

LEGISLATION	OBJECTIVE & SCOPE

INTERNATIONAL ORGANISATIONS

International Committee for the Conservation of Atlantic Tunas	Provide information on the regional management of large pelagic species
Food and Agriculture Organization of the United Nation	Provides technical advice and consultation through the West Central Atlantic Fishery commission (WECAFC)
CARICOM Fisheries Resource Assessment and Management Programme	Provides technical advice and consultation within the CARICOM member states

Jamaica Protected Areas



(map courtesy of NRCA Data unit)

Protected Marine Species

All protected species are protected under the 1971 Wildlife Protection Act, enforced by the NRCA. Under this act no protected animal should be hunted, captured, killed or in any way harassed. It is illegal to have in one's possession the whole or any part of this animal, living or dead, without special permission from the NRCA.

1. TURTLES

In the Western Atlantic region, five species of sea turtle are recognized as endangered and a sixth, the loggerhead turtle, as vulnerable by the World Conservation Union (IUCN). The cause of their decline is more than 400 years of intense harvesting of sea turtles throughout the region for meat, shell, oil, and skins combined with serious degradation of nesting and foraging habitats. This has been the case in Jamaica, where the survival of turtles is perhaps more surprising than their depletion. The local and region-wide situation is further exacerbated by the fact that tens of thousands of turtles are accidentally captured and drowned in active or abandoned fishing gear every year throughout the Caribbean and Gulf of Mexico region.

Six species of turtles are protected in Jamaica

Loggerhead Head (***Caretta caretta***)

- Loggerhead nest have been reported at sometime or another from about one third of the known turtle nesting beaches, mainly on the northeast and southwest coasts.
- In the past the nested regularly on the Morant and Pedro Cays between April and July.
- Evidence suggests a decline in loggerhead population in Jamaican waters.

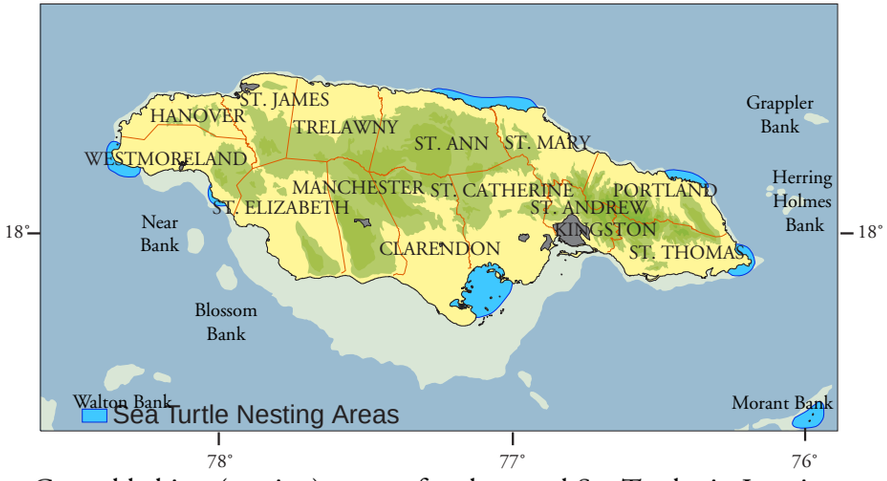
Hawksbill Turtle (***Eretmochelys imbricata***)

- Is the most common turtle in Jamaican waters, particularly in areas with coral reefs.
- Nesting occurs throughout the year, but mainly mid-June to October.
- About 12% of Jamaica's beaches have supported more than 10 females per year.

Green Turtle (***Chelonia mydas***)

- In the 1980's was the most common turtle species in Jamaica (Hill, 1855), by 1940's nests were rare (Lewis, 1940)
- Important areas are Portland Bight and Hellshire
- Nesting season June - August (Kerr, 1984)
- Female lays 2-6 clutches of eggs every 2-4 years. Clutches (125-150 eggs) are laid at 12-14 days intervals during the nesting season.

Hawksbill Turtle *(Eretmochelys imbricata)*



Coastal habitat (nesting) areas of endangered Sea Turtles in Jamaica.

Kemp's Ridley Turtle (*Lepidochelys kempii*) "malatta"

- Rarely venture in Jamaican waters

Leatherback Turtle (*Dermochelys coriacea*)

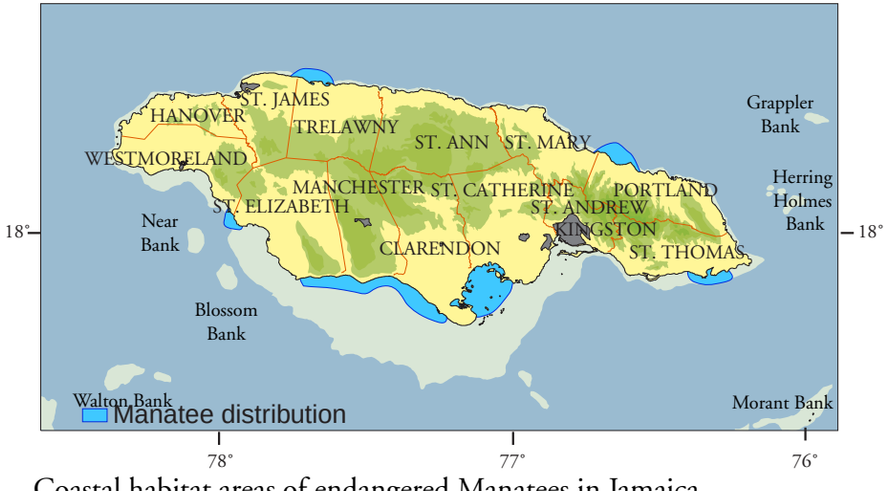
- This species is rarely reported or caught in Jamaica.

Leatherback Turtle *(Dermochelys coriacea)*

2. MANATEE

- The West Indian manatee (*Trichechus manatus*) is a plant- eating, aquatic mammal that has a tropical and subtropical distribution.
- Loss of seagrass beds, due to pollution, siltation, industrial discharges, etc.) have adverse implication for the survival of manatees.
- Jamaica's manatee population was estimated to be between 13-100.
- Most of the Manatees were found mainly on the south coast, from Portland Bight to St. Elizabeth. (1% on the North Coast).
- Found mainly at the mouths of Rivers

West Indian Manatee
(Trichechus manatus)



Coastal habitat areas of endangered Manatees in Jamaica.

3. CROCODILES

- Crocodiles are one of Jamaica's largest wild animals.
- The Jamaican species, the American Crocodile (*Crocodylus acutus*), Occurs on both the Atlantic and Pacific Coasts of northern South America, and right around the Caribbean Sea to Florida
- The American Crocodile occurs primarily on Jamaica's southern coast.
- Favoured habitats are wetlands
- Nest building, May - June in order to lay their eggs.
- The Jamaican crocodiles are **not man-eaters**, they live mainly on fish.

American Crocodile
(Crocodylus acutus)

Julio Caballeros
Sigme photo

Bruce Schwedick photo

4. SEA BIRDS

SOOTY TERNS (*Sterna fuscata fuscata*)

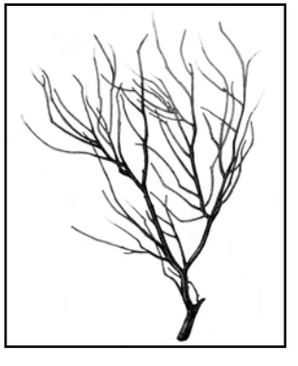
- Breeds offshore on the Morant and Pedro Cays, also in the Portland Bight Cays.
- Sooty Terns feed at the surface, snatching prey as it jumps or seizing it from the surface. They often feed in flocks. In Jamaica prey includes squid and small fish such as juvenile jacks, flying fish, young kingfish, pipefish and juveniles of other species.

BROWN NODDY (*Anous tenuirostris*)

- Occur in the same nesting colonies as Sooty Birds.
- Found mainly on Morant and Pedro Cays, also Portland Bight Cays.
- The colony on Morant SE Cay is one of the largest in the Caribbean.
- Generally less pelagic than Sooty Terns and feed closer to shore

5. CORALS

BLACK CORAL



- Black Coral is one of Jamaica's important natural resource. It is a sedentary animal which grows in a form resembling bushes or small trees on coral reefs. The dark hard skeleton may be used for making jewelery.
- Grow at depths between 70-300 feet.
- Mostly found on the north coast of Jamaica

Fisheries Profile

Overview

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 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 include the gill nets, seine nets, hook-and-line, and spearguns. There is some collection of crustaceans, molluscs and algae by SCUBA or skin divers. Larger decked vessels target lobster and conch on the offshore banks (primarily Pedro and Morant Banks; also Formigas, Henry Holmes and Grappler Banks).

In the early 1980s, large companies and investors began processing and exporting conch and lobster caught on offshore banks.

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

Landings Estimates:

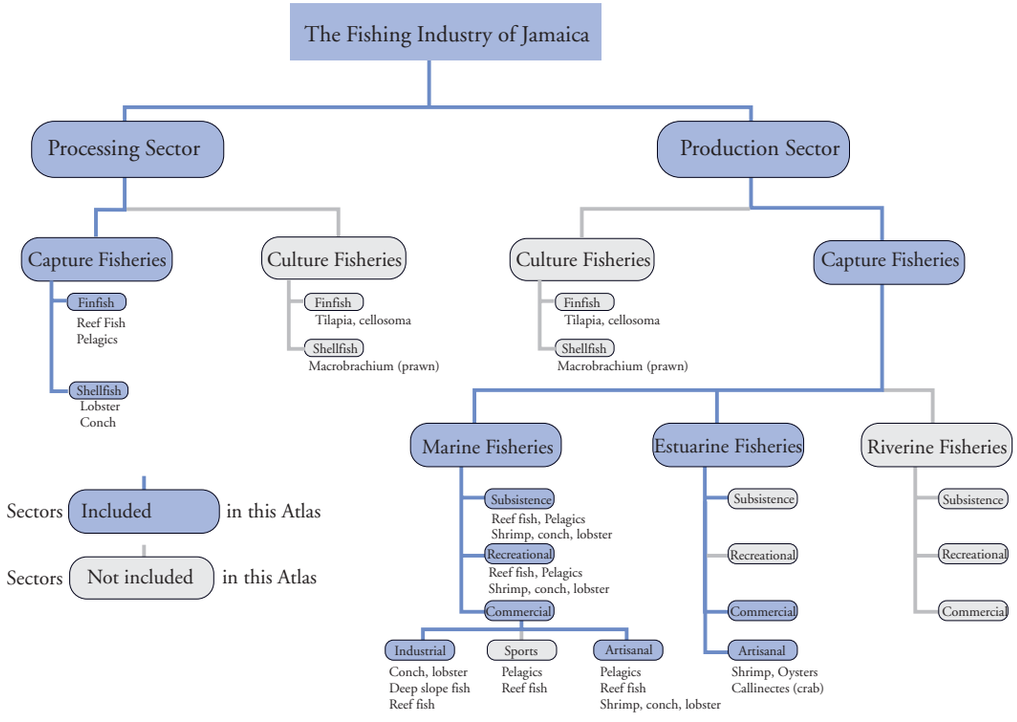
Annual catches of marine fishes from 1986 to 1995 showed a downward trend ranging from 9,100 to 4,200 MT. Since 1991 a commercial offshore fishery for conch has expanded greatly. Harvest levels in the offshore conch fishery have been maintained by diving in deeper waters using SCUBA and Hookah.

Contribution to GDP: 0.3% (1995)

Fish Imports: 21,000 MT/US$37.0 M (1995)
Fish Exports: 2,400 MT/US$18.0 M (1995)
The majority of exports are conch meats and lobster tails.
Fish processors: 12

Subsidies:
On marine fuel, boats, engines, fishing gear and other related supplies. Subsidized fuel is only available to registered fishermen.

Fishing Area: EEZ - 274,000 km²;
Shelf and proximal banks - 4,170 km²;
Oceanic banks - 7,909 km².



Fishing Fleet

There were 3,032 registered fishing vessels in Jamaica in 1997. Of them, the five vessel types listed here account for 3,019. Vessels are registered to the landing sites nearest the fishers home. In addition, there is recreational fishing such as spearfishing and there are other recreational vessels, such as yachts, which fish in Jamaican waters.

Inshore vessels fish primarily on coastal reefs and other areas. There are also about 200 of these inshore vessels which fish from the offshore cayes (e.g. Morant or Pedro Cayes) but which do not travel back and forth to the mainland with their catch. Packer boats and carrier boats transport their catches to landing sites in Jamaica.

- Canoes are traditional Jamaican canoes, constructed from logs, dug-out and then raised plank sides are added. They are up to 7 metres long, usually without an engine.
- Fibreglass vessels are larger than canoes, over 8.4 metres, but very similar in design. The obvious difference being they are constructed of fibreglass rather than wood. Most are equipped with outboard engines.

Offshore fishing is limited to the south coast where a variety of larger vessels are required to exploit the fisheries resources of the much larger shelf area and the offshore banks.

- Carrier vessels may simply carry fish purchased offshore from others, primarily inshore vessels operating from the cayes, and land it on the mainland of Jamaica. These are 'packer' boats. Others both fish for themselves and carry for others and are called 'carrier' boats. In either case, these are larger vessels (>10m) than either inshore type and are equipped with inboard or outboard engines. These vessels are limited to the reef fish fisheries.
- Plywood vessels fish for reef fish offshore. They are larger, broader and more seaworthy than the canoe-type designs of the inshore vessels and so land their own catches on the mainland. They are equipped with outboard engines.
- Steel hull vessels are limited to the industrial conch and lobster fleets. These large, inboard powered vessels carry large numbers of hoocha divers for conch or use pot-type traps for lobster. They fish the entire southern shelf area and are not limited to the vicinity of the cayes. The industrial vessels are not licensed to fish any finfish species.

Numbers of Licenses by Fishery Type

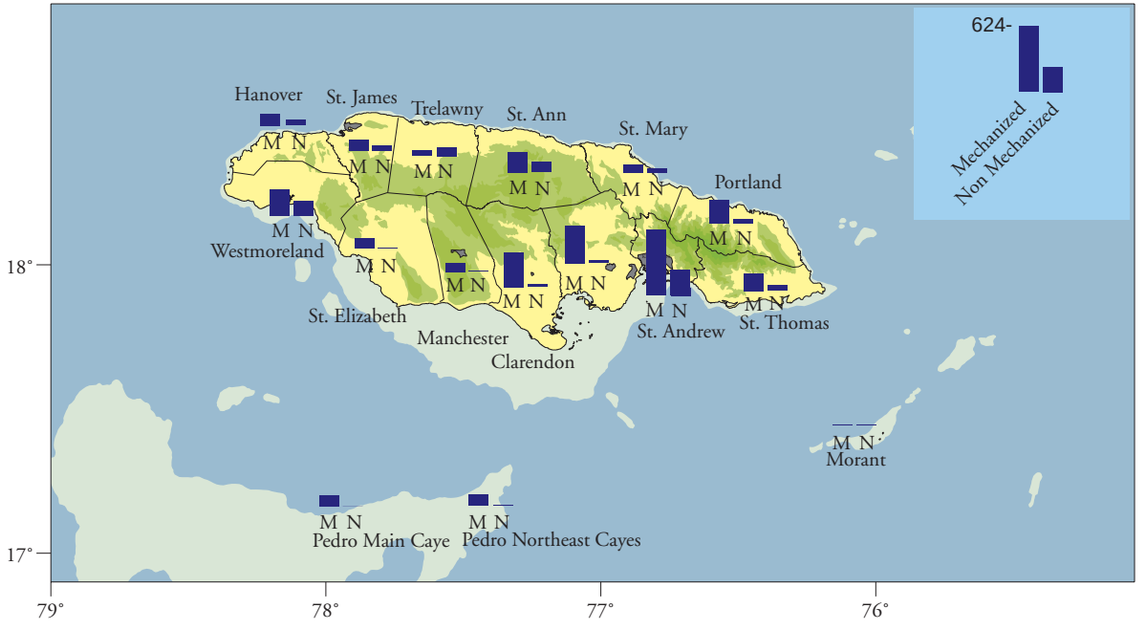
	Reef Fish	Offshore Pelagics	Coastal Pelagics	Shrimp	Lobster	Conch	TOTAL
Vessel type							
Artisanal							
Fibreglass	1674	253	112	15	109		2163
Canoe	718			82			800
Carrier	68						68
Plywood	50						50
No vessel				19			19
Industrial							
Steel hull					4	15	19
TOTAL	2510	253	112	116	113	15	3119

Gear Type	
Artisanal	
mix	2510
trolling	253
sprat net	106
beach seine	6
china net	82
otter trawl	15
hand push net	19
SCUBA	37
freelung	38
gill net	14
hoocha	20
Industrial	
Lobster (pot)	4
Conch (hoocha)	15

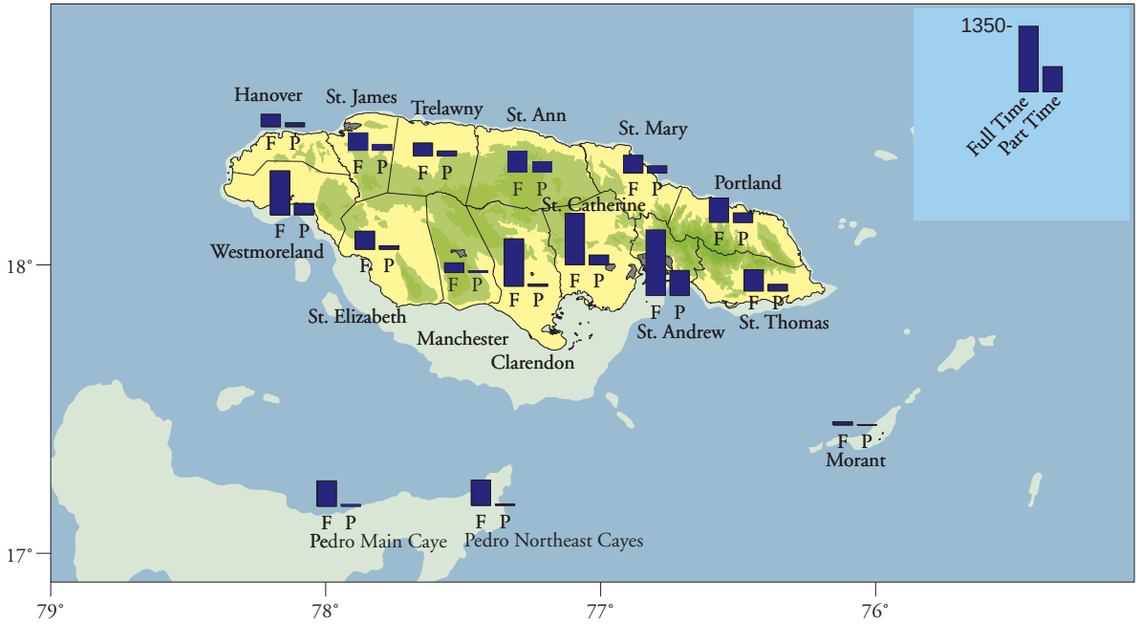
Fisheries Employment

Commercial fishers are required to register annually with the Fisheries Division. This includes owners (owner/operator), captain, crew or investor (owner but not operator). There were approximately 11,000 registered fishers in 1997 but it is estimated that up to 20,000 Jamaicans actually make some or all of their living by fishing even though they do not have fishing licenses that are currently valid. The ratio of full-time to part-time fishermen is approximately 3:1. There are approximately 1,000 fishermen permitted to fish on the Pedro and Morant Cays. Nearly 60% of fishermen are based along the South Coast.

Issues facing fishermen include fear of taxation, poor beach facilities, pollution, larceny, little or no alternative means of employment and inability to access loans to purchase equipment.



Jamaican Vessels by Parish (including Pedro and Morant Cayes)

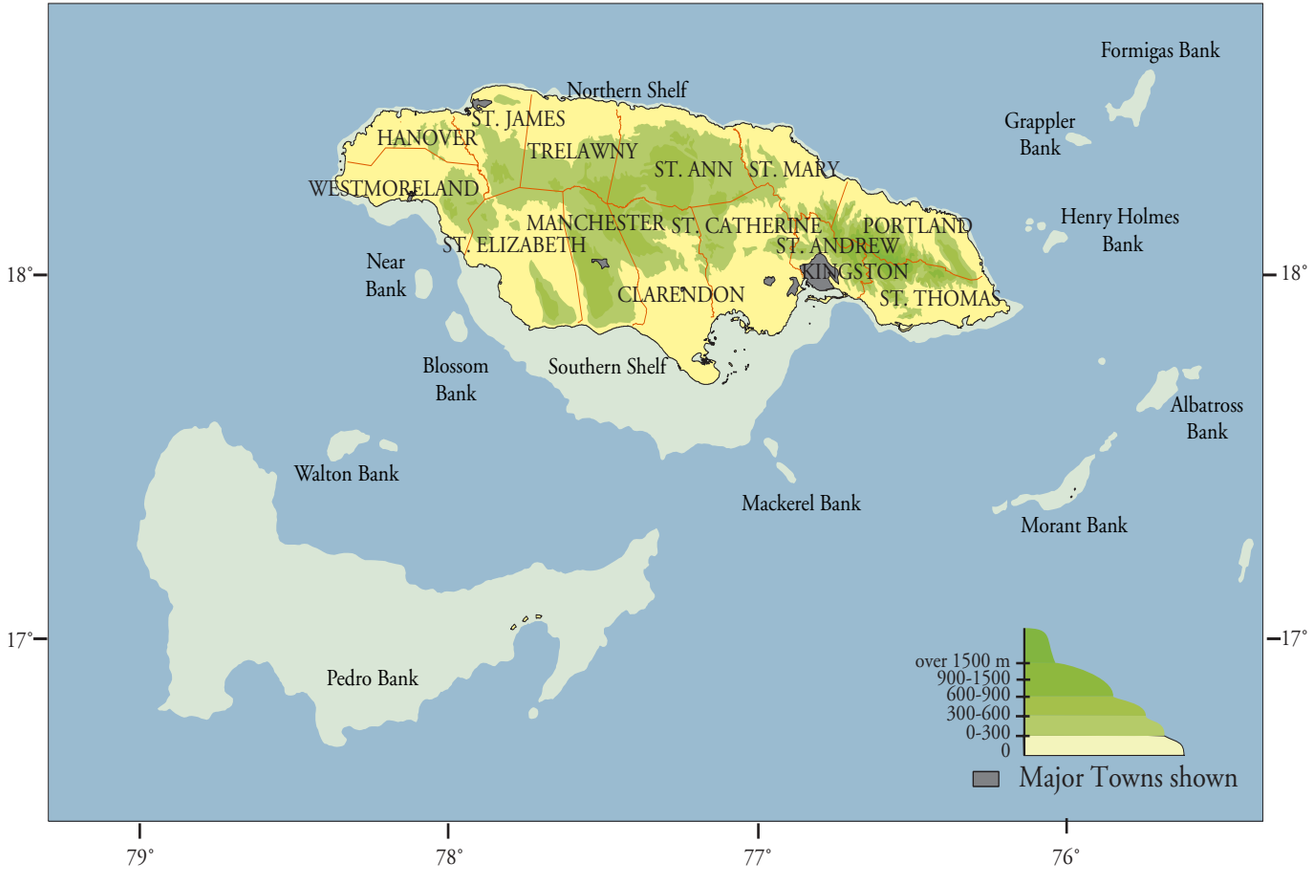


Jamaican Fishermen by Parish (including Pedro and Morant Cayes)

In addition, there are large numbers of people employed by spin-offs from the fishing industry. Examples are gear making and repair, engine repairs, boat building, fish processing workers, and fish vendors and middlemen. The employment data reported here is for direct employment in catching and landing fish by registered fishers.

Construction of Antillean 'Z' fish trap

Fishing Grounds



Major Banks of Jamaica (map data from NRCA Data unit)

The South Shelf is relatively wide (max. 24 km) with mostly small patches of corals, gorgonians and seaweeds, interspersed with sandy patches and large reefs on the eastern portion. The North Shelf is very narrow (max.1.6 km) and is characterized by fringing reefs with few gaps which are virtually contiguous with the sill reef. Well-developed sill reefs with massive corals occur along most of the edge of the South Shelf. The Morant and Pedro Banks rise abruptly from depths exceeding 500 m to form submerged plateaux with average depths from 20 to 30 m. Most fishing takes place along the edges of the banks which have the best developed reefs.

Fishing vessels and carrier boats operating on Pedro Bank, Pedro Cayes visible in background

Landing sites

The fisheries landing sites in Jamaica range from beaches with a small number of canoes through to hundreds of vessels including steel-hulled industrial ships. Key fishing beaches are located in Old Harbour Bay, Port Royal, Rocky Point and the modern fishing port complex in Kingston where carrier boats land the catch from offshore fisheries and acquire ice, water, fuel, and provisions for the offshore fishing vessels.

Discovery Bay (north coast)

Jamaican Landing Sites - 148 Fishing Beaches (+2 on the Pedro Cayes and 1 on Morant Caye)

Old Harbour Bay (south coast)

Fishing Gear Sectors

The major gear sectors of the Jamaican fishery are described in this section. For each gear sector, there is a map showing both the fishing grounds and the vessel classes using that gear in each parish.

The bar chart for each parish indicates the number of licenses for each gear type for each class of vessel. Vessels are listed by the size, the construction material, and presence of a motor. The classes are:

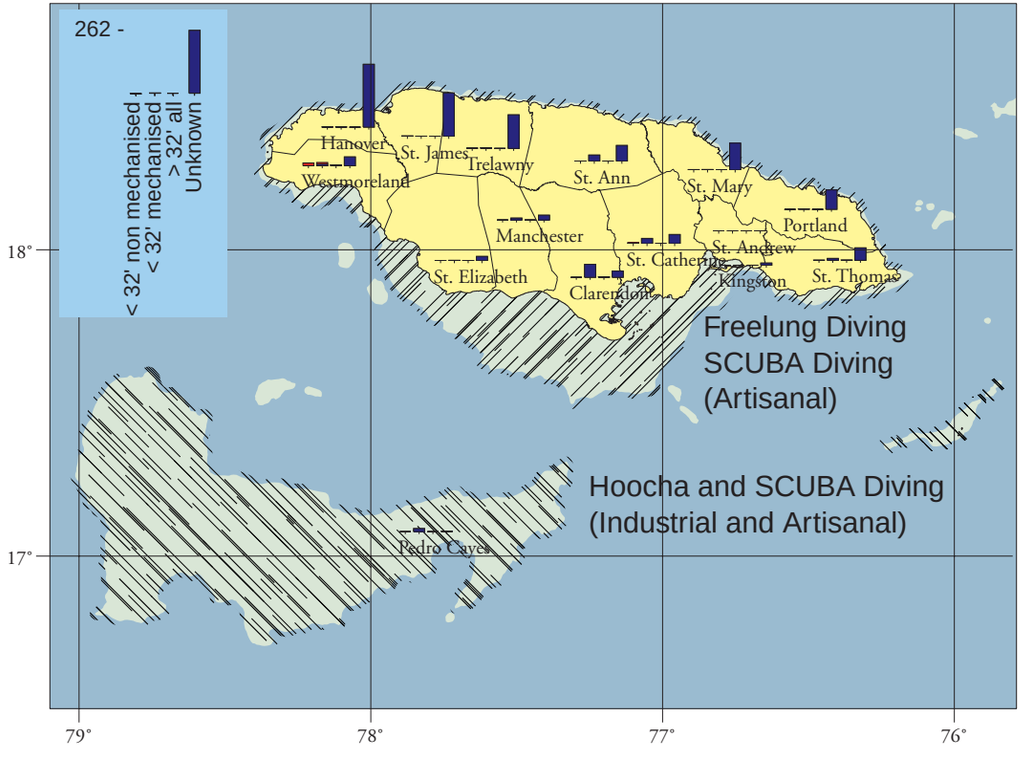
Less than 32 feet without motor,
Less than 32 feet with motor,
Greater than 32 feet with motor,
Unknown (other or unspecified).

Diving

Diving fisheries in Jamaica are conducted both 'freelung' in which the diver holds his breath, and with compressed air supply. The compressed air divers either use SCUBA tanks (Self-Contained Underwater Breathing Apparatus) or they breathe from hoocha rigs. The hoocha is a system to supply air to one or more divers through hoses from a compressor on a boat. Use of compressed air allows divers to spend 1.5 to 2 hours underwater in depths greater than 25 metres (82 ft), many times making more than 1 dive per day. Compressed air diving is dangerous and injuries and deaths occur due to the 'bends', nitrogen narcosis or air embolisms.

The conch and lobster fisheries are the major diving fisheries. In both of these fisheries the majority of divers use compressed air to permit exploitation of areas deeper than is possible for freelung divers. The divers may take their catch with their hands (conch), or a stick with a hook or wire loop (lobster).

The freelung divers mainly target finfish and lobster on the coral reef areas using hand spears or spearguns. On the north coast, where the reefs are very close to shore, freelung divers operate without boats in a small-scale artisanal or sustenance fishery.



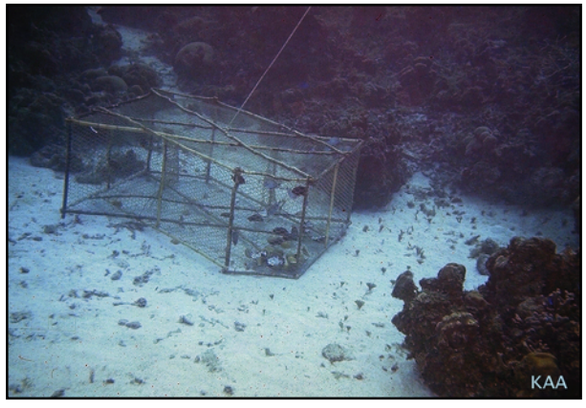
Diving Methods and Principal Fisheries	
Freelung	coral reef finfish and lobster, particularly on north coast
SCUBA	lobster and some conch on south shelf or offshore banks
Hoocha	conch and some lobster on offshore banks

Steel hulled industrial dive vessels in Kingston Harbour.

Trap or Pot

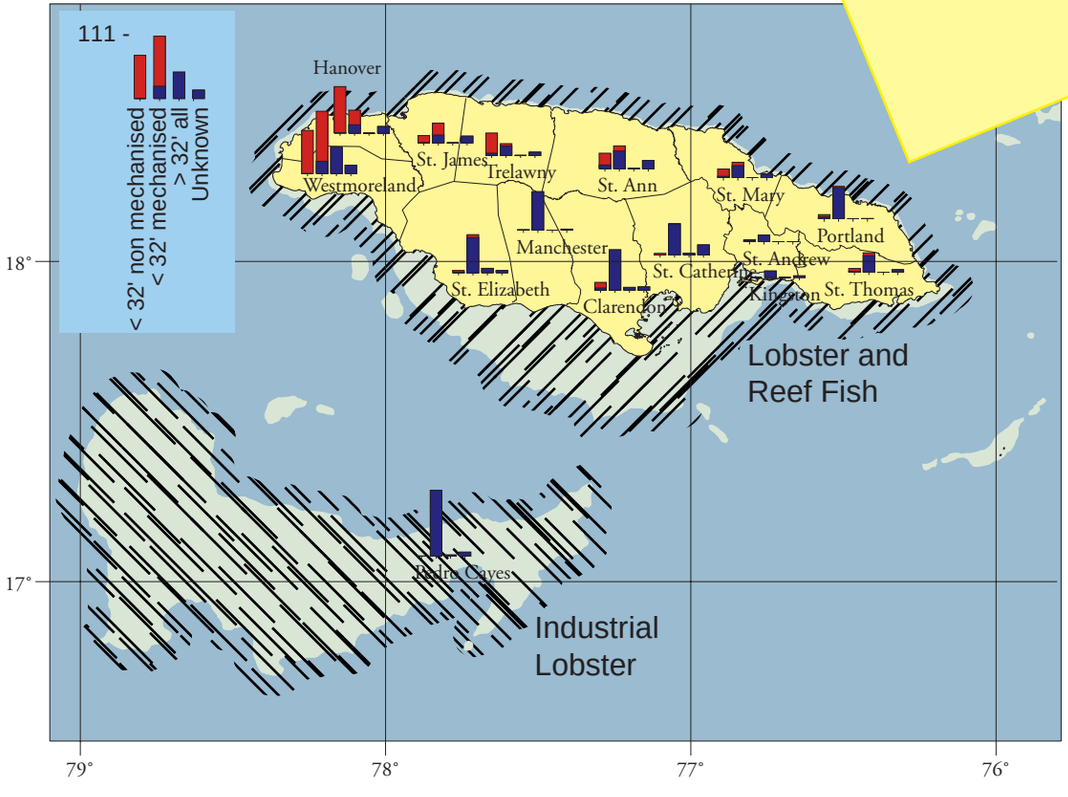
Fish traps (or pots) are used to direct for coral reef finfish and lobster. The artisanal trap is the Antillean ‘Z’ or ‘S’ trap, named for the shape of the trap outline. Both traps are built from wooden or metal frames with wire mesh (chicken wire) covering them. Two entrance funnels are shaped to allow fish and lobsters easy entrance but the tapered shape of the entrance makes escape difficult. The industrial fishery for lobster uses a slatted box trap, ‘Florida’ trap, which is specific for lobster and catches very few fish.

Trap Fishing Methods and Principal Fisheries	
Antillean traps	The 'Z' or 'S' wire trap is used for coral reef fish and lobsters on the north coast reefs and south shelf
Florida trap	The wooden slatted Florida trap is used by the industrial fishery for lobster on Pedro Bank



Antillean ‘Z’ trap at the base of the coral reef.

The red bars indicate wooden construction, while the blue bars indicate fibreglass or steel.



Antillean ‘S’ trap.

Industrial ‘Florida’ lobster trap.

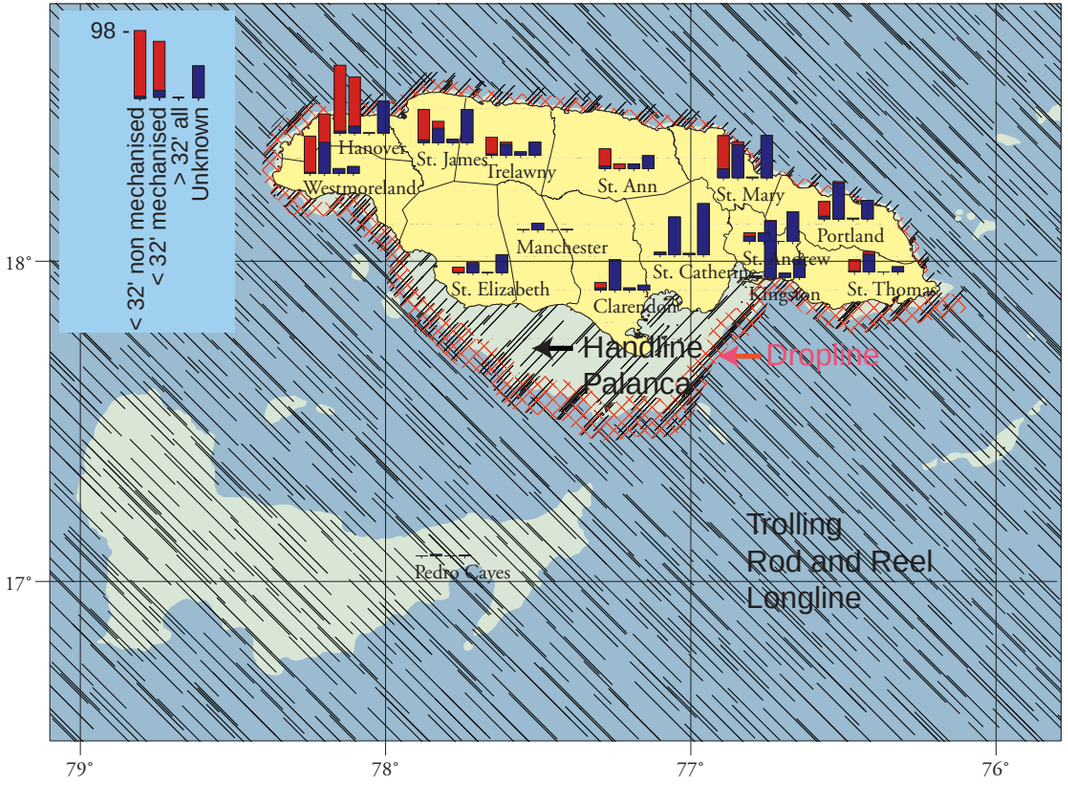
Hook and Line

Hook and line fisheries all use baited hooks to attract and capture fish. Beyond that, there is a variety of gears used to target many different types of fish. One of the most important hook and line gears is the multi-hooked longline. A longline consists of a mainline (or 'backline' or 'longline') to which many hooks are attached with shorter, lighter lines called gangings or gangions. Each gangion will have a single baited hook on it. The mainline can range from less than 100 metres to more than 10 kilometres in length, it can carry from 50 or fewer hooks up to several thousand hooks and will have floats, weights and anchors, all depending on the method of fishing being used. For use as a pelagic longline, the mainline is equipped with floats to suspend it in the midwater or often almost at the surface. A pelagic longline may be anchored to keep it in one place or it may simply be allowed to drift, depending on the target species. A palanca is a longline fitted with weights and floats so that it will fish either on or near the bottom while a dropline is a shorter longline anchored or weighted at one end and buoyed at the other so it extends vertically through the water.

Other hook and line gears use only one or a few hooks such as the handline, troll line and rod and reel. Handlines are usually fished from an anchored or drifting boat and may have one or two baited hooks attached by leaders to a weighted line. The fisher will usually pull the line to move the baited hooks up and down near the bottom to attract fish.

Troll lines are similar to handlines but they are fished from a moving boat. When multiple lines are used at the same time, poles are used to separate the lines from each other. Rod and reel is primarily used for sport fishing for large game fish like marlins or tunas, a valuable tourist attraction.

Hook and Line Fishing Methods and Principal Fisheries	
Longline	Commercial fisheries for offshore pelagics such as tunas, mackerels and dolphinfish
Palanca	Artisanal commercial fisheries for groupers, large snappers and other deep slope fish as well as some coral reef species
Dropline	Artisanal commercial fisheries for groupers, large snappers and other deep slope fish as well as some coral reef species
Handline	Artisanal commercial fisheries for groupers, large snappers and other deep slope fish as well as some coral reef species
Troll line	Both sport and commercial fisheries for offshore tunas, mackerels, dolphinfish and billfish
Rod and Reel	Sport fishing of tunas, mackerels, dolphinfish and billfish, particularly from north coast tourism areas

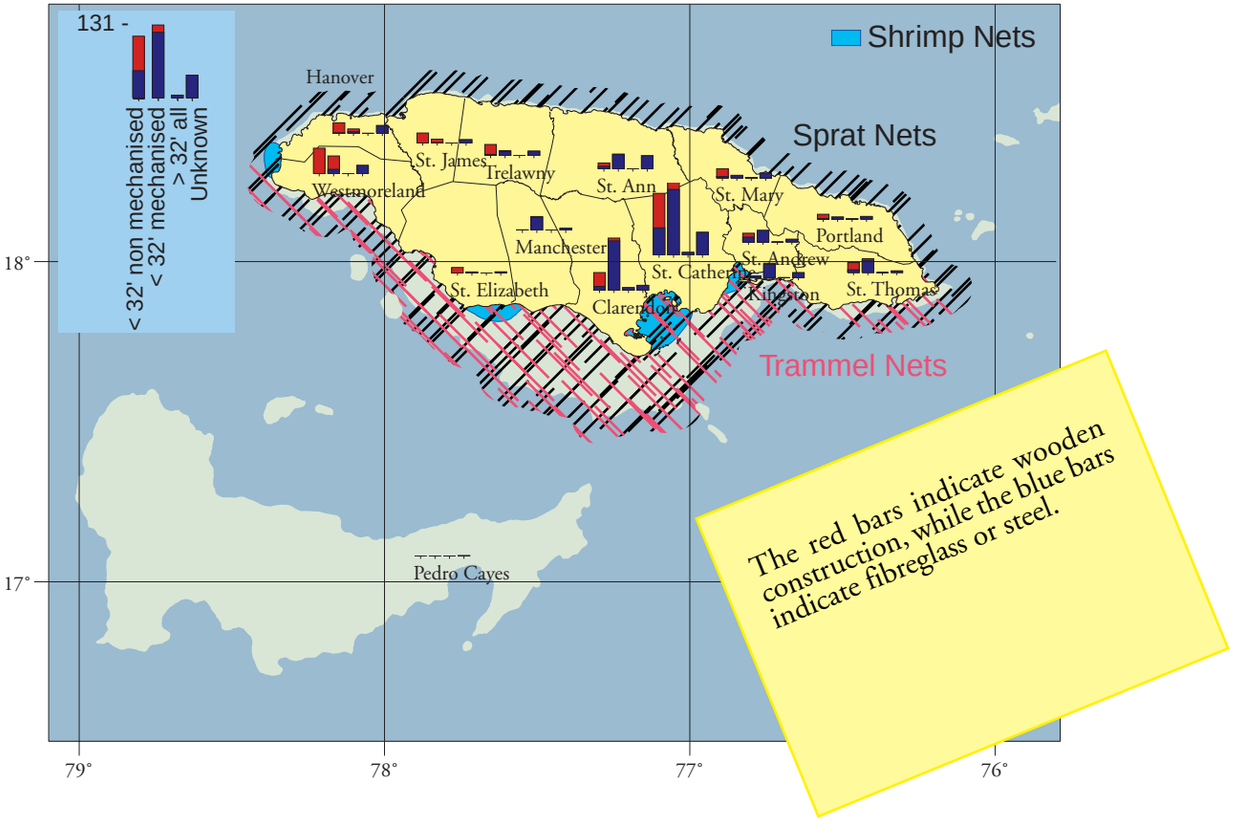


Tarpon (*Tarpon atlanticus*) is an unusual large game fish as it is caught in shallow, coastal waters.

Nets

Net fishing includes a variety of different types and uses for nets. Some nets depend on entangling the target species while others are towed or otherwise moved through the water to encounter and capture the quarry. Small-mesh netting is made from mono-filament (single-stranded) synthetic materials such as nylon while larger mesh sizes are made from multifilament (woven or twisted strands) materials such as polypropylene. The entangling nets (or gill nets) used in Jamaica include sprat nets, trammel nets and lobster nets. All of these are made with panels of netting attached between a floated topline and a weighted bottomline. The major differences are the size of the mesh openings and the depth they are fished in. The mobile nets include seines, trawls and hand nets of various kinds. Beach seines are large nets, some are more than 100 metres long, which are set in the water in an arc from a beach. The two ends are drawn in to shore, surrounding any fish between the seine and the beach and then the entire seine is pulled onto the beach to capture the fish. The beach seine is used for small coastal pelagics such as herring and jacks. A trawl is similar to a seine is some ways however, the net is shaped into a long conical bag and it is towed from a boat. Trawls use either a beam or otter boards (also called trawl doors) to spread the mouth of the trawl open allowing it to engulf the fish in its path.

Net fishing methods and principal fisheries	
Sprat net	Fine mesh, multifilament gillnet for small coastal pelagics, particularly Atlantic thread herring
China net	Similar to sprat net with larger mesh set near coral reefs for coral reef fish or in open areas targetting jacks
Trammel net	Larger mesh monofilament gillnet set near coral reefs for coral reef fish or in open areas targetting jacks
Lobster net	Similar to trammel net with larger mesh (4.5 inch) set near reefs to capture lobster
Beach seine	Long net set in semicircle from beach targetting small coastal pelagics and coral reef species (mostly juveniles)
Trawl	Towed net set from a boat used for shrimp on the south shelf
Shove net or push net	Fine mesh nets stretched between two poles and operated by one or two people who push the net through shrimp areas in shallow coastal areas



Wooden canoe with Trammel net, Sprat net on dock.

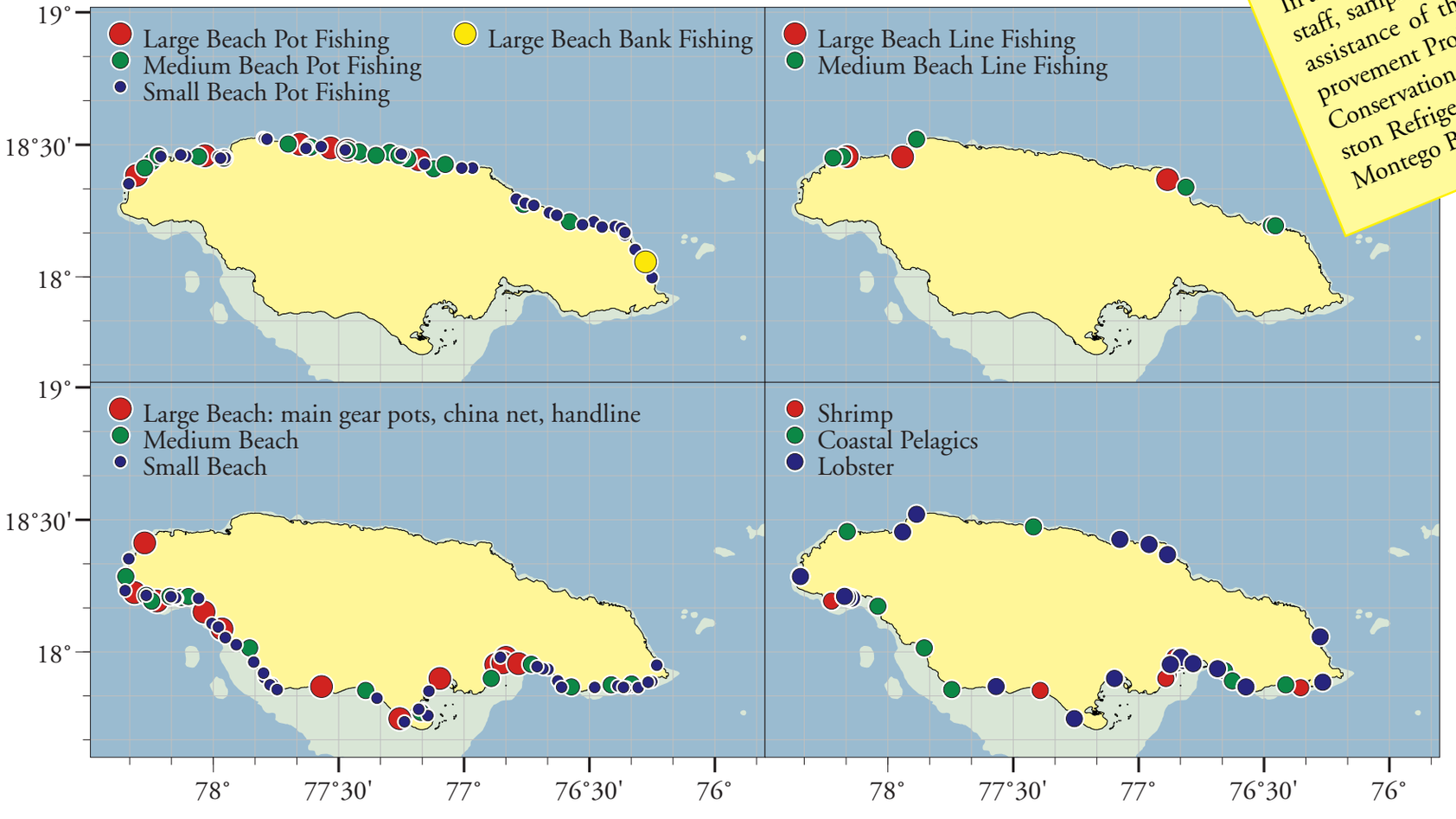
Data Collection and Sampling

Artisanal Finfish and Conch

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. 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 this month and descriptive comments on the weather and beach conditions.

Source: Jamaica Fisheries Sampling Plan (1996)

In addition to Fisheries Division staff, sampling is done with the assistance of the Fisheries Improvement Project, South Coast Conservation Foundation, Kingston Refrigeration Co. Ltd. and Montego Bay Marine Park.



Spiny Lobster measurement

Other Artisanal Fisheries
(shrimp, lobster, coastal pelagics)

Artisanal fisheries also include shellfish directed fisheries which are concentrated on the south coast. They are directed for shrimp, lobster, and to a lesser degree conch, The sampling stratum for the shrimp fishery includes only south coast beaches but that for lobster includes both the north and south coast fisheries.

The artisanal fishery for coastal pelagics is also defined by a separate sampling stratum covering both the north and south coasts. It is primarily a net fishery using gill nets or seines.

Industrial Fishery
(lobster, conch)

During 1996 the system involved issuing data log forms to industrial operators and the vessel captains. Completed log sheets are collected from the operators. The data in the log sheet included catch, effort, level of processing and fishing ground.

Source: Jamaica Fisheries Sampling Plan (1996)

Data Management and Analysis

The data gathered from the beaches are entered into a database for storage and management. Data quality checks and analyses are carried out in the database. Data analyses are also performed using spreadsheets and other computer programs.

Estimation of the total landings is made by taking the catch per day for the sampled vessels in a category and raising it up to account for the expected total number of vessels fishing. This is done for each sample stratum for each month and summed to obtain the overall total.

Once the total landings have been estimated, they are broken down by major market category. Again the data from the sampled landings, which were identified to species where possible, are used. This time it is the percent of the catch in each market category that is estimated and then applied to the totals already calculated for the sample stratum.

There are some significant limitations to the information available about the fisheries. Because both fishers and vendors are concerned about the flow of fish landed from the vessels to the vendors, the landings generally have to be estimated visually by the data collectors. Even experienced data collectors may have difficulty being accurate under these circumstances. Where the actual weights are available the data collectors will obtain these weights. Species composition is also dependent on the ability of the data collector to first identify the species by sight and then estimate what fraction of the total each species contributes.

Within each sampling stratum it is assumed that the catch rate and mixture of species caught at the sampled beaches is the same at all the other beaches. This may not be true. Furthermore, even the sampled beaches are only sampled twice per month resulting in poor precision in the resulting estimates. The Fisheries Division samples only from Monday to Friday. The analysis methods used account for the total catch on weekends but the assumption is made that fishing on weekends is similar to week days.

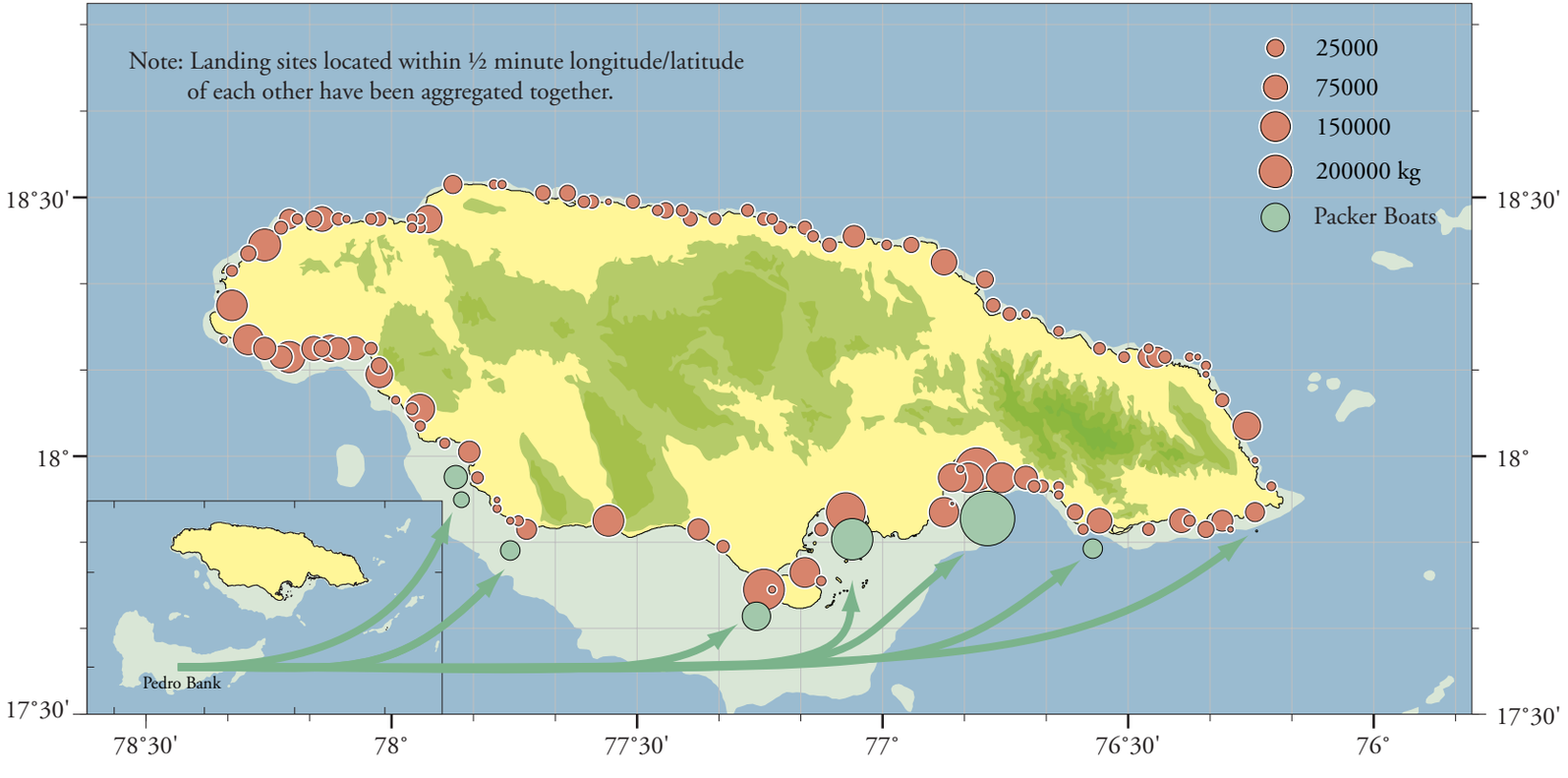
Landings

One of the primary statistics required for any fishery is the total catch. In Jamaica this is estimated for the artisanal fisheries separately from the industrial fisheries. There is a difference between *total catch* and *total landings*. The catch represents the amount of fish species actually caught during a fishing trip while the landings are that portion of the catch actually brought to shore for distribution. The difference may be discarded because of no market value, it may be sold or transferred before reaching the shore, it may be used for bait in the fishing operations or it may be consumed by the fishers during their trip.

The data collection system for the artisanal fisheries is based on landings at individual beaches estimated from samples (see Data Collection section). In addition to the direct landings at each beach, there are packer boats which carry fish, purchased at sea or on the cayes, in to landing sites on the mainland. The packer boat landings are treated separately from other landings because it is not possible to estimate the fishing effort associated with their landings.

	Landings (T)	Average Ex-vessel price (J$/lb)	Landed Ex-vessel value (US$)
Coral Reef Finfish	4476.4	80	22,719,244
Offshore Pelagics	686.7	50	2,178,272
Coastal Pelagics	428.8	30	816,114
Lobster	269.6	100	1,710,389
Shrimp	68.5	150	651,864
Conch	1805.1	130	14,887,426
Crab	9.8	10	6,217
Other (Octopus, etc.)	1.4	50	4,441
TOTAL	**7746.3**		**42,973,966**

The currency exchange rate for Jamaica dollars used in these tables is 34.75 to the U.S. dollar (1997 data).



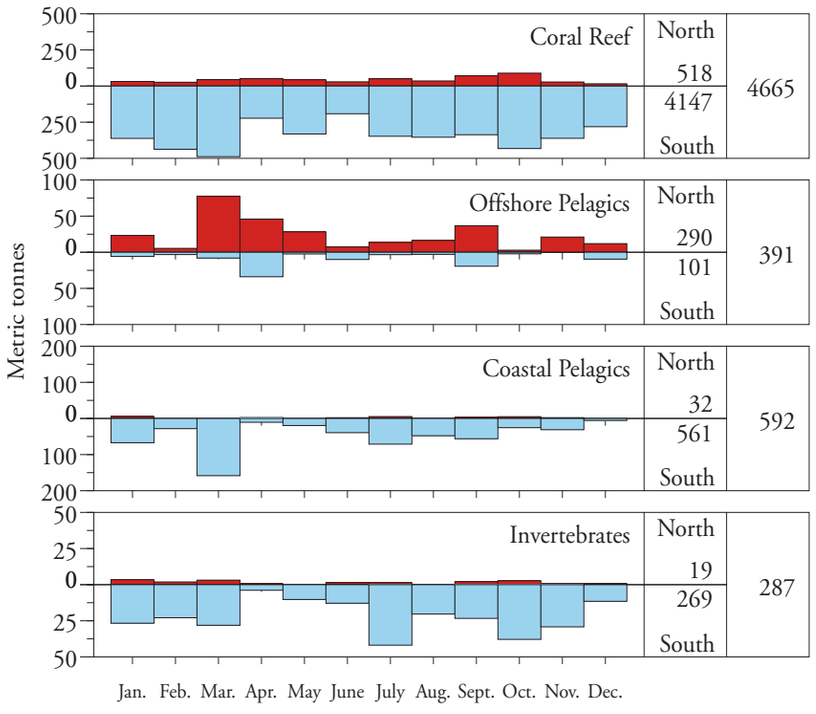
The sizes of these scaled symbols represent the estimated total artisanal landings for 1997 (in kilograms). They have been slightly aggregated to improve visibility. The packer boat landings are represented separately however the scale is the same

The total landings in 1997, artisanal and industrial combined, were 7,746 metric tonnes valued at US$ 42 million.

The south coast accounted for 88% of the total landings, including the contributions from the offshore banks (e.g. Pedro Bank). The south shelf is much larger (292,000 ha) while the total shelf area on the north coast is only 50,000 ha.

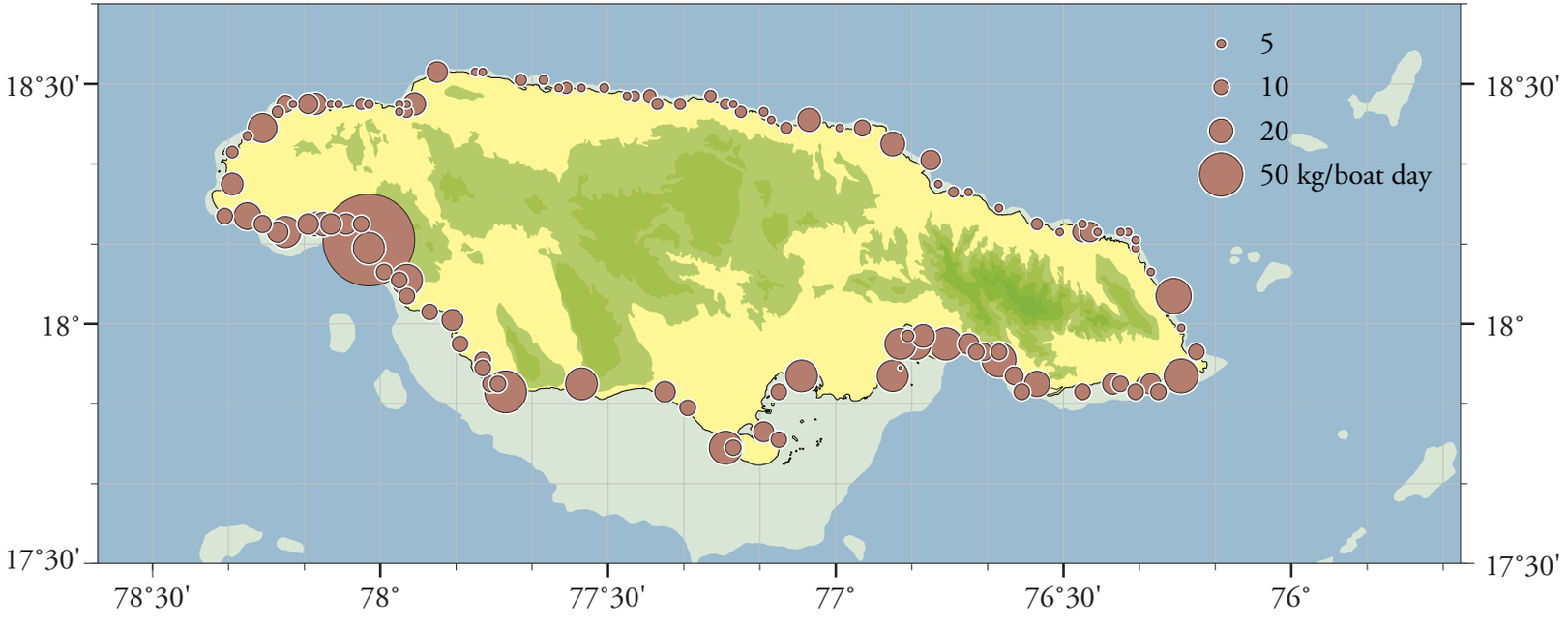
As well as the total amount caught, the types of fish caught differ substantially between the north and south coast. The artisanal landings on the south coast are dominated by the coral reef species (82%) followed by coastal pelagics (11%). The north coast landings are also dominated by coral reef species (60%) but to a much smaller degree. The offshore pelagics make up a full third (34%) of the north coast landings while they are less than 2% on the south coast.

Monthly landings by Artisanal fisheries in 1997.



The seasonal pattern in the fisheries is strongest for the offshore pelagics, reflective of the migratory nature of many of those species.

The industrial fishery accounts for another 108 tonnes of lobster and 1678 tonnes of conch landed on the south coast.



Catch rate, or catch per unit effort, is one measure of the health of the fish stocks. When fishermen have to work harder to catch the same quantities of fish, it means that the fish are less abundant and it also means that the fishers are less successful economically. The 1997 artisanal catch rates, of all species combined (kg/boat day) are shown for aggregated landing sites. The relative scarcity of fish on the north coast is easily seen.

Coral Reef Fish

The coral reef finfish account for the largest catch category in Jamaica fisheries. This group is made up of a large number of species from many different families of fish. Because of this diversity, there are many different patterns of life history and biology represented within the group. The most general pattern starts with planktonic eggs released into the water. As the eggs develop and hatch the larvae are carried wherever the currents go. Eventually they develop to the stage when they are ready to settle out of the plankton and begin living on or near the bottom as juveniles. For many species the juveniles live in associated habitat, such as mangrove stands or seagrass, rather than on the coral reefs themselves. Only as they grow and mature do they take up life on the reefs.

MANAGEMENT STATUS:
Over-exploited

MANAGEMENT GOAL:
Biological sustainable use of the fishery resources for the social (employment) benefits to the individuals who exploit the resources of the Island shelf (north and south shelf including beaches and estuarines), Offshore banks (Pedro, Morant, other offshore banks) and the Joint Regime Area (Alice Shoal, Bajo Nuevo and Serranilla).

MANAGEMENT ACTIONS:

1. **Conservation Measures** will be developed with a goal of rehabilitating reef fisheries to sustainable levels. The most direct approach will be to control fishing effort. This will mean controlling and eventually reducing the numbers of boats and fishers in the coral reef fisheries. Encouraging fishers to increase the mesh size used in their fish pots will also contribute to improving production from coral reefs. These fisheries are dependent on the quality and amount of coral reef habitat available. Artificial reefs offer some means of enhancing fish production in areas where natural reefs don't exist or have been degraded. In spite of this, protecting or enhancing the natural habitat is one of the most important measures for protecting the coral reef fisheries. Creation of marine reserves will protect both the habitat and the fish within them but this must be paralleled by protection of the remaining marine areas from fisheries over-exploitation, land-based effects, such as sewage, agricultural run-offs and siltation, and outright destruction such as mangrove clearing, dredging and blasting of reefs, and sand mining.
2. **Integrated Coastal Zone Management Measures** will include the measures to protect these fisheries into the planning for all coastal zone activities. By ensuring that the NRCA and related NGO's include healthy coral reefs and coral reef fisheries in their requirements, we will ensure that any planned coastal development or inland activities, that could directly or indirectly affect the reef ecosystem, will adopt measures to protect the reef ecosystem. Instituting pollution abatement measures for existing developments and activities through the NRCA and integrated rural development will help alleviate land-based activities which affect the fishery.
3. **Monitoring and control** of fisheries activities by the Fisheries Division will ensure that, based on the status of the stock, management options are put in place to ensure the fishery is sustainable. In addition to the conventional role of resource managers, the Fisheries Division will be working with fishers and fishers organisations to establish co-management arrangements to meet the conservation goals for this fishery.

Over-exploitation has reduced catches to very low levels in some areas. Most of the fish are juveniles, better left to grow before harvesting them. The lobsters are worth much more than the fish.

Marketing and Distribution

The coral reef finfish landings are divided into three market categories based on value and three other groups based on taxonomic family. The complete list of all species identified with each market category is included in Appendix 1. The highlighted market categories are described in more detail on the following pages.

Market category: **Quality** fish are the most valuable of the three categories of mixed reef fish.

Wholesale - J$80/lb
Retail - J$100/lb

Market category: **Common** fish are intermediate in value

Wholesale - J$60/lb
Retail - J$80/lb

Market category: **Trash** are the lowest priced species of mixed reef fish

Wholesale - J$50/lb
Retail - J$60/lb

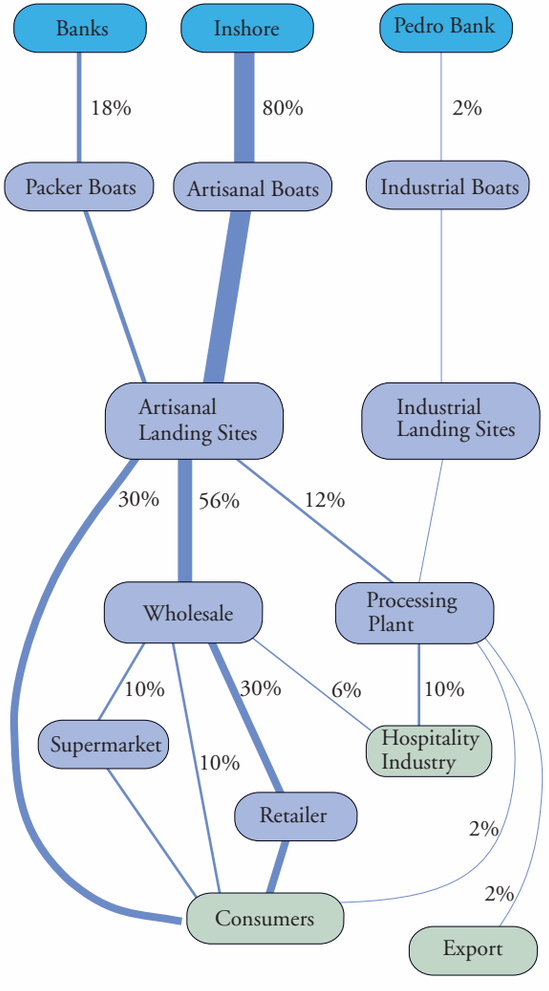
Some species, having higher prices than any of the three mixed species categories, are separated and marketed individually. The **Snappers** are the only one of these for which there is any significant total catch.

The Groupers and Barracudas are both very vulnerable to overfishing and were amongst the first species to be depleted by excessive fishing pressure.

A large fraction (30%) of the artisanal landings is purchased by consumers directly from fishers at their landing sites. Overall though, more than half of the artisanal landings are distributed via wholesalers to the supermarkets and other retail marketers.

Fish for sale at the landing site accounts for an important part of the coral reef finfish catch, particularly for the lower valued types.

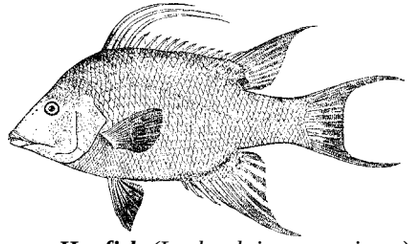
Distribution of Reef Fish
From Fishing Grounds to Consumer



The coral reef fisheries are dominated by artisanal fishing on the island shelf areas. The vast majority (98%) of the catch remains in Jamaica for either local or tourist consumption.

Quality Reef Fish

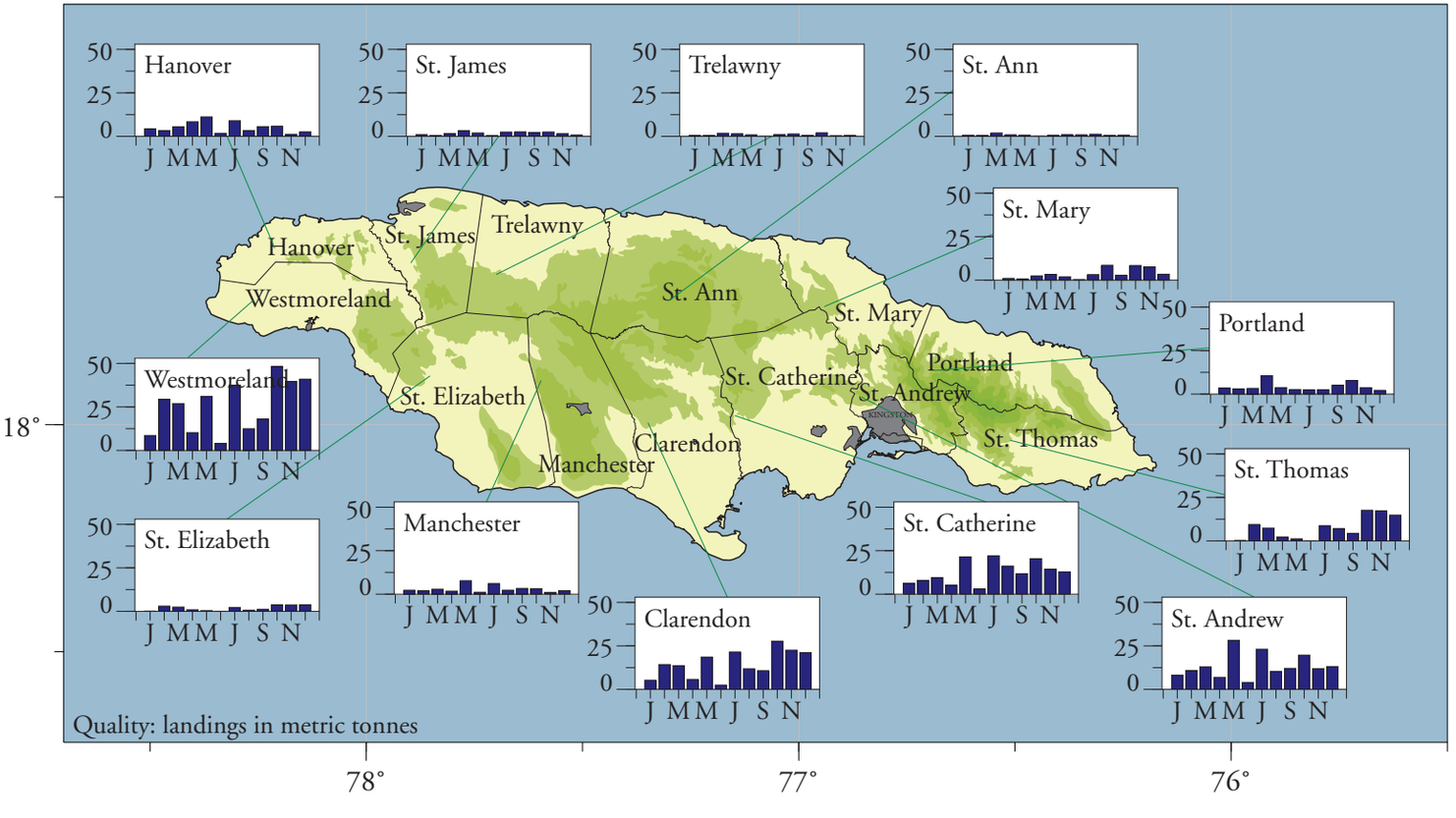
The quality market category includes a number of smaller groupers, large parrotfish, goatfish, mullets, and wrasses. A complete species list is included in Appendix 1.



Hogfish *(Lachnolaimus maximus)*

Hogfish (*Lachnolaimus maximus*)

Quality reef fish including goatfish and parrotfish



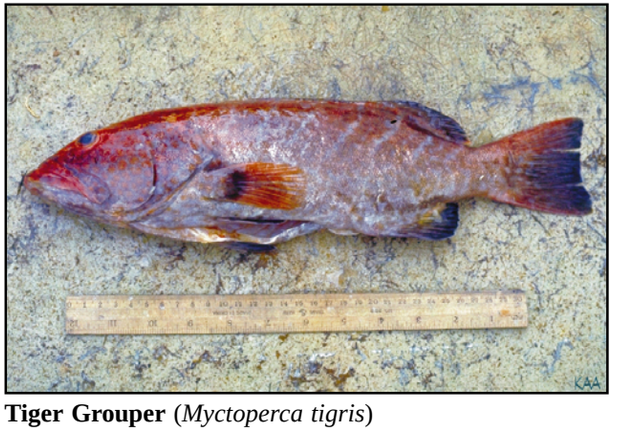
Landings (metric tonnes) of quality reef finfish in 1997, excluding the landings by the packer boats from the offshore cayes and banks.

Stoplight Parrotfish (*Sparisoma viride*)

The Stoplight parrotfish, like all parrotfish, shows a dramatic sexual dichromism, meaning that the two sexes have different colour schemes. While this happens in many animals, birds and fishes, it's a bit more complicated in the parrotfish. Only the dominant males (upper) develop the characteristic male colouration called 'supermale'. The subordinate males are indistinguishable from the females (lower).

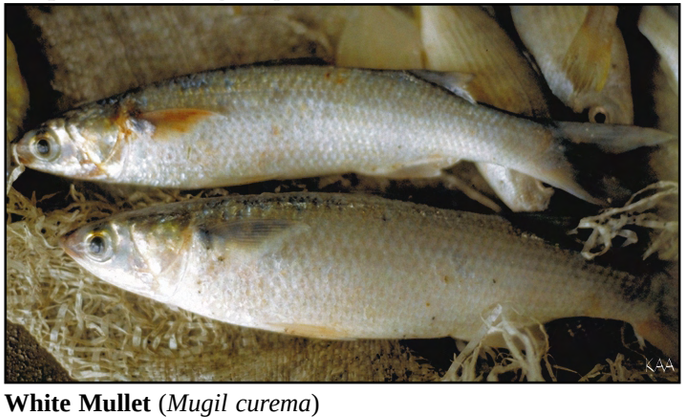
Southern Sennet "snit" (*Sphraena picudilla*)

This Tiger grouper looks thin because it has already been gutted for market



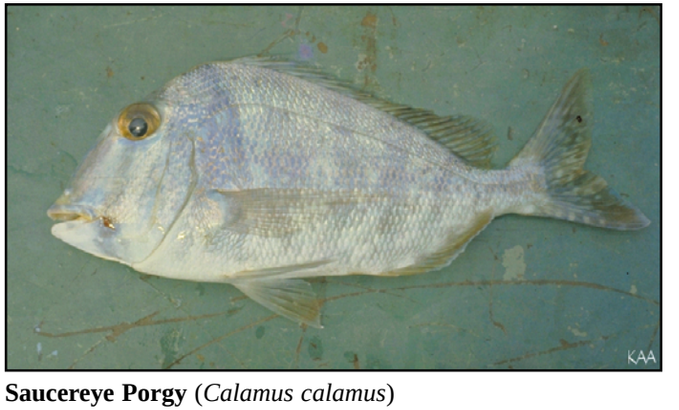
Tiger Grouper (*Myctoperca tigris*)

Striped Mullet (*Mugil cephalus*)



White Mullet (*Mugil curema*)

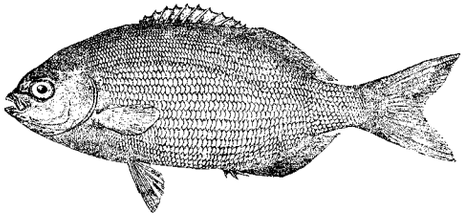
Yellowfin Grouper (*Myctoperca venenosa*)



Saucereye Porgy (*Calamus calamus*)

Common Reef Fish

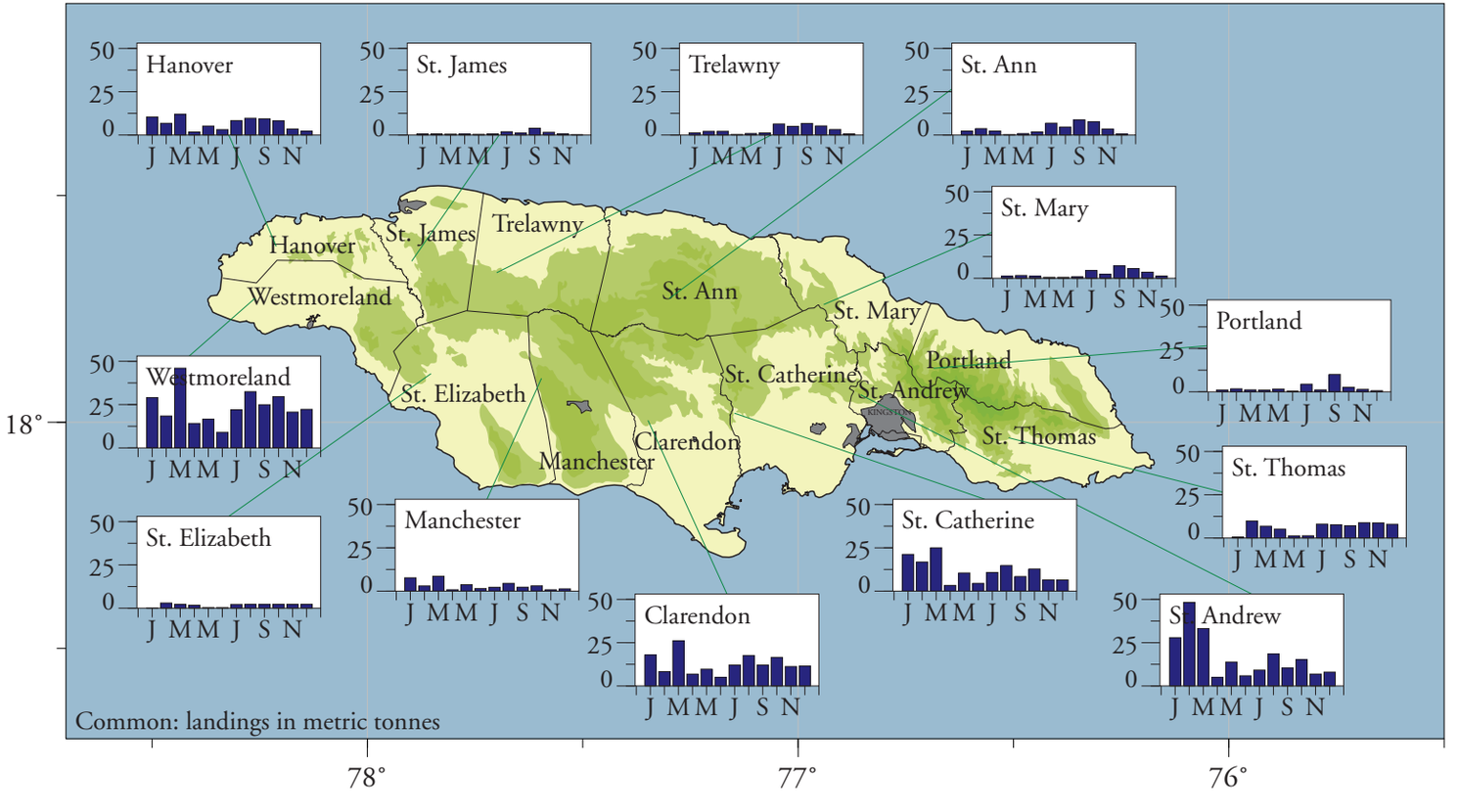
The common market category includes a number of species of grunts, snooks, chub and some smaller wrass and parrotfish species. A complete species list is included in Appendix 1.



Bermuda Chub *(Kyphosus sectatrix)*

Baskets of catch sorted into Quality (left) with Red hind, Stoplight parrotfish and Yellowtail snapper and Common (right) with French and Caesar grunts and some Squirrelfish from the trash category.

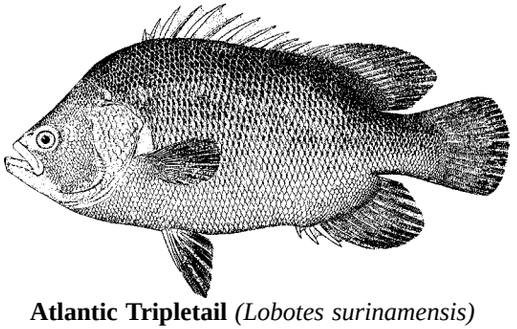
Quality **Common**



Landings (metric tonnes) of common reef finfish in 1997, excluding the landings by the packer boats from the offshore cayes and banks.

Tripletail or **Atlantic Tripletail** *(Lobotes surinamensis)*

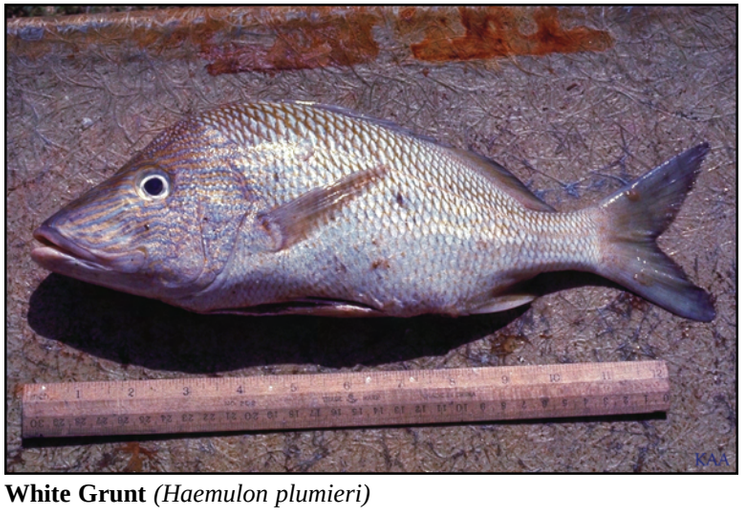
An uncommon 'common' species, the Atlantic tripletail rarely appears in the catch. A sluggish fish, the tripletail often floats on its side near the surface.



Atlantic Tripletail *(Lobotes surinamensis)*

Bluestriped Grunt *(Haemulon sciurus)*

Black Grunt *(Haemulon bonariense)*



White Grunt *(Haemulon plumieri)*

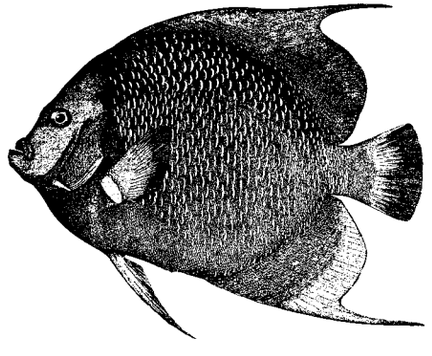
Trash Reef Fish

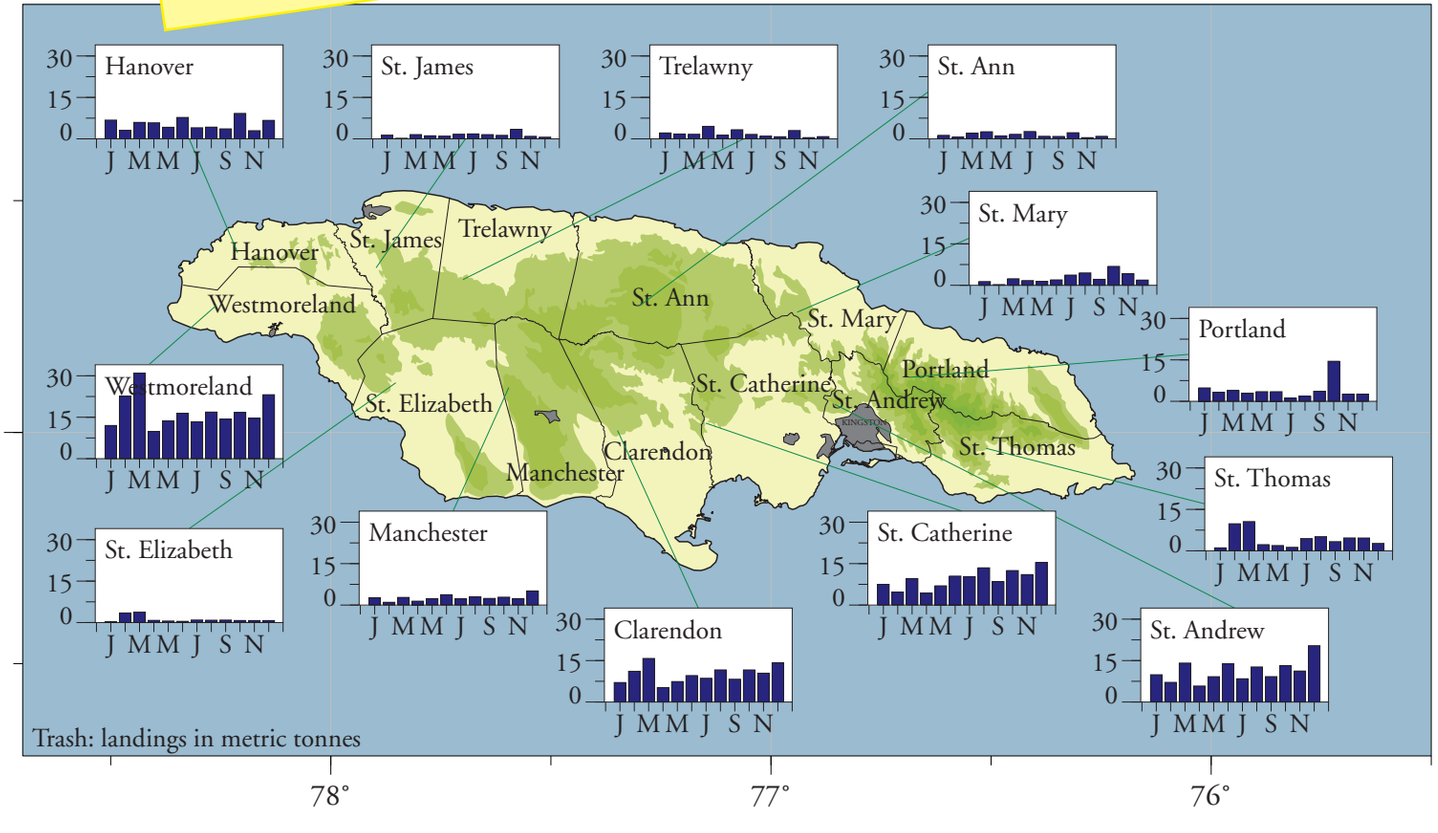
Trash reef fish refers to the lowest price class of reef fish and, unlike many fisheries in other countries, does not imply that they are discarded. Many of the trash species are small bodied or oddly shaped with little meat and so are in little demand with consumers. Also included in the trash category are undersized or juvenile individuals of more highly valued species. The trash species are a very diverse category which includes many of the highly visible and colourful reef fish of interest to divers and other tourists.

The 'trash' fish are not really trash at all, just the least expensive types of reef fish.

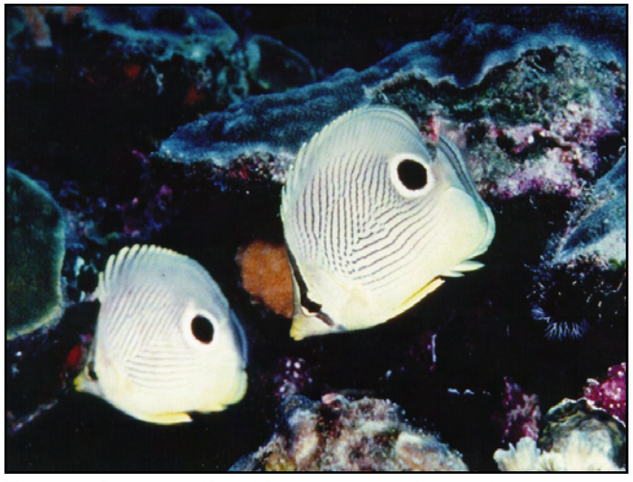
A selection of Trash mixed reef fish for sale. Included are Rock Beauty, Ocean surgeon, Gray triggerfish, Black durgon, Moray eels, small grunts and others.

French Angelfish *(Pomacanthus paru)*

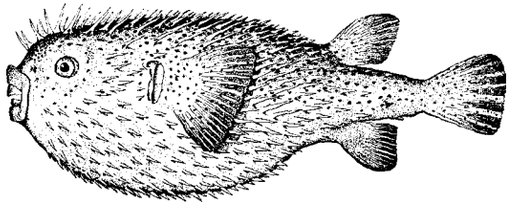




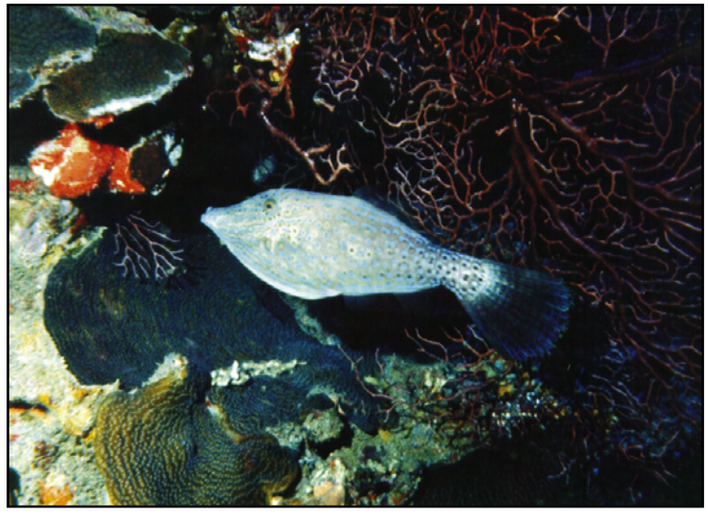
Landings (metric tonnes) of quality reef finfish in 1997, excluding the landings by the packer boats from the offshore cayes and banks.



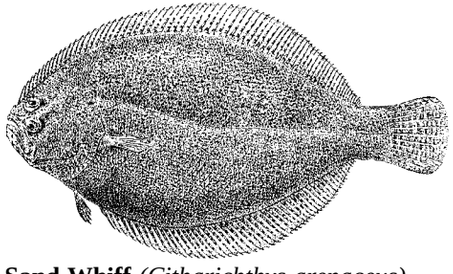
Foureye Butterflyfish *(Chaetodon capistratus)*



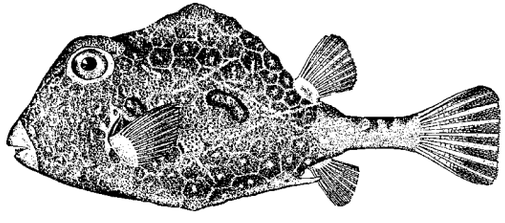
Porcupinefish *(Diodon hystrix)*



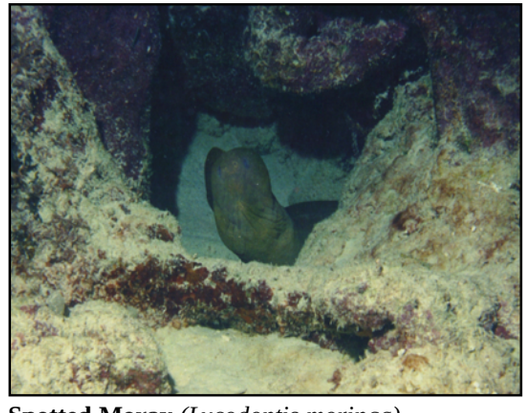
Scrawled Filefish *(Aluterus scriptus)*



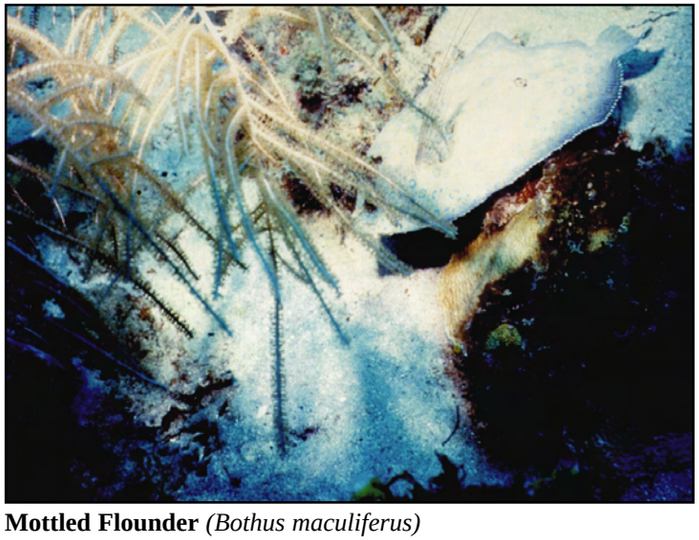
Sand Whiff *(Citharichthys arenaceus)*



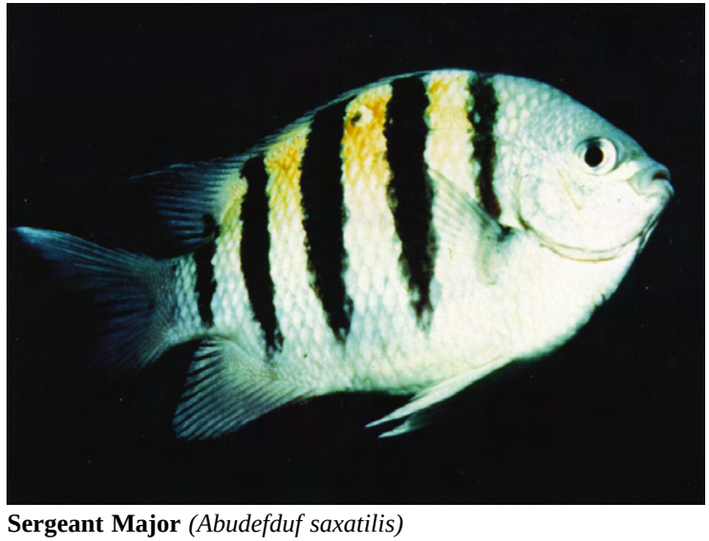
Buffalo Trunkfish *(Lactophrys trigonus)*



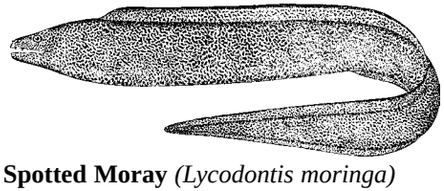
Spotted Moray *(Lycodontis moringa)*
(formerly *Gymnothorax moringa*)



Mottled Flounder *(Bothus maculiferus)*



Sergeant Major *(Abudefduf saxatilis)*

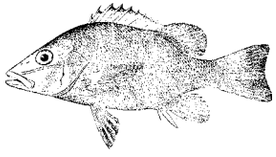


Spotted Moray *(Lycodontis moringa)*
(formerly *Gymnothorax moringa*)

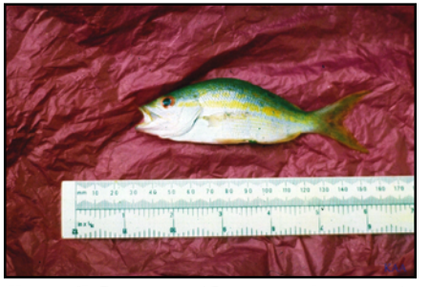
Snapper

Snappers are all members of a large family of mostly reef dwelling fish (*Lutjanidae*). Snappers are valued as food fish because of their relatively large size, robust body and high quality flesh. Many species spend parts of their lives, usually as juveniles, in shallow coastal areas such as mangroves and turtle grass beds. They are all carnivorous, predators on small reef fish and invertebrates and are most active at night. While some species are known to grow 60 to 90 cm in length and over 10 kg in weight, such large individuals are never seen in heavily fished populations. The larger snappers are now found in much deeper waters, below the reef depths and on the deep slope and bank edges.

Grey Snapper *(Lutjanus griseus)*

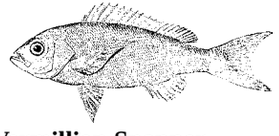


Schoolmaster *(Lutjanus apodus)*



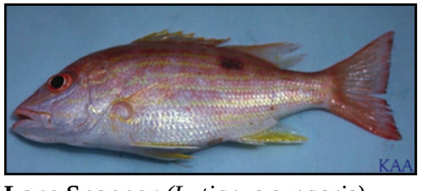
Yellowtail Snapper *(Ocyurus chrysurus)*

Grey Snapper *(Lutjanus griseus)*

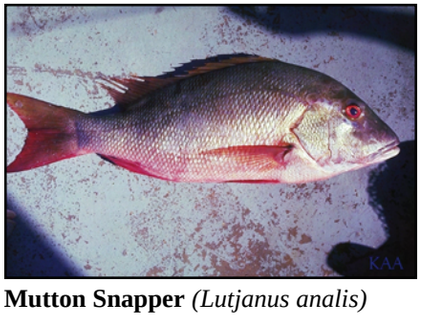


Vermillion Snapper *(Rhomboplites aurorubens)*

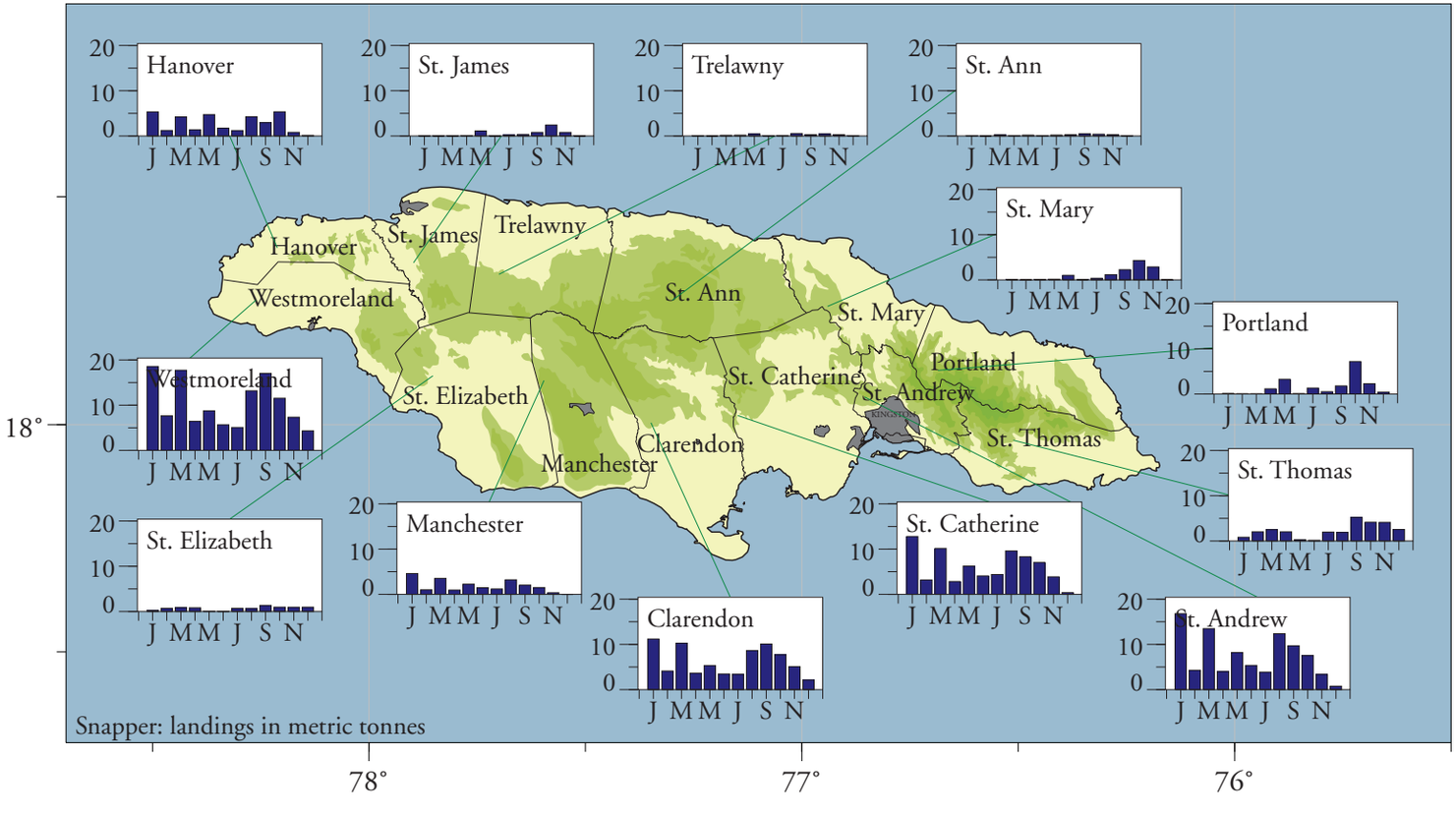
Lane Snapper *(Lutjanus synagris)*



Lane Snapper *(Lutjanus synagris)*



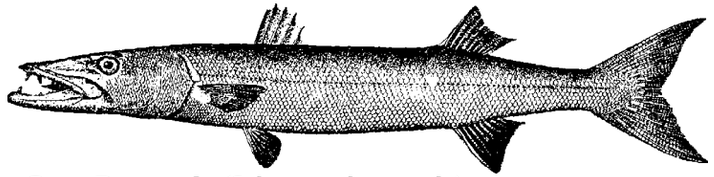
Mutton Snapper *(Lutjanus analis)*



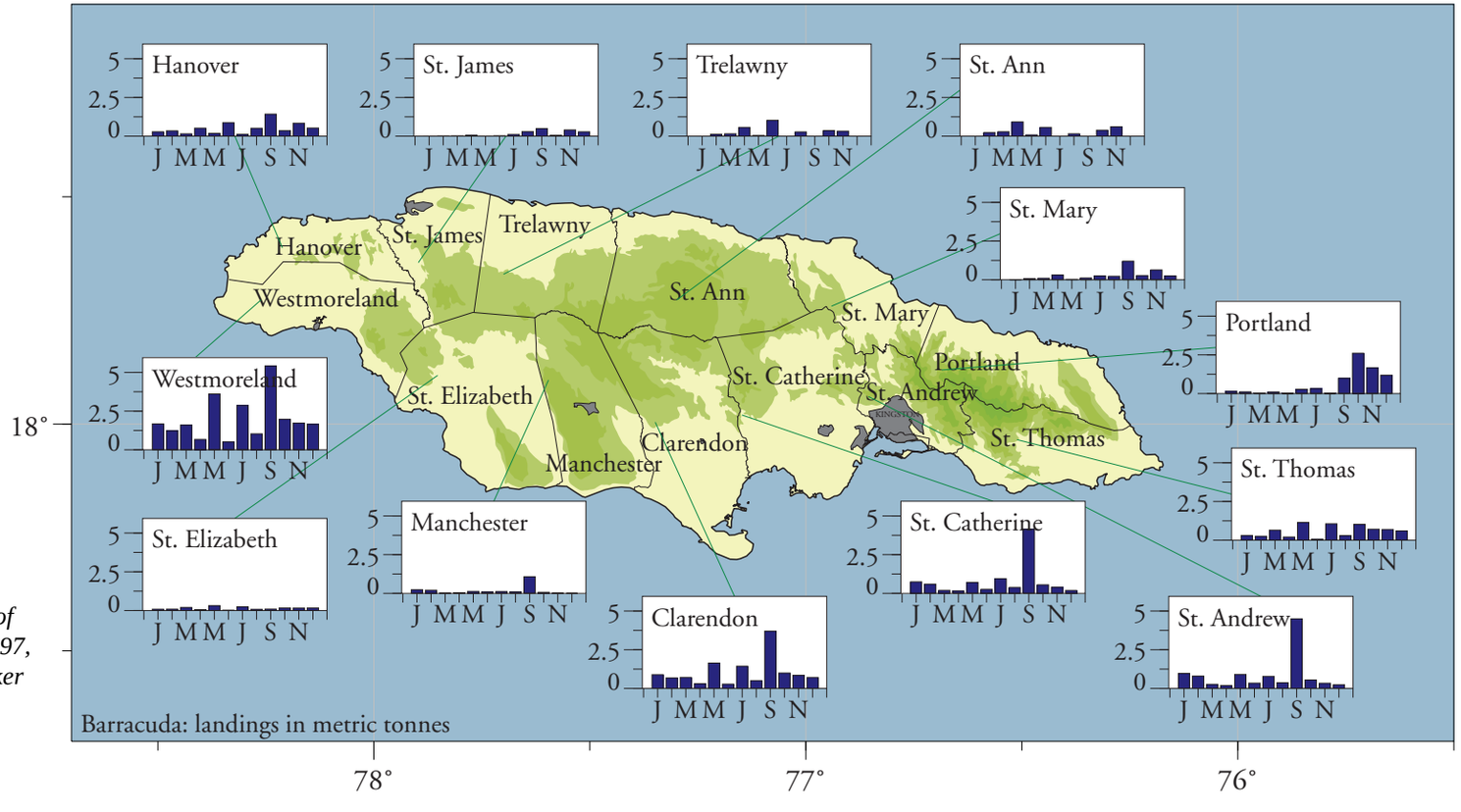
Landings (metric tonnes) of Snappers in 1997, excluding the landings by the packer boats from the offshore cayes and banks.

Barracuda

The great barracuda is a large reef predator, feeding on many species of reef fish. Frequently growing in excess of 1 meter (39 in.) long and reported to lengths up to 2 meters. In spite of their menacing appearance there are few incidents of barracuda attacking people. However, because of its' place at the top of the food chain, the barracuda can carry dangerous concentrations of ciguatera toxin. Eating ciguatoxic fish can cause illness, paralysis and even death.



Great Barracuda *(Sphyraena barracuda)*



Monthly landings (metric tonnes) of barracuda in the reef fishery in 1997, excluding the landings by the packer boats from the offshore cayes and banks.

Deep Slope and Bank Fish

MANAGEMENT STATUS:
Unknown, some species may be over-exploited or severely depleted.

MANAGEMENT GOAL:
Determine the status of the fish stock (stock assessments) and control any further development of this fishery.

MANAGEMENT ACTIONS:

1. **Conservation Measures** are in place to protect seasonal spawning aggregations and nursery areas where these species spend their early life stages.
2. **Social and Economic Measures** are intended to increase, if possible, grouper catches to meet the needs of domestic and export markets.

Large Groupers

The large groupers are only found on the deep slope now, although they were histoically part of the coral reef fisheries. The large groupers have become very rare in the coral reef catches because of fishing pressure. Their large size and high quality meat make them highly prized (and highly priced) but they are relatively slow-growing and are among the first species to be fished out. The sensitivity of large groupers, such as Nassau grouper and Jewfish, to fishing pressure makes them an indicator of the healthiest reef fish communities. Catches of large groupers in the landings data for 1997 were less than 100 kg. They are the only important group in the deep slope fishery.

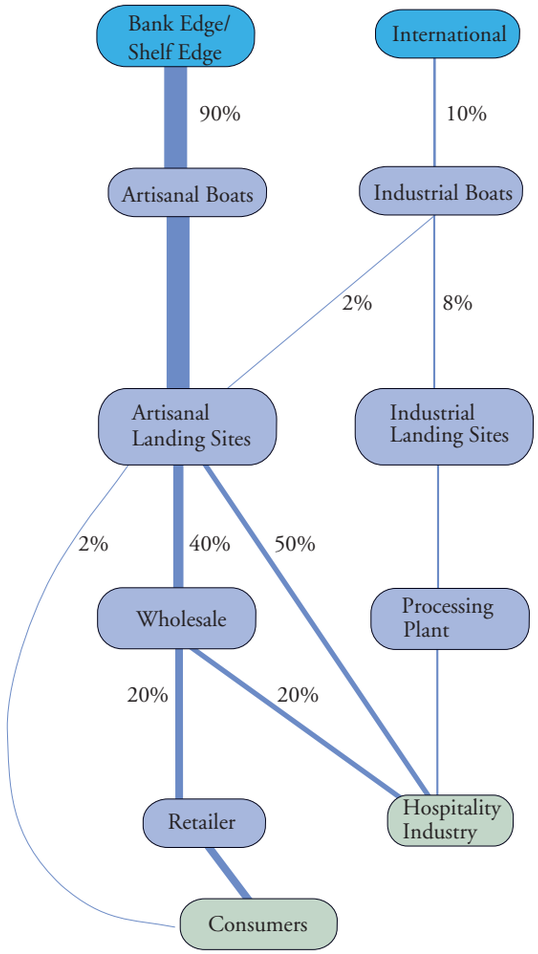
The large groupers are all members of a large subfamily of mostly reef dwelling fish (*Serranidae: Epinephelinae*). The other members of the serrandid family are usually much smaller as adults and are marketed as part of the mixed reef catch. All the groupers, large or small, are carnivorous, predators on other reef fish and invertebrates. Although many of the largest species of groupers (Nassau grouper, *Epinephalus striatus*, Warsaw grouper *Epinephalus nigritis*, and Jewfish *Epinephalus itajara*) are shallow water reef species, they are only found today in deep waters on the edges of the shelf slope and banks.

Groupers are termed protogynic hermaphrodites. This means that each individual fish starts life as a female and, after reproducing by eggs for a number of years, transforms into a male at a certain size or age. This can mean that intense fishing pressure on larger fish could remove too many of the males, and many of the available females may be unable to reproduce.

Nassau Grouper *(Epinephalus striatus)*

Distribution of Deep Slope and Bank Fish

From Fishing Grounds to Consumer



Coastal Pelagics

Coastal pelagics are made up of a number of different species and families of fish. What they have in common is they live, at least as adults, in the mid-water (pelagic) environment over seagrass beds and other coastal areas inshore of the reefs. One family, the jacks and their relatives (*Carangidae*) are larger and variable in shape. They range from slim and torpedo-shaped (fusiform) to deep-bodied and strongly laterally compressed. Most of the other families in this group are smaller species such as herrings (*Clupeidae*), anchovies (*Engraulidae*) and mojaras (*Gerreidae*). These are small-bodied, schooling species, most are shiny and silvery in colour.

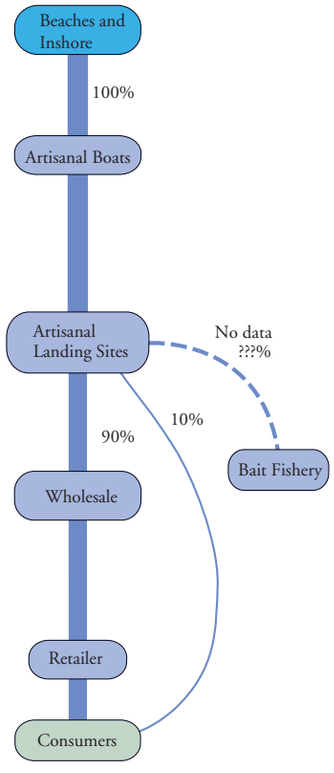
MANAGEMENT STATUS:
Overexploited

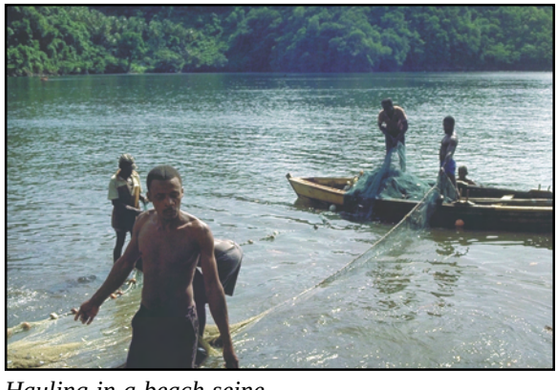
MANAGEMENT GOAL:
Biological sustainable use of the fishery resources for the social (employment) benefits to the individuals who exploit the resources of the coastal areas.

MANAGEMENT ACTIONS:

1. **Conservation Measures** will be developed with a goal of rehabilitating of the coastal pelagic fisheries to sustainable levels. The most direct approach will be to control fishing effort. This will mean controlling and eventually reducing the numbers of boats and fishers in these fisheries. In addition, protecting or enhancing the natural habitat is one of the most important measures for protecting the coastal pelagic fisheries. Because of their dependence on near-shore habitat, they are vulnerable to land-based effects, such as sewage, agricultural run-offs and siltation, and outright destruction such as mangrove clearing, dredging and blasting of reefs, and sand mining.
2. **Integrated Coastal Zone Management Measures** will include the measures to protect these fisheries into the planning for all coastal zone activities. By ensuring that the NRCA and related NGO's include healthy coastal fisheries in their requirements, we will ensure that any planned coastal development or inland activities, that could directly or indirectly affect this ecosystem, will adopt measures to protect it. Instituting pollution abatement measures for existing developments and activities through the NRCA and integrated rural development will help alleviate land-based activities which affect the fishery.

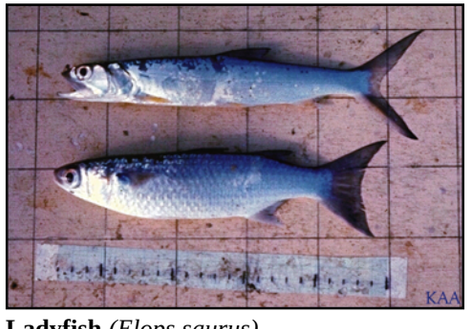
Distribution of Coastal Pelagic Fish
From Fishing Grounds to Consumer





Hauling in a beach seine

Ladyfish *(Elops saurus)*



Ladyfish *(Elops saurus)*
Mullet *(Mugil sp.)*

Small Coastal Pelagics

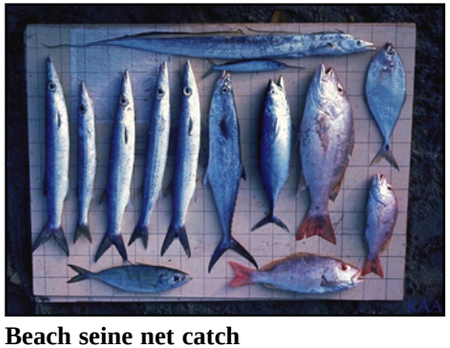
Anchovy, herring, halfbeaks, mojarra
Engraulididae, clupeidae, hemiramphidae, gerreidae

The small coastal pelagics fishery includes species from various families of fish including herrings (*Clupeidae*), anchovies (*Engraulididae*), mojarras (*Gerreidae*) among others. All of these are schooling species which form large, densely packed schools. They live in coastal marine waters and some species may inhabit brackish waters. Although small coastal pelagics are the basis of some of the largest fisheries in the world, in Jamaica they are limited to local consumption or provision of bait or animal feeds.

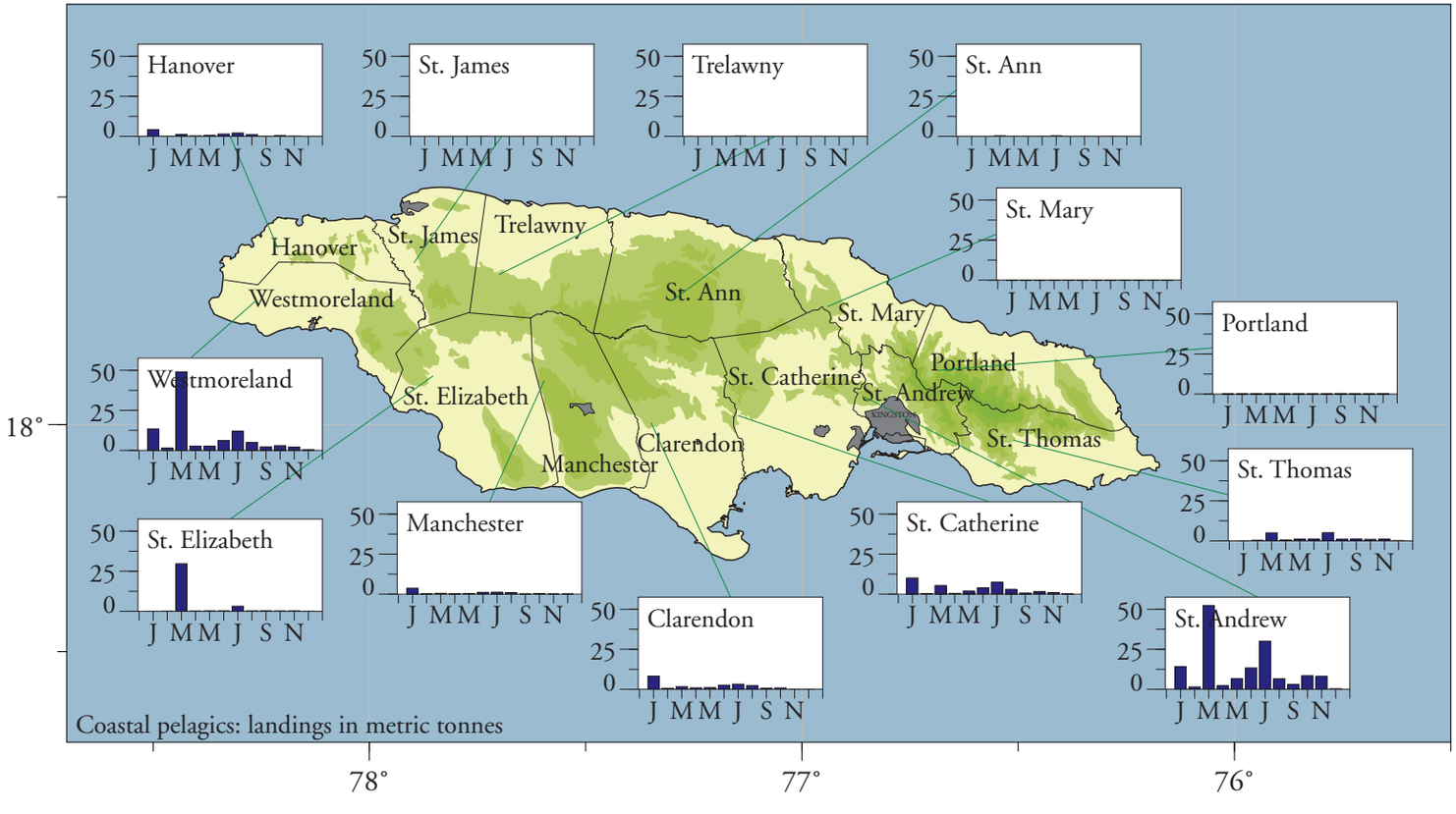
Selling scads at a roadside market stand

Beach Seine

Bonefish *(Albula vulpes)*



Beach seine net catch

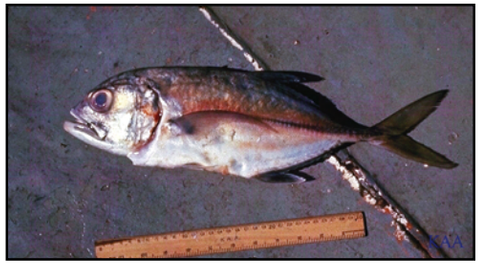


Landings (metric tonnes) of small coastal pelagics in 1997.

Jacks

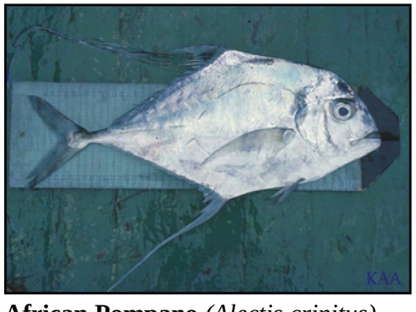
Jacks are representative members of the family *Carangidae* that also includes a number of well-known game fish such as the pompanos and runners. There are also a number of less well-known species of scads, bumpers and leatherjackets, which are typically smaller and more coastal in distribution. Given the large number of species in this group, over 30 in the Caribbean, they are variable in size and appearance. Some, such as the true jacks (*Caranx sp*.) or the blue runner (*Elagatis bipinnulata*) are streamlined and torpedo-shaped while others, such as the pompanos (*Trachinotus sp*.), are deep-bodied and strongly compressed laterally. The smaller species, scads, leatherjackets and bumpers, are usually slim-bodied and streamlined and move in large and dense schools. Almost all carangids have counter-shaded coloration which means they have blue-green backs and whitish or silvery bellies. This colour pattern makes it difficult for predators to see them, either from above, against the deeper, blue waters, or from below against the bright surface of the water.

Greater Amberjack *(Seriola dumerili)*

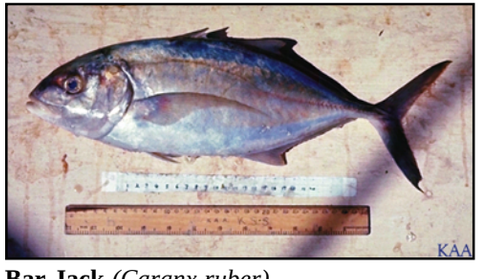


Horseeye Jack *(Caranx latus)*

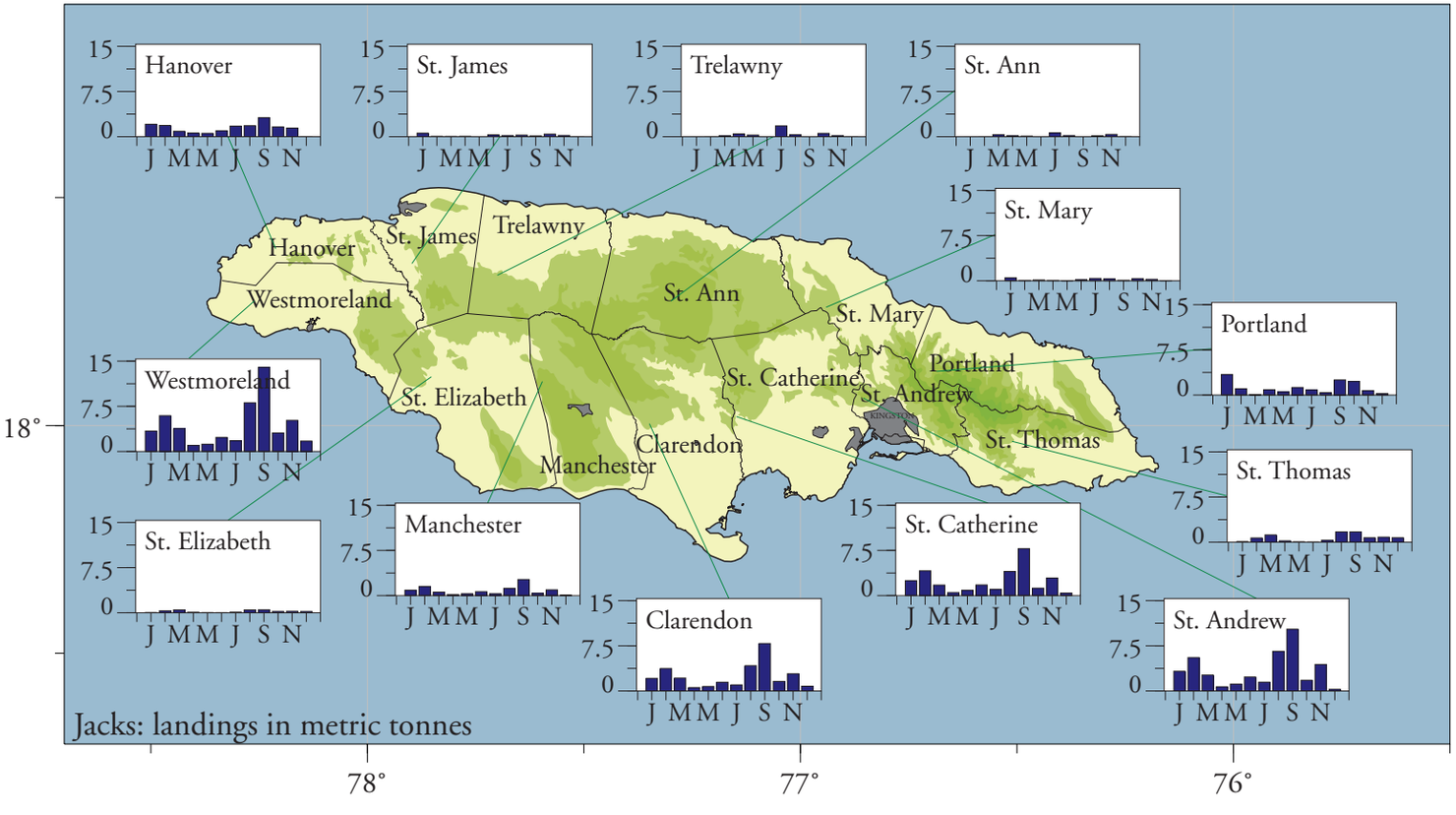
Almaco Jack *(Seriola riviolana)*



African Pompano *(Alectis crinitus)*



Bar Jack *(Caranx ruber)*



Landings (metric tonnes) of jacks in 1997.

Offshore Pelagics

Offshore pelagic (from the Greek *pelagos*, meaning ocean) species are those which live in open waters, not associated with reefs or coastal areas. These pelagic species are strong swimmers, with streamlined bodies, narrow fins and shiny colouration, dark above and silvery below. While they are usually found in areas of great depth, they live in, and are caught in, the upper parts of the water column, near the surface. There are four important groups for fisheries purposes; mackerels, dolphinfish, tunas (including billfish and swordfish) and sharks. Because of the very narrow island shelf on the north coast of Jamaica, which gives fishers access to deep waters very near to shore, the offshore pelagic fishery is predominantly conducted in the north coast waters.

Most of these species are highly migratory with ranges extending throughout the wider Caribbean (mackerels, dolphinfish, sharks and small tuna species) or, in the cases of yellowfin tuna, billfish and swordfish, throughout the western Atlantic and possibly even into the eastern Atlantic. Because the migrations of these species carry them away from Jamaica for parts of the year, the fisheries for offshore pelagics are highly seasonal.

The growth rates, mortality rates, spawning and fecundity are all poorly known for most of these species.

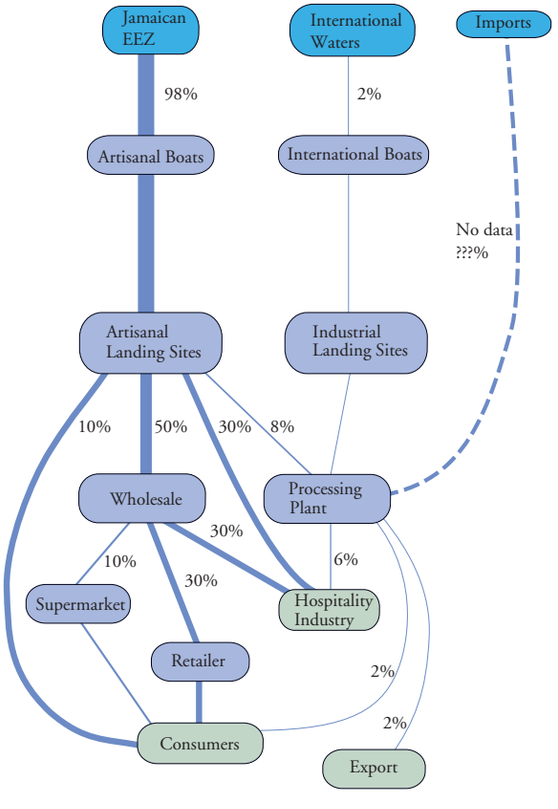
MANAGEMENT STATUS:
Under-utilized in Jamaican waters however the migratory nature of these species requires that management and conservation measures be coordinated at regional and Atlantic scales.

MANAGEMENT GOAL:
Biological sustainable use of the fisheries resources for social benefits (employment) to the fishers.

MANAGEMENT ACTIONS:
Conservation measures are developed in cooperation with International Commission for the Conservation of Atlantic Tunas for the tunas, billfish and swordfish species for management units defined as the western Atlantic or the entire Atlantic. Conservation measures for the smaller species, which are distributed within the wider Caribbean, are developed at the regional and sub-regional levels, for management units defined within the Caribbean or eastern Caribbean.

Socio-economic measures taken to develop the offshore pelagic fisheries in Jamaica include the introduction of appropriate fishing technology for small-scale fishers to efficiently and safely access these resources, development of the recreational fishery for these species within the tourism sector, development of proper marketing and processing capacity for these species. The use of fish aggregating devices (anchored floats to which many pelagic species are attracted) is under consideration.

Distribution of Offshore Pelagic Fish
From Fishing Grounds to Consumer



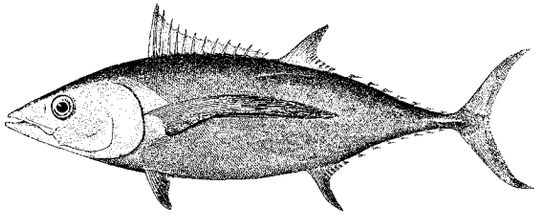
Tuna

Tunas are the largest members of the family *Scombridae* which includes the tunas, mackerels, wahoo, bonito and others. They range from the smaller skipjack tuna (*Katsuwomis pelamis*), less than 1 metre long, to the yellowfin tuna (*Thunnus albacares*) reaching up to 2 metres, or the giant bluefin tuna (*Thunnus thynnus thynnus*) able to grow over 3 metres in length. The yellowfin is the largest species regularly found in Jamaican waters. All the *scombridae* have tapered cylindrical bodies with very stiff fins and various keels and finlets ahead of the tail. All these species are powerful swimmers, undertaking extensive feeding and spawning migrations, in the case of the tunas moving throughout the Caribbean and north Atlantic annually. As a result of these migrations the fisheries for most species are highly seasonal. Trolling and rod and reel fishing for tunas are important tourist fisheries.

Bonito *(Sarda sarda)*

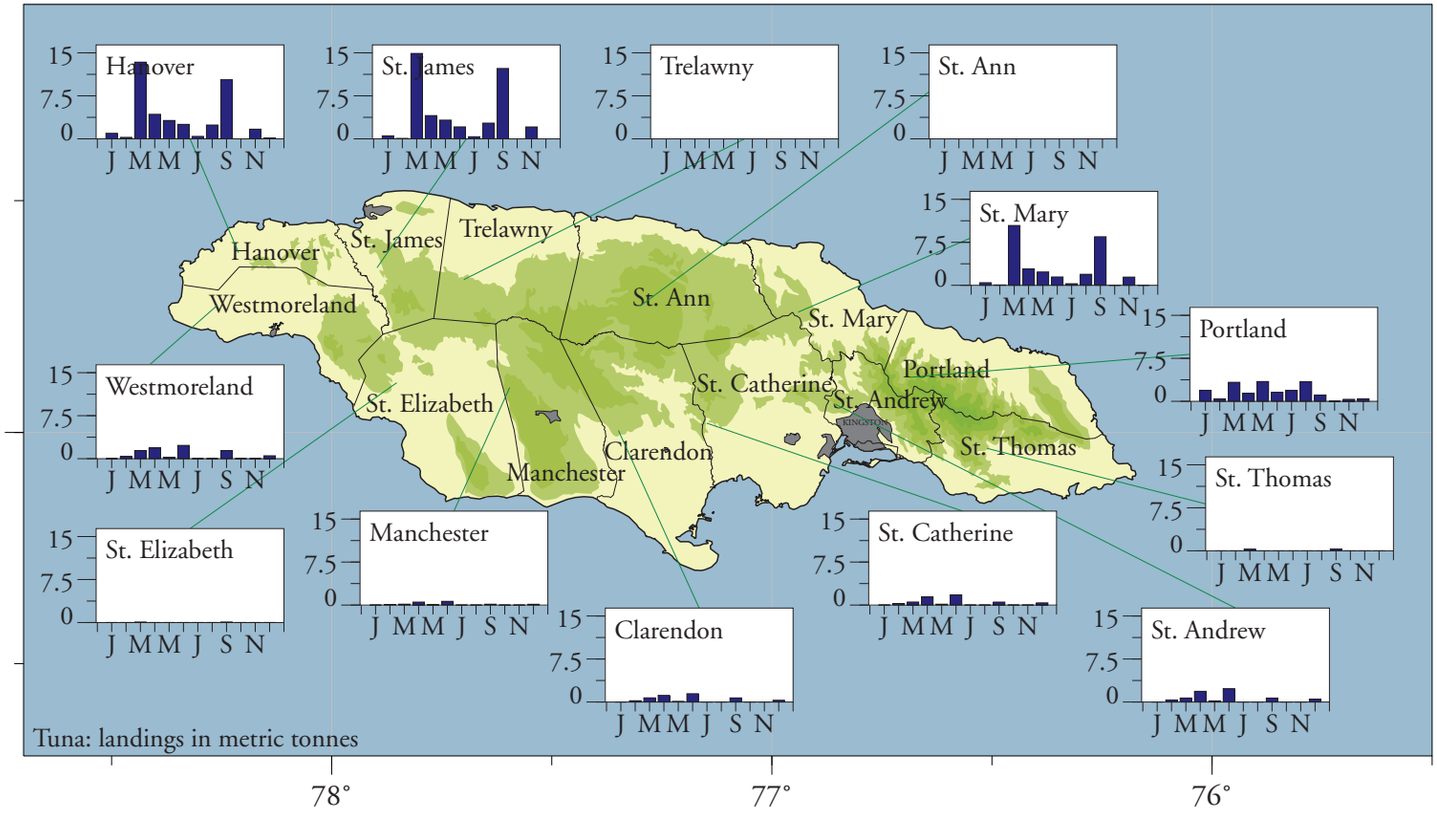
Blackfin Tuna *(Thunnus atlanticus)*

Little Tunny *(Euthynnus alletteratus)*



Albacore *(Thunnus alalunga)*

Yellowfin Tuna *(Thunnus albacares)*



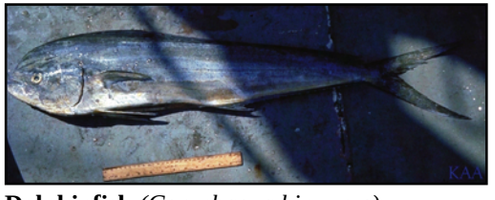
Landings (metric tonnes) of tunas in 1997.

Skipjack Tuna
(Katsuwonus pelamis)

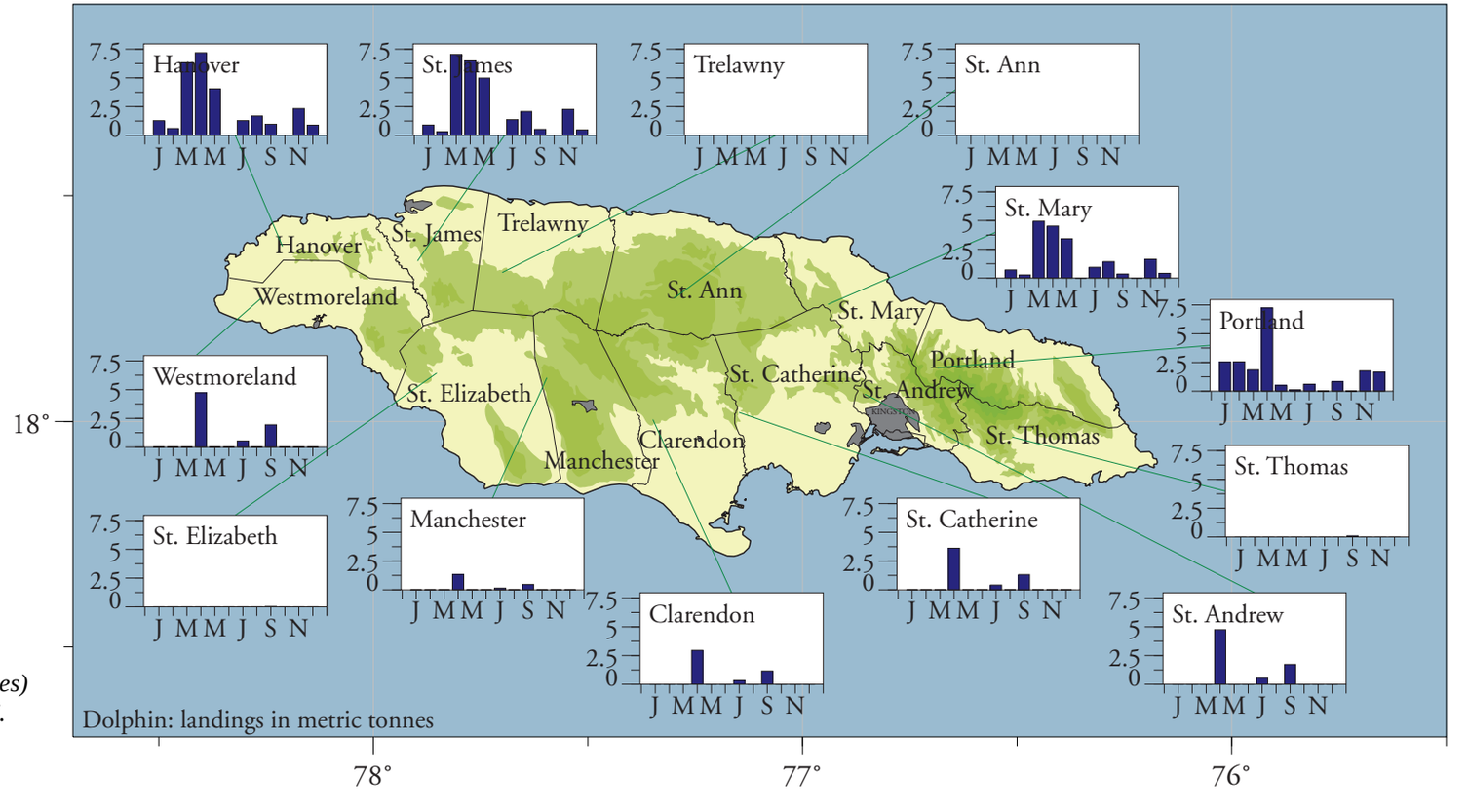
Dolphinfish

The dolphinfish (*Coryphaena hippurus*) is a true fish and not related in any way to the marine mammals also called dolphins. It is also known as mahi-mahi and dorado. This species is a pelagic oceanic species that migrates annually throughout the north Atlantic. As a result of these migrations it is highly seasonal in any one area and the great majority of the Jamaican catch is taken from March to May. Like tunas, it is an important sport species and is caught mostly by trolling or rod and reel.

Dolphinfish *(Coryphaena hippurus)*



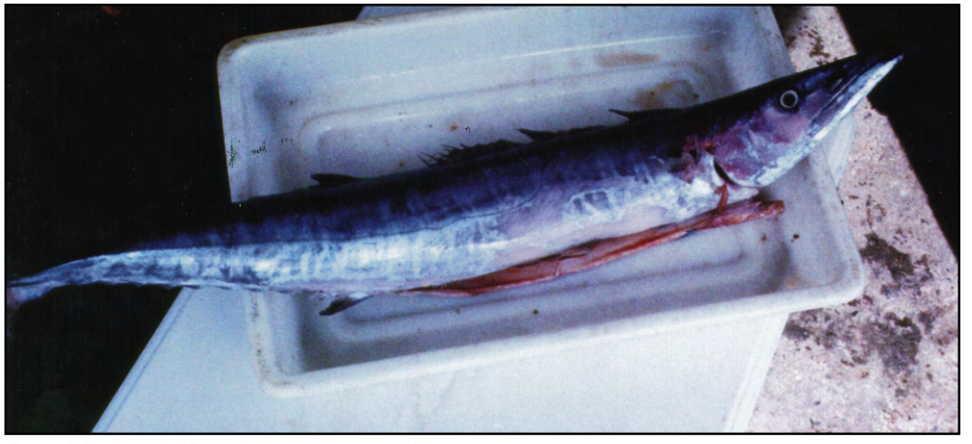
Dolphinfish *(Coryphaena hippurus)*



Landings (metric tonnes) of dolphinfish in 1997.

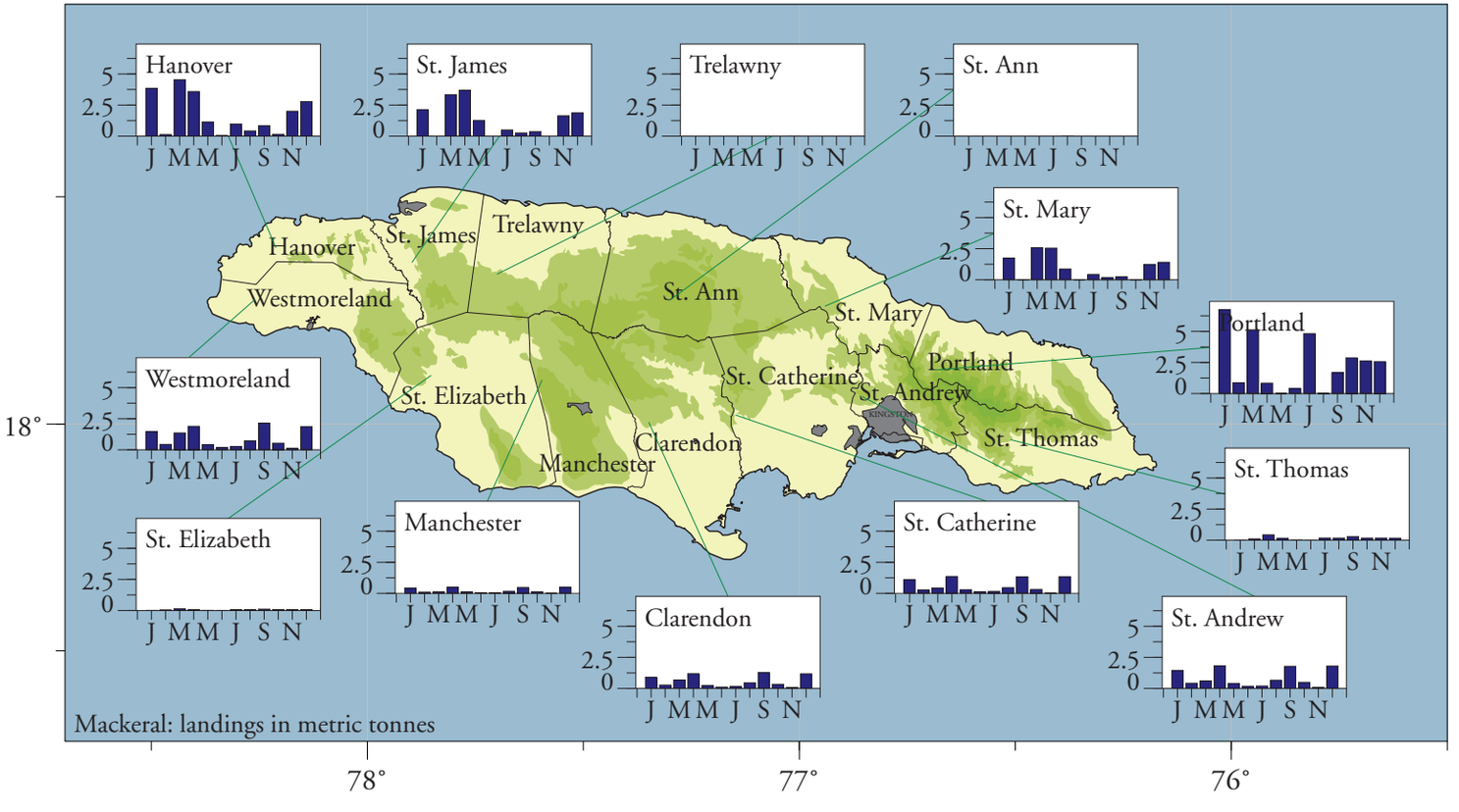
Makerel

The mackerels (*Scomberomorus sp., Scomber japonicus, Acanthocybium solandri* and *Auxis sp*.) are the smaller members of the family *Scombridae* which includes the tunas, mackerels, wahoo, bonito and others. Most species are commonly in the range of 50 to 80 cm although the wahoo (*Acanthocybium solandri*) commonly grows to more than a metre in length. All the *scombridae* have tapered cylindrical bodies with very stiff fins and various keels and finlets ahead of the tail. All these species are powerful swimmers, undertaking extensive feeding and spawning migrations. The migrations of the mackerels are not as wide-ranging as the tunas. Many species have distinctive mottled or barred patterns in iridescent blues or greens on the upper parts of the body, becoming paler towards the belly.



Cero Mackerel *(Scomberomorus regalis)*

Landings (metric tonnes) of mackerels in 1997.



Sharks

Sharks are a very minor part of the fisheries landings in Jamaica. Two coastal or reef-dwelling species do show up in the artisanal catch, mostly consumed locally. These are the nurse shark (*Ginglymostoma cirratum*) and the small (less than 1 metre) Caribbean sharpnose shark (*Rhizoprionodon porosus*).

Nurse Shark *(Ginglymostoma cirratum)*

Lobster

The Caribbean spiny lobster (*Panulirus argus*) is the most valuable lobster species in the western Atlantic with fisheries extending from North Carolina in the USA to Rio de Janeiro in Brazil. This large lobster grows to 45 cm total length and may live more than ten years in the absence of fishing. The larval stages of this species can spend from six months to as much as a year in the plankton, drifting on the ocean currents. For this reason it is very difficult to relate recruiting juveniles to a parental stock. The juveniles, when they settle out of the plankton, inhabit shallow coastal areas such as mangrove and sea grass beds and move into deeper water and offshore reefs as they grow and mature.

The lobster fishery has both an artisanal and an industrial sector. The industrial sector fishes on the offshore banks using rectangular wooden slatted traps specifically for lobster. The artisanal sector fishes primarily on the south shelf by diving (free-lung, hoocha and SCUBA), nets or Antillean wire 'Z' traps. The small north coast fishery uses diving or Antillean traps on the near-shore reefs. The Antillean 'Z' (or 'S') traps are multi-species traps taking both reef fish and lobsters.

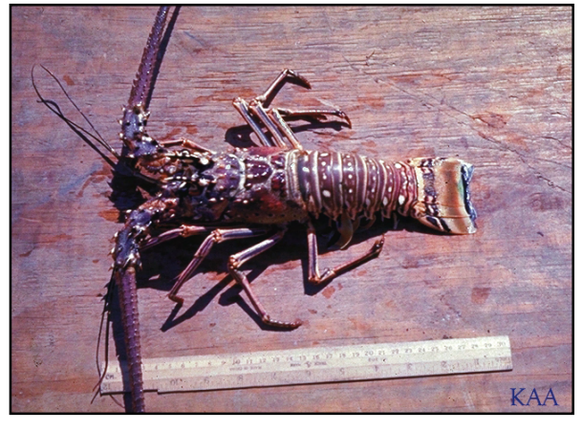
Spotted Spiny Lobster
(Panulirus guttatus)

MANAGEMENT STATUS:
Over-exploited

MANAGEMENT GOAL:
Biological sustainable use of the fishery resources in order to ensure present and future economic earnings from the fishery.

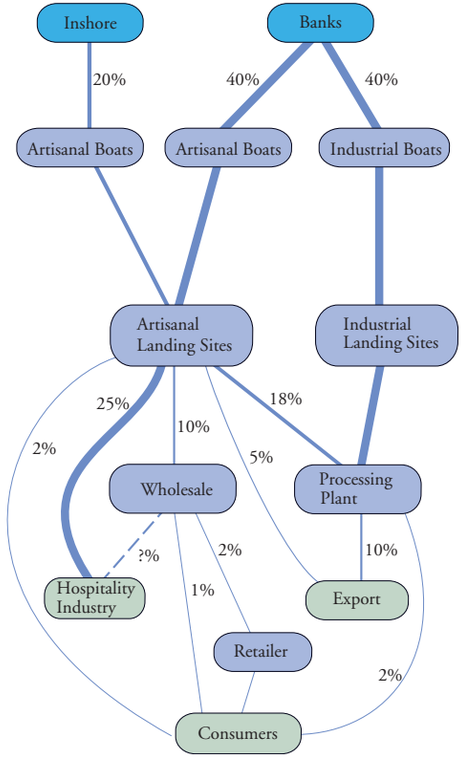
MANAGEMENT ACTIONS:

1. **Conservation Measures** will be developed with a goal of rehabilitating the lobster stocks to maintain fisheries at sustainable levels. Current management measures include a closed season for the months of April to June for all lobster fishers. Also, the industrial fishery operates under a limited access system that controls the numbers of industrial vessels. Enforcement includes end-of-season declarations of lobster by the processors and inspections of fish plants, hotels, beaches, and restaurants to ensure closed season is respected.
2. **Social and economic measures** will seek to regulate and develop the lobster processing sector will be made with a view to increasing the market value through processing standards and utilisation of current waste products such as heads.



Carribean Spiny Lobster
(Panulirus argus)

Distribution of Lobster
From Fishing Grounds to Consumer

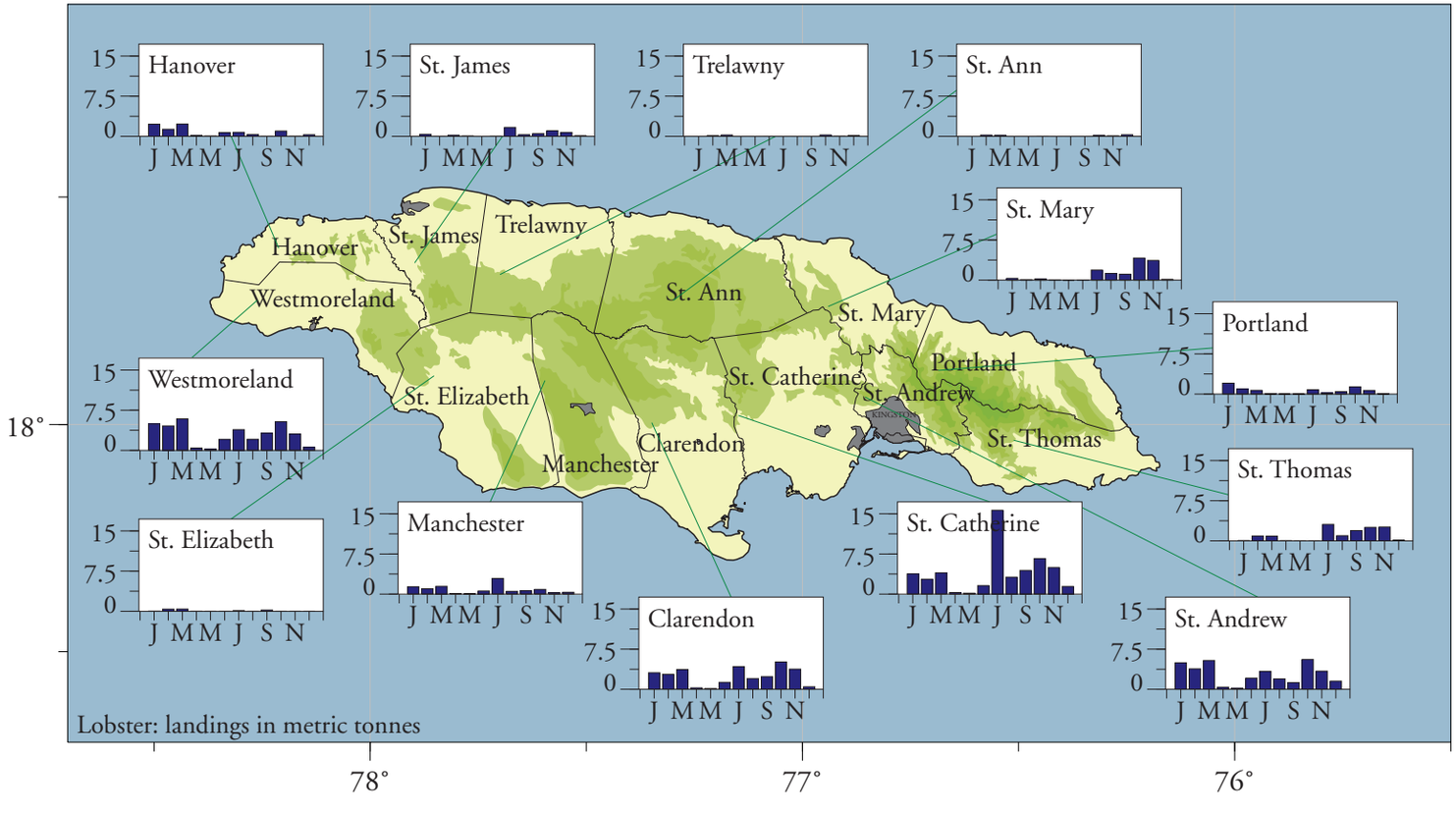


MANAGEMENT OPTIONS:

Additional management options are being considered include:

1. Extending the duration of the closed season to cover the lobster spawning season.
2. Prohibiting the sale, processing and importation of lobster during the closed season. This will reduce the opportunities for out-of-season lobster being passed off as legal lobster.
3. Additional fishery controls such as regulating the use traps to restrict the numbers of traps, require that biodegradable escape panels be included in traps and that traps be legally marked.
4. Increase the minimum size restriction for lobster to reduce growth over-fishing and help ensure that individuals are allowed to mature and reproduce before being legally fished to reduce recruitment over-fishing.
5. Prohibit the capture of moulting lobsters and egg-bearing (berried) lobsters as well as prohibiting the removal of eggs from a berried female.

Spiny Lobster measurement *(Panulirus argus)*



Landings (metric tonnes) of spiny lobsters in 1997.

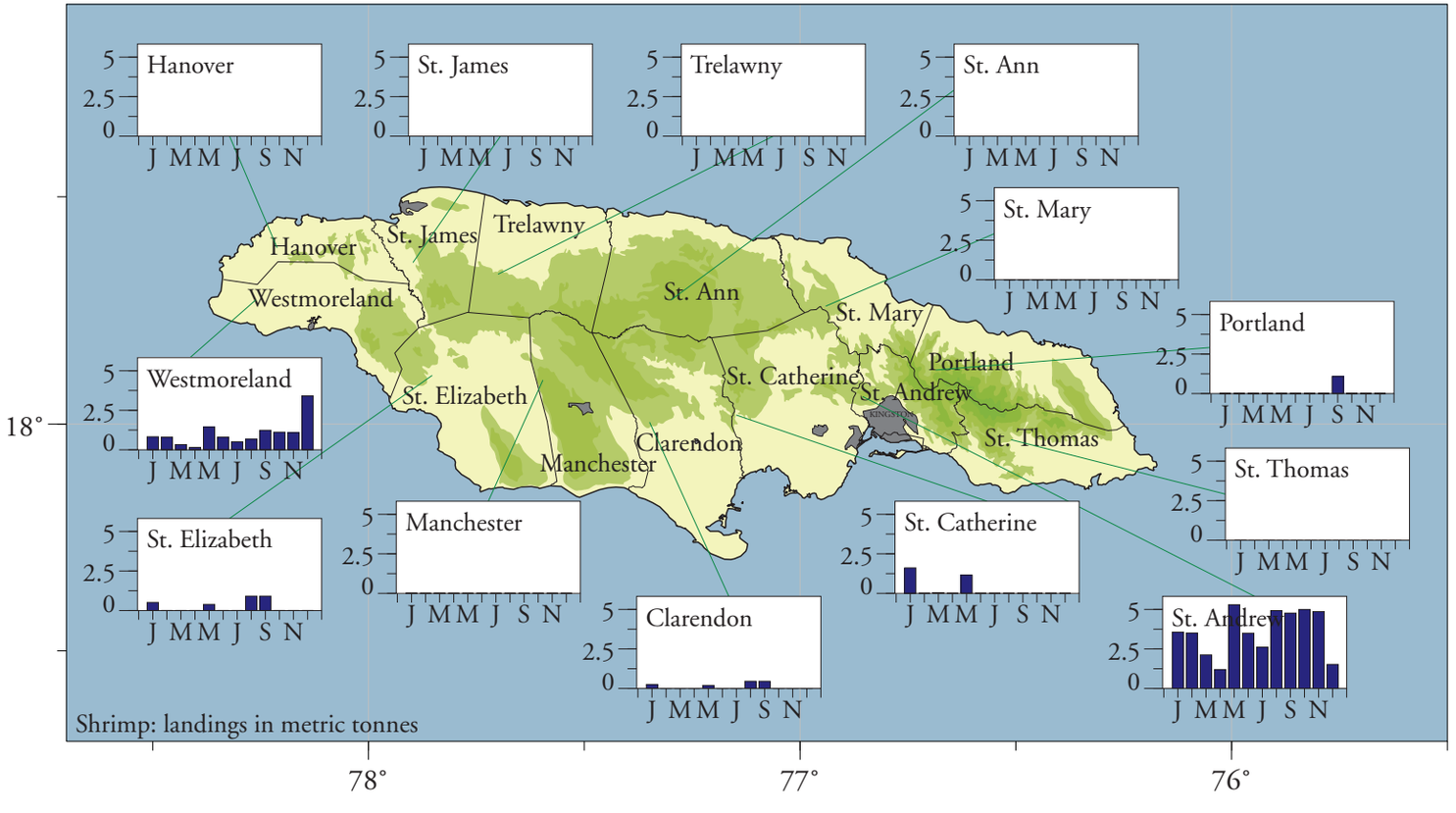
Shrimp

Several important species of shrimp are taken in the Jamaican fishery for example Southern white shrimp (*Penaeus schmitti*) and Southern brown shrimp (*Penaeus subtilis*) among others. All of these species inhabit brackish waters as juveniles with known concentrations in Kingston Harbour while the adults are fully marine. The adults are found on mud, sandy mud and soft sediment bottoms. The Jamaican fishery is entirely artisanal and operates on the south shelf using small seines or trawls while a bait fishery uses hand-operated push nets to capture juveniles in shallow waters.

MANAGEMENT STATUS:
Unknown

MANAGEMENT GOAL:
Biological sustainable development and management of the fishery to ensure present and future economic earnings from the fishery and make a greater contribution on the local market.

White Shrimp *(Penaeus scmitti)*



Landings (metric tonnes) of shrimp in 1997.

MANAGEMENT ACTIONS:

1. **Conservation Measures** will focus on the protection of nursery areas and critical habitat to enhance survival of juveniles. Conduct of fisheries-independent studies to assess the productivity of individual fishing grounds, reduce effort to rehabilitate depleted areas and maintain production through closed areas and seasons.
2. **Social and economic measures** will reduce gear conflicts by zoning fishing grounds by gear type. Development of the fishery will be assisted by investigation of marketing opportunities.
3. **Integrated Coastal Zone measures** will be implemented jointly with the Natural Resources Conservation Agency.

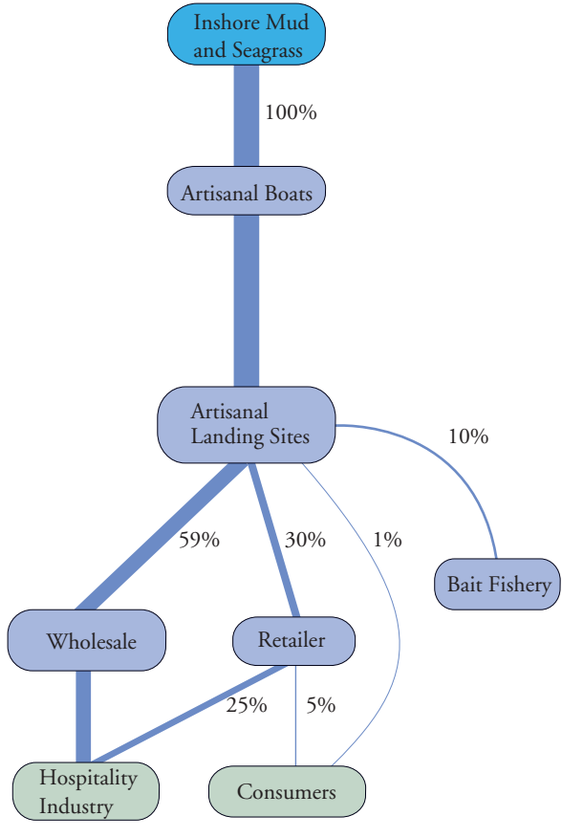
MANAGEMENT OPTIONS:

Additional management options are being considered include:

1. Regulation of fishing seasons and zones.
2. Effort reduction and gear restrictions.
3. Co-management arrangements based on the artisanal nature of the shrimp fishery.
4. Habitat management.

Distribution of Shrimp

From Fishing Grounds to Consumer



Conch

Jamaica is the world's largest producer and exporter of the Queen Conch (*Strombus gigas*). In recent years the exports, which account for 95% of the total catch, have been about 1800 tonnes with a landed value of over J$500 million (US$15 million) making it Jamaica's economically most valuable fishery. Conch remains an abundant and productive stock in Jamaica however, because conch is listed as an 'at risk' species under the Convention on International Trade in Endangered Species, a careful system of export quotas is required to comply with the provisions of that Convention.

The conch fishery is concentrated on the south coast with the vast majority of the catch coming from the offshore banks (~99%) and the rest from the south shelf. The fishery is divided into an industrial and an artisanal sector. The 11 companies in the industrial sector operate large (greater than 20 metres) steel-hulled vessels under foreign charters. These vessels have many divers using hoocha (air supplied by hose from a compressor on the surface) or SCUBA gear. The industrial sector plants also buy conch from artisanal fishers, carrier boats and middlemen. The artisanal sector traditionally harvested conch by free-lung diving (i.e. no breathing apparatus) but they have had to adopt hoocha and SCUBA gear as the shallow water stocks have been depleted. Now, most of them operate from the offshore cayes (Pedro and Morant) during the conch season. In addition to the divers and captains of the artisanal vessels there is also a network of middlemen and artisanal processors who provide financing, supplies and transport of conch for the fishers based on the offshore cayes.

MANAGEMENT STATUS:
Fully to over-exploited

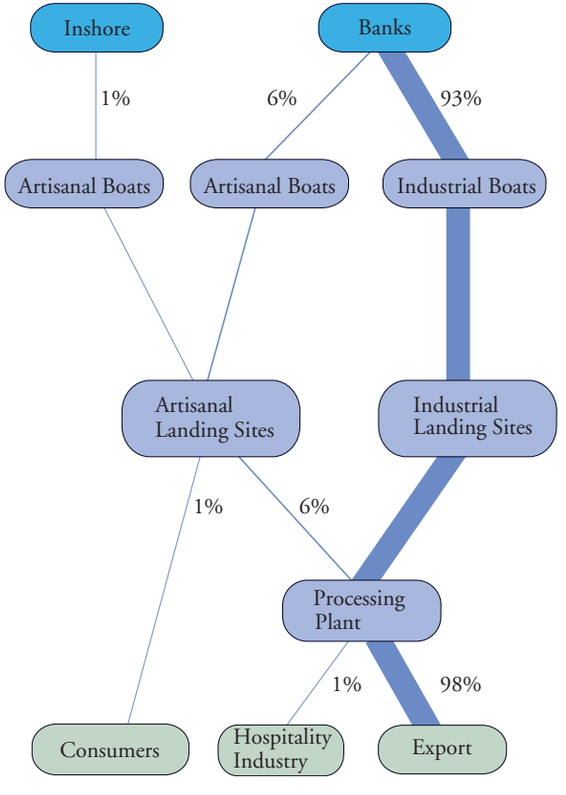
MANAGEMENT GOAL:
Biological sustainable use of the fishery resources in order to ensure continued economic earnings from the fishery.

MANAGEMENT ACTIONS:

1. **Conservation Measures** will be developed with a goal of rehabilitating the conch stocks to maintain fisheries at sustainable levels. Current management measures include a closed season for the months of July to October for all conch fishers. Also, the industrial fishery operates under quotas allocated to the individual companies and a limited access system which controls the numbers of industrial vessels and the numbers of divers on those vessels. Enforcement includes end-of-season declarations of conch by the exporters and plant inspections to ensure closed season is respected.
2. **Social and economic measures** will seek to maintain, or increase if possible, the foreign exchange earnings to Jamaica. As well, efforts to regulate and develop the conch processing sector will be made with a view to increasing the market value through processing standards and regulating the minimum level of processing. Finally, maintain, at least at current levels, the local availability of conch for residents and tourists.

Conch landed at processing plant

Distribution of Conch
From Fishing Grounds to Consumer

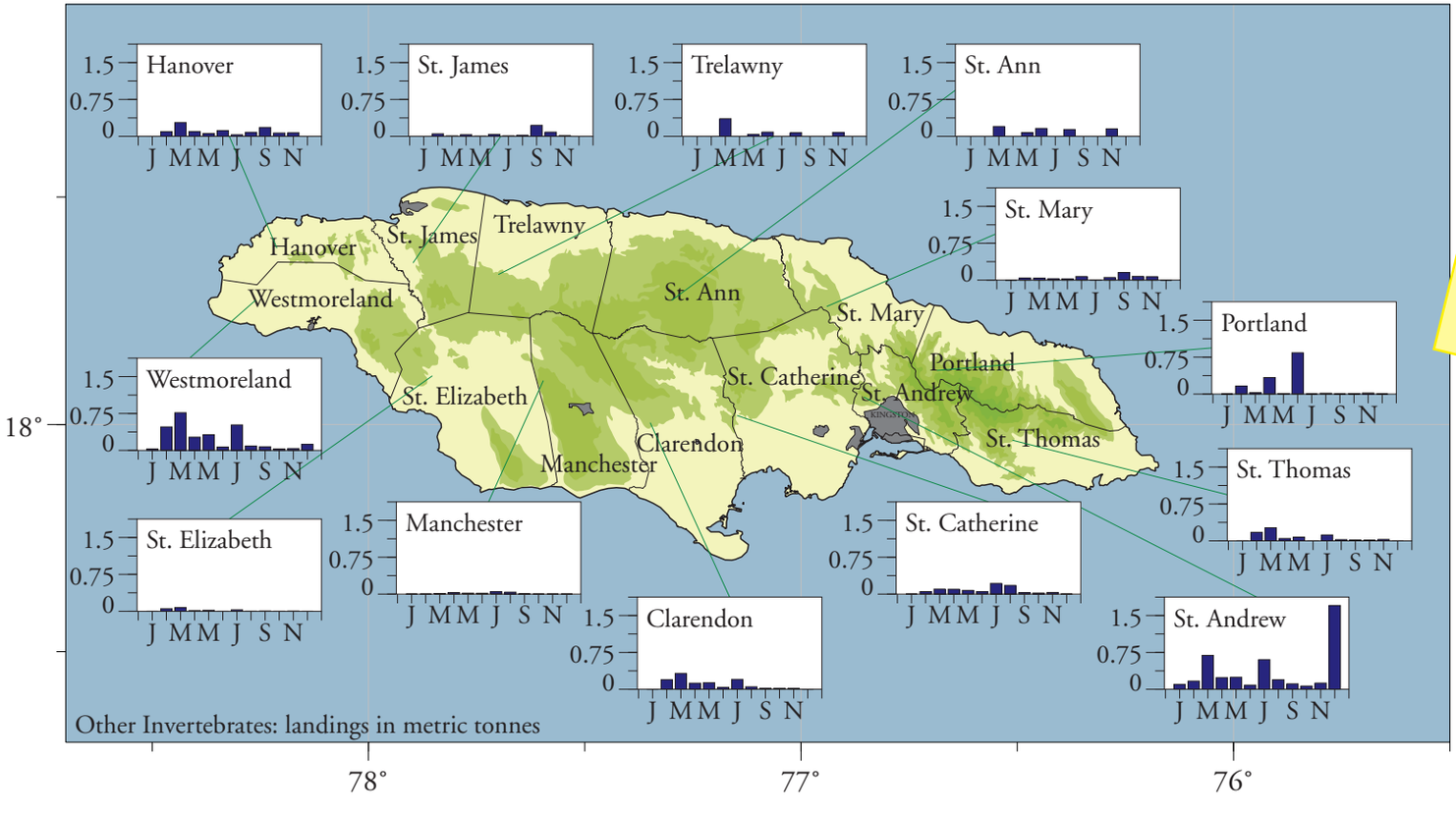


MANAGEMENT OPTIONS:

Given the importance of conch in Jamaica, a number of additional management options are being considered. They include:

1. Extending the duration of the closed season
2. Prohibiting the sale, processing and importation of conch during the closed season. This will reduce opportunities for out-of-season conch being passed off as legal conch.
3. Additional fishery controls such as regulating the use of SCUBA and hoocha breathing gear by divers, establishing fishing areas for artisanal-only fishing, and enhancing the quota system.
4. Establish a minimum size restriction for conch to include a minimum shell length corresponding to minimum meat weight to reduce growth over-fishing. Reduce recruitment over-fishing by determining sizes corresponding to a minimum flared-lip thickness for the shell. This will help ensure that individuals are allowed to mature and reproduce before being legally fished as it is felt that the development of the flared-lip on the shell is an indication of sexual maturity.
5. Investigate supplementing recruitment from natural production by stocking hatchery-produced juveniles on depleted conch grounds.

Conch processing



The industrial fishery accounts for approximately another1800 tonnes, almost 95% of all conch landed, not included in this map.

Artisanal landings (metric tonnes) of conch in 1997.

SPECIES LIST BY MARKET CATEGORIES

Category: Quality Reef Fish

Family	Scientific name	Common name
Haemulidae		Grunts
	Haemulon album	Margate, White
Labridae		Wrasses
	Bodianus rufus	Hogfish, Spanish
	Halichoeres garnoti	Wrasse, Yellowhead
	Halichoeres radiatus	Puddingwife
	Lachnolaimus maximus	Hogfish
Mugilidae		Mullets
	Mugil cephalus	Mullet, Striped
	Mugil curema	Mullet, White
Mullidae		Goatfishes
	Mulloidichthys martinicus	Goatfish, Yellow
	Pseudupeneus maculatus	Goatfish, Spotted
Priacanthidae		Bigeyes
	Priacanthus cruentatus	Glasseye
Scaridae		Parrotfishes
	Scarus coelestinus	Parrotfish, Midnight
	Scarus coeruleus	Parrotfish, Blue
	Scarus taeniopterus	Parrotfish, Princess
	Scarus vetula	Parrotfish, Queen
	Sparisoma chrysopterum	Parrotfish, Redtail
	Sparisoma rubripinne	Parrotfish, Redfin
	Sparisoma viride	Parrotfish, Stoplight
Serranidae		Groupers and Seabasses
	Alphestes after	Hamlet, Mutton
	Cephalopholis cruentata	Seabass, Grasby
	Cephalopholis fulva	Seabass, Coney
	Epinephelus adscensionis	Hind, Rock
	Epinephelus guttatus	Hind, Red
	Epinephelus striatus	Grouper, Nassau
	Hypoplectrus indigo	Hamlet, Indigo
	Mycteroperca bonaci	Grouper, Black
Sparidae		Porgies and Seabreams
	Calamus calamus	Porgy, Saucereye
Sphyraenidae		Barracudas and Sennets
	Sphyraena picudilla	Sennet, Southern

Category: Common Reef Fish

Family	Scientific name	Common name
Centropomidae		Snooks
	Centropomus pectinatus	Snook, Tarpon
	Centropomus undecimalis	Snook, Common
Haemulidae		Grunts
	Anisotremus virginicus	Porkfish
	Haemulon bonariense	Grunt, Black
	Haemulon carbonarium	Grunt, Caesar
	Haemulon chrysargyreum	Grunt, Smallmouth
	Haemulon flavolineatum	Grunt, French
	Haemulon macrostomum	Grunt, Spanish
	Haemulon parrai	Grunt, Sailor's
	Haemulon plumieri	Grunt, White
	Haemulon sciurus	Grunt, Bluestriped
	Haemulon striatum	Grunt, Striped
Kyphosidae		Sea chubs
	Kyphosus sectatrix	Sea chub, Bermuda
Lobotidae		Tripletails
	Lobotes surinamensis	Tripletail, Atlantic
Scaridae		Parrotfishes
	Sparisoma aurofrenatum	Parrotfish, Redband
Sciaenidae		Drums
	Bairdiella ronchus	Croaker, Ground
	Equetus punctatus	Drum, Spotted

Category: Trash Reef Fish

Family	Scientific name	Common name
Acanthuridae		Surgeonfishes
	Acanthurus bahianus	Ocean surgeon
	Acanthurus chirurgus	Doctorfish
	Acanthurus coeruleus	Blue tang surgeonfish
Albulidae		Bonefishes
	Albula vulpes	Bonefish
Ariidae		Sea Catfishes
Balistidae		Triggerfishes
	Balistes capriscus	Triggerfish, Grey
	Balistes vetula	Triggerfish, Queen
	Canthidermis sufflamen	Triggerfish, Ocean
	Melichthys niger	Durgon, Black
Bothidae		Flounders, Lefteye

Category: Trash Reef Fish (continued)

Family	Scientific name	Common name
Chaetodontidae		Butterflyfishes
	Chaetodon striatus	Butterflyfish, Banded
	Chaetodon capistratus	Butterflyfish, Foureye
	Chaetodon ocellatus	Butterflyfish, Spotfin
Congridae		Conger eels
Diodontidae		Porcupinefishes
	Diodon hystix	Porcupinefish
Echeneididae		Remoras
	Echeneis naucrates	Sharksucker
Ephippidae		Spadefishes
	Chaetodipterus faber	Spadefish, Atlantic
Exocoetidae		Flyingfishes
Grammistidae		Soapfishes
	Rypticus saponaceus	Soapfish, Greater
Holocentridae		Squirrelfishes
	Holocentrus adscensionis	Squirrelfish
	Holocentrus rufus	Squirrelfish, Longspine
	Myripristis jacobus	Blackbar soldierfish
Labridae		Wrasses
	Clepticus parrai	Wrasse, Creole
	Halichoeres garnoti	Wrasse, Yellowhead
Malacanthidae		Tilefishes
	Malacanthus plumieri	Tilefish, Sand
Monacanthidae		Filefishes
	Aluterus scriptus	Filefish, Scrawled
	Cantherhines macrocerus	Filefish, Whitespotted
	Cantherhines pullus	Filefish, Orangespotted
Muraenidae		Morays
	Gymnothorax funebris	Moray, Green
	Gymnothorax moringa	Moray, Spotted
	Gymnothorax vicinus	Moray, Purplemouth
	Muraena miliaris	Moray, Goldentail
Ophichthidae		Snake eels
Ostraciidae		Boxfishes
	Lactophrys bicaudalis	Trunkfish, Spotted
	Lactophrys polygonius	Cowfish, Honeycomb
	Lactophrys quadricornis	Cowfish, Scrawled
	Lactophrys trigonus	Trunkfish, Buffalo
	Lactophrys triqueter	Trunkfish, Smooth

Category: Trash Reef Fish (continued)

Family	Scientific name	Common name
Pomacanthidae		Angelfishes
	Holacanthus bermudensis	Angelfish, Blue
	Holocanthus ciliaris	Angelfish, Queen
	Holacanthus tricolor	Rock beauty
	Pomacanthus arcuatus	Angelfish, Gray
	Pomacanthus paru	Angelfish, French
Pleuronectidae		Flounders, Righteye
Pomacentridae		Damselfishes
	Abudefduf saxatilis	Sergeant major
	Abudefduf taurus	Sergeant, Night
	Microspathodon chrysurus	Damselfish, Yellowtail
Scaridae		Parrotfish
	Scarus croicensis	Parrotfish, Striped
Scorpaenidae		Scorpionfishes
	Scorpaenodes caribbaeus	Scorpionfish, Reef
Sparidae		Porgies and Seabreams
	Archosargus rhomboidalis	Western atlantic seabream
Synodontidae		Lizardfishes
	Synodus intermedius	Sand diver

Category: Lobster

Family	Scientific name	Common name
Palinuridae		Spiny lobsters
	Panulirus argus	Lobster, Caribbean spiny
	Panulirus guttatus	Lobster, Spotted spiny
Scyllaridae		Slipper lobsters
	Parribacus antarcticus	Lobster, Sculptured slipper

Category: Snapper

Family	Scientific name	Common name
Lutjanidae		Snappers
	Apsilus dentatus	Snapper, Black
	Lutjanus analis	Snapper, Mutton
	Lutjanus apodus	Schoolmaster
	Lutjanus campechanus	Snapper, Red
	Lutjanus griseus	Snapper, Grey

Category: Snapper (continued)

Family	Scientific name	Common name
	Lutjanus jocu	Snapper, Dog
	Lutjanus mahogoni	Snapper, Mahogany
	Lutjanus synagris	Snapper, Lane
	Lutjanus vivanus	Snapper, Silk
	Ocyurus chrysurus	Snapper, Yellowtail
	Pristipomoides aquilonaris	Wenchman

Category: Octopus and Squid

Family	Scientific name	Common name
Loliginidae		Inshore Squids
Octopodidae		Octopuses
	Octopus briareus	Octopus, Caribbean reef
	Octopus vulgaris	Octopus, Common

Category: Coastal Pelagics

Family	Scientific name	Common name
Albulidae		Bonefishes
	Albula vulpes	Bonefish
Belonidae		Needlefishes
Carangidae		Jacks
	Chloroscombrus chrysurus	Bumper, Atlantic
	Oligoplites saurus	Leatherjacket, Atlantic
	Selene vomer	Lookdown, Atlantic
Clupeidae		Herrings
	Alosa aestivalis	Shad, Blueback
	Opisthonema oglinum	Herring, Atlantic thread
	Sardinella aurita	Sardinella, Round
Engraulidae		Anchovies
Gerreidae		Mojarras
	Eucinostomus argenteus	Mojarra, Spotfin
	Eucinostomus gula	Mojarra, Jenny
	Eucinostomus havana	Mojarra, Bigeye
	Eugerres plumieri	Mojarra, Striped
	Gerres cinereus	Mojarra, Yellowfin

Category: Coastal Pelagics (continued)

Family	Scientific name	Common name
Hemiramphidae		Halfbeaks
	Hemiramphus brasiliensis	Ballyhoo
Sciaenidae		Drums
	Bairdiella rhonchus	Croaker, Ground
	Menticirrhus spp.	Kingcroakers
Trichiuridae		Cutlassfishes

Category: Crab

Family	Scientific name	Common name
Portunidae		Swimcrabs
	Arenaeus cribarius	Swimcrab, Speckled

Category: Barracuda

Family	Scientific name	Common name
Sphyraenidae		Barracudas and Sennets
	Sphyraena barracuda	Barracuda, Great

Category: Jacks

Family	Scientific name	Common name
Carangidae		Jacks
	Caranx bartholomaei	Jack, Yellow
	Caranx crysos	Runner, Blue
	Caranx hippos	Jack, Crevalle
	Caranx latus	Jack, Horse-eye
	Caranx lugubris	Jack, Black
	Caranx ruber	Jack, Bar
	Chloroscombrus chrysurus	Bumper, Atlantic
	Elagatis bipinnulata	Runner, Rainbow
	Seriola dumerili	Amberjack, Greater
	Seriola rivoliana	Jack, Almaco
	Trachinotus falcatus	Permit
	Trachinotus goodei	Pompano, Palometa

Category: Dolphin

Family	Scientific name	Common name
Coryphaenidae		Dolphinfishes
	Coryphaena equisetis	Dolphin, Pompano
	Coryphaena hippurus	Dolphinfish, Common

Category: Tuna

Family	Scientific name	Common name
Scombridae		Mackerels and tunas
	Katsuwonus pelamis	Tuna, Skipjack
	Thunnus albacares	Tuna, Yellowfin
	Thunnus atlanticus	Tuna, Blackfin
	Thunnus thynnus thynnus	Tuna, Northern bluefin

Category: Mackerel

Family	Scientific name	Common name
Scombridae		Mackerels and tunas
	Acanthoacybium solandri	Wahoo
	Scomberomorus cavalla	Mackerel, King
	Scomberomorus regalis	Cero
	Scomber scombrus	Mackerel, Atlantic

Category: Shark

Family	Scientific name	Common name
Carcharhinidae		Requiem sharks
	Rhizoprionodon porosus	Shark, Caribbean sharpnose
Orectolobidae		Nurse sharks
	Ginglymostoma cirratum	Shark, Nurse

Category: Marlin

Family	Scientific name	Common name
Istiophoridae		Marlins
	Makaira nigricans	Marlin, Blue

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