

GRENADA (GD)



Fig. 1. Flag of Grenada¹



Fig. 2. Map of Grenada.¹

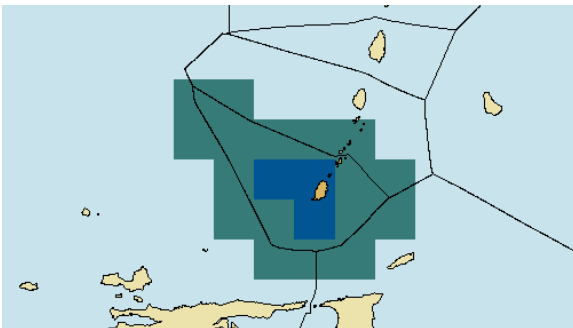


Fig. 3. Map of EEZ of Grenada.²

Geographic Coordinates: 12 07 N, 61 40 W¹

Terrestrial extent (km²): 344 km²¹

Coastline: 121 km¹

EEZ Extent: 27,426 km²²

Shelf Area: 2237 km²²

¹ CIA World Factbook <<https://www.cia.gov/cia/publications/factbook/index.html>>

² Sea Around Us Project <www.searoundus.org>

Marine Fisheries Landings (production in tons): 1.71 (FAO 2001; data from 1998)

Other countries operating in this EEZ:

Government agency for marine fisheries: Fisheries Division - Ministry of Agriculture, Forestry, Lands and Fisheries

Government agency for the protection of the marine environment: Marine resource management is the responsibility of the Fisheries Division, under the Ministry of Agriculture, Lands, Forestry and Fisheries, and the FD is administered by a Chief Fisheries Officer.

Population: 89,703 (July 2006 est.)¹

Description: Grenada is a small island developing state. Formerly a British colony, it gained independence in 1974. It is a tri-island state between Caribbean Sea and Atlantic Ocean, north of Trinidad and Tobago. The three main islands (in order of size and from south to north) are Grenada, Carriacou, and Petite Martinique, although there are approximately 20 low-lying islands in total, many of which are uninhabited, that are dependencies of Grenada. The administration of the islands of the Grenadines group is divided between St. Vincent and the Grenadines, and Grenada, although they work cooperatively, given that they share the Grenadines shelf. English is the official language, but French patois is also spoken. It is the southernmost of the OECS chain of Caribbean countries, as well as the southernmost island of the Lesser Antillean chain.

The Fisheries of Grenada

Overview

Grenada has one of the largest fishing fleets of the small eastern Caribbean island countries (Finlay 2000; Weidner et al. 2001). Although a significant segment of the national fishery remains semi-subsistence and small scale, the large majority of economical fishing effort and recorded fish catches are contributed by commercial operations (Weidner et al. 2001). Like many other Caribbean islands, Grenada is making the transition from a largely artisanal fishing industry to a small scale commercial industry. However, no large fishing companies own large fleets of vessels; most boats are privately or family owned (Weidner et al. 2001). In the early 1980s, Cubans introduced non-mechanized, artisanal longline techniques, which have since transformed into some larger longline operations. Until the introduction of longlining, Grenada's fisheries were primarily artisanal and coastal. Newer technologies have allowed and encouraged the expansion of fleet range to deeper waters, where many pelagic species can now be targeted year-round, rather than only when they are present in coastal waters.

As the longline fishery expands, vessels are employing longer lines, more hooks, and have extended fishing effort. This could have significant impacts on species typically caught in longline fisheries. Although reports indicate that swordfish catch is best from Oct-May, which only has limited overlap with turtle nesting season, the general longline expansion is of greater concern than just the swordfish fishery. The swordfish fishery is not common, though it is developing, but most sets are in the daytime and in deeper water, rather than in the upper water column at night.

There has been a general interest in developing FAD fisheries in the Caribbean, which could also lead to an increase in turtle bycatch.

Although Grenada's pelagic fisheries have not previously been heavily targeted due to a lack of gear and vessel capabilities, the increasing trend for fishers to operate in pelagic waters may have the potential to overexploit these species.

1. What fisheries exist in this territory and what are the target species?

There are many artisanal fisheries in Grenada. Artisanal fishermen recognize two distinct fishing seasons – the ocean pelagic season and the demersal bank/shelf season. The fish taken during the ocean pelagic season constitute over half of the country's entire catch (Weidner et al. 2001), and, particularly the migratory pelagics, are the most economically important fisheries (FAO 2000).

These species are notably tunas (including yellowfin, blackfin, skipjack, frigate, bullet and little tunny), mackerels, dolphinfish, kingfish, billfish (marlin and sailfish), wahoo and flyingfish (FAO 2000; Baldeo 2001). Some barracuda and swordfish (Baldeo 2001; Weidner et al. 2001) are also caught. These fisheries account for about 68 percent of total landings (FAO 2000). The pelagic fishery is expanding and it offers the most significant potential for expansion (Weidner et al. 2001).

The artisanal ocean pelagic fishery employs trolling to target yellowfin (*Thunnus albacares*) and blackfin tuna, kingfish, barracuda (Weidner et al. 2001) and dolphinfish. Fishermen operating around floating aggregating devices (FAD) catch yellowfin tuna, blackfin tuna, kingfish, dolphinfish, and other small tunas.

Most longline fishermen deploy pelagic longlines, but some artisanal longline fishermen sometimes set demersal longlines and target bottom fish such as snappers and groupers (Weidner et al. 2001). The pelagic longlines catch about 60% yellowfin tuna, and also catch billfish such as sailfish/ocean gar. Very little swordfish is caught in this fishery, which may reflect few nighttime sets when swordfish can be found in shallower waters. Longlines also catch sharks and treatment varies with the species. Makos are retained. Other sources differ in that some claim few sharks that are caught are landed, while others claim that sharks are often finned and the carcasses are discarded. Sharks are also caught as bycatch in set nets (Finlay 2000). The species caught by longlines and set nets include hammerheads, water sharks, nurse sharks, lemon sharks, and others (Finlay 2000).

During the **demersal bank/shelf fishing** season, the second distinct fishery for artisanal fishermen in Grenada, fishermen troll on their way to fishing grounds and target pelagics like wahoo, blackfin tuna, and dorado (dolphinfish, *Coryphaena hippurus*). Once at the fishing site, bank and shelf fishermen target demersals such as snappers, hinds, parrotfish and lobster.

Divers hand harvest multiple species, including conch (*Strombus gigas*), known locally as lambi, Caribbean spiny lobsters (*Panulirus argus*), green turtle (*Chelonia mydas*) (180lb/81kg*), leatherback (*Dermochelys coriacea*) (350lb/158kg*), hawksbill (*Eretmochelys imbricata*) (85lb/38kg*), loggerhead turtle (*Caretta caretta*) (160lb/72kg*), and topshell and other species of marine snails.

The inshore **beach seine fishery** accounts for approximately 15% of total landings/national fish production (FAO 2000; Finlay 2000), but can account for nearly a third of the annual catch (Weidner et al. 2001). Seine netters target multiple species,

* Minimum weights for sea turtles during the open season.

mainly juvenile coastal pelagics, but they also catch juvenile ocean pelagics or small adult coastal pelagics. They often supply longliners and other commercial fishermen with a variety of bait fish. Two carangids, *Selar* spp. and *Decapturus* spp. (scad species), account for the majority of the catch (90% according to FAO 2001), but small catches of blackfin tuna, horse eye jack, and rainbow runners are also taken (Weidner et al. 2001; Finlay 1996; FAO 2000).

Fish traps, which represent a small portion of fisheries, target serranids (groupers), lutjanids (snappers), carangids (jacks, pompanos, horse mackerels and scad), and a variety of other rockfish. Set nets are used to target lobsters. Many other fish are also caught in the nets, which are used primarily to bait the lobsters (Finlay 2000). However, much of this fish is bycatch and is wasted and unnecessary for catching lobsters (McConney 2003).

Groome (1970) in Finlay (2000) further provides a listing of economically important fish species with their local names. Annex 3 of the National Biodiversity Strategy and Action Plan (Finlay 2000) gives information on the current economic importance of fish catch by species. This information was obtained from the 1999 Fisheries Division database.

Please see Appendix 1 for a summary table of fisheries and target species.

2. What are the specific vessel and gear types used in each fishery?

The ocean pelagic species are targeted by artisanal, semi-industrial, and small-scale industrial fisheries that employ a number of different gear types. Gear descriptions are highly variable across reports. Some discrepancy arises from the longline industry, where reports do not necessarily describe what vessels they are considering longliners, sometimes mixing together small undecked pirogues and more substantial decked longliners (Weidner et al. 2001). Also, reports differ in how they describe the components of this fishery. Some define the fishery as a pelagic season (Weidner et al. 2001), some characterize pelagic fishery components based on vessel classifications (Baldeo 2001). Weidner et al. (2001) also mixes these presentation styles for the pelagic fishery.

Ocean pelagics are targeted by seines, encircling gear, gillnets, tangle nets, handlines and trolls, some FAD for flyingfish, and longliners (Weidner et al. 2001), and gear is set from open pirogues, sloops, and various categories of longliners (Baldeo 2001; Weidner et al. 2001). The **artisanal** ocean pelagic season uses seines, encircling gear, gillnets, tangle nets, handlines and trolls, some FAD for flyingfish (Weidner et al. 2001). **Trolling** uses two bamboo poles and 2-3 surface lines with artificial lures, natural or live bait, and the catch includes larger pelagics such as yellowfin and blackfin tuna, kingfish and barracuda (Weidner et al. 2001). Fishermen chum the waters while trolling to attract flyingfish for use as live bait. Some of these fishers operate from sloops out of Carriacou and spend a few days at sea, preserving the fish with ice and marketing much of the catch in Martinique (Weidner et al. 2001). Baldeo reports **trolling** from open pirogues (Category 4 vessels) that are 18-24 feet in length. He reports 215 boats, crewed by 2 men, with single 45- to 75-horsepower gasoline outboard engines. Fifty percent of this fleet carries VHF handheld radio, flares and life jackets.

The **artisanal longline fishery** primarily used pirogues in 1999 (Weidner et al. 2001). Weidner et al. found that some reports estimate over 200 pirogues in operation, while other industry reports suggest a much smaller number (about 40) active and employed in the longline fishery. Some pirogues use the basic longline fishing methods introduced by Cubans in the early 1980s, whereby lines were deployed by boxes (a simple, inexpensive method readily deployed from small craft such as pirogues). As of 2001, these vessels deploy lines of about 3-5 km with 100-150 hooks. Weidner et al. also reports that some vessels have small, hand-cranked, monofilament reels, but there are no mechanized reels. Artisanal longline fishermen mostly conduct day trips; they set their lines in the afternoon and retrieve them around 9-10 p.m. Few of these pirogues operate more than 50 km offshore, and they return after only one set because there are no ice holds on the boats. These fishermen report high operating costs from inefficiency of the outboard motors and fuel costs of only making one set per trip (Weidner et al. 2001).

Baldeo's (2001) category 1, small-scale open longline vessels targeting ocean pelagics are somewhat consistent with Weidner et al.'s artisanal longline description, but have a closer match to Weidner et al.'s description of the short-stay boats in the small-scale industrial longline fishery. Baldeo reports 75 small-scale open boats of 14-18 feet in length for this fishery, but he does not refer to them as pirogues, which is why I believe these are more like the Weidner et al.'s day boat category. The day boats described by Weidner et al. are 5-6 m in length. According to Baldeo, the target species from these small vessels are yellowfin tuna, dolphinfish, and billfish. Likewise, Weidner et al. report that tuna comprise most of the catch (over 60%), with billfish representing another main component (over 25%). Swordfish catch is limited. Baldeo reports light monofilament longline with up to 100 hooks, 1 manual mainline reel and 1 manual hook reel for these vessels.

Weidner et al. report about 30-40 mostly small decked longliners and about 30-40 larger undecked boats, not including pirogues rigged for longliners, with about 5-8 medium-sized longliners in Grenada. These medium sized longliners, with lengths ranging from 6-9 meters, appear consistent with Baldeo's category 2 medium-scale longliner vessels that are 26-32 feet with a forward cabin. Baldeo reports 30 active and 30 inactive boats in this fishery, with two 45- to 90-horsepower, gasoline outboard engines. These vessels have crews of three men. The gear they use is monofilament longline with up to 250 hooks, 1 manual reel, 1 manual hookline reel, and 1 manual buoyline reel; 90 percent of the fleet carries VHF base radio, GPS, life jackets, and flares (Baldeo 2001). These boats catch yellowfin tuna and billfish.

The FAO (2000) reports boats in between the category 1 and 2 boats that range from 18-32 feet and use 30- to 90-horsepower inboard engines.

Baldeo's category 3 vessels for targeting pelagics are large longliners, whose description is similar to Weidner et al.'s short-stay longline vessels. Baldeo reports 63 of these vessels, with single 70- to 350-horsepower diesel inboard engines. FAO (2000) also reports ocean pelagics being targeted by 34- to 45-foot boats using 70-350 inboard motors. Short-stay boats run 3-7 day trips, have ice storage on board, and make about 4 sets before returning to port. Baldeo reports the following gear: monofilament longline with up to 700 hooks, 1 hydraulic mainline reel (70% of fleet), 2 manual hookline reels, and 3 manual buoyline reels.

Weidner et al.'s gear descriptions are more variable. Fishermen are switching from Cuban to American style monofilament, and are trending towards longer lines and more hooks. Reports on line lengths vary, suggesting lines as short as 6 km, and up to 15-30 km for larger vessels. More recent reports indicate that short lines are becoming less common, and that lines of 8-12 km are more common. Some larger vessels are equipped with hydraulic reels. Similarly, reports on the number of hooks used varies from 8 km lines with 150 hooks, to 12 km lines with 500 hooks. Various ranges of set depths include 45-75 m, 10-60 m, 75-105 m, and 60-150 m.

Many boats have GPS navigational equipment, but do not have sophisticated electronics such as fish-finding sonar, or satellite imaging services to find fish. Grenadian fishermen are acquiring larger longline vessels, but the instrumentation remains largely artisanal in nature. According to Baldeo, 100% of the fleet carries GPS, VHF base radio, life jackets, and flares, and these boats target yellowfin tuna, and billfish (marlin, sailfish and swordfish).

Weidner et al. report very little swordfish, which may be explained by setting gear in the afternoon and retrieving it around 9-10 p.m. Fishermen have little desire to go out at night when swordfish can be caught above 70 meters. Sets must be made at 130 m in order to catch swordfish during the daytime. Yet, recent trends show an increase in swordfish catches and exports, which may reflect more evening sets. This could be a result of the short-stay boats that are able to set at night during their multiple-day trips, as well as a reflection of the increasing trend to fish in deeper, offshore waters.

Longline fishermen use a variety of bait, including flying fish, ballyhoo, bigeye scads and jacks. Squid are not commonly available, and light sticks are not used because of expense.

The FAO (2000) summarizes a small-scale commercial fishery as follows: 25 vessels of 35-45 feet (10.5-14 m) and 100 vessels of 18-30 feet (5.5-9.5m) to target yellowfin tuna, marlines, sailfish, dolphinfish, etc, by longlining 15-60 miles offshore. Approximately 25% of the remaining 400 vessels within the commercialized fishery target small tunas, dolphinfish, wahoo, juvenile yellowfin tuna, and other pelagics, within 10-15 miles offshore.

Pelagics are also caught by handline around FADs. A FAD fishery technology transfer occurred between Dominica and Grenada, where two sets of FAD were deployed off Granville in June 2005 (Guiste 2005). The Fisheries Division of Grenada requested this assistance, and the new gear was highly successful, allowing east coast fishermen to catch pelagics, such as yellowfin tuna, that are targeted by west coast fishers. In 2001, Baldeo reported approximately 20-30 fishing boats operating around two FADs about 200 m offshore of a fishing beach in Grenada. The FADs were two unused wooden fishing boats. These fishermen used mostly handlines and hooks with live bait to catch blackfin tuna and kingfish. Another FAD was anchored in 1200 feet of water on the east coast of Grenada.

During the **demersal bank/shelf fishing season**, fishermen mostly use hand hook-and-line gear, with bottom hand lines being the most common gear. They are deployed at depths of 20-200 meters. Some fishermen spear fish. Fishermen use boats from 4.5-6.0 m in length with reels deploying 30-50 hooks (Weidner et al. 2001). This fishery is targeted mainly by vessels less than 18 feet (5.5m). About 25-30% of demersals are exported and overall the fishery accounts for about 25% of the national landings (FAO

2000). All shellfish (also considered demersals) are subject to close seasons for 4 months of the year, and net mesh size restrictions are provided for both active and passive fishing gear.

The FAO (2000) reports 55 26-30 foot vessels in the inshore pelagic beach seine fishery. The beach seine nets are multimesh, single-ply encircling gill nets, commonly referred to by Grenadians as purse seines (Weidner et al. 2001). Finlay (1996) identified 41 large beach seines and 289 fishers, operating at 97 shallow water fishing sites along the coasts of Grenada and the Grenadines, who participated in a self-regulated Territorial Use Rights in Fisheries (TURF) system.

Caribbean spiny lobster has been targeted by free divers using loops, but now SCUBA is the normal method of harvest. Bycatch of lobsters in fish traps was also common, but according to McConney (2003), the use of fish traps has declined. However, illegal use of trammel nets still occurs, and has expanded the lobster fishery in places such as Sauteurs, on northern end of mainland Grenada. McConney gives the following description of the trammel nets used in Grenadian fisheries: A trammel net consists of three walls (panels) of webbing suspended from a float line and attached to a lead line. The bottom of the net is heavily leaded and the top of the net has floats, with a fly buoy to mark the position of the net on the surface. Some multimesh trammel nets are also set to hang in the water column, rather than anchored demersally.

The loosely hung central panel is of smaller mesh than the outer two. So, in addition to functioning as a gillnet, it entangles fish in the pockets formed as the central panel is pushed through either of the outer ones. It fishes passively at the bottom as an entangling net. Whereas a gillnet is fairly size selective, this entangling action is very unselective.

The trammel nets used in Sauteurs range from 100-150 m long and are approximately 1-1.5 m deep. In the first nets the two outer panels have a stretched mesh size of 4-6 inches, and the inner panel is 3 inches, and much wider than the outer panels so that it overlaps between the larger meshes of the outer panel. Fishers now claim to use 4-inch mesh on the inside and 12-inch outer panels that make entangling more effective. Another reason for the switch to the 4-inch inside mesh size was that fishers could buy more netting per dollar.

A small number of boats deploy 2-3 trammel nets each. Two fishers haul the nets, which is a difficult task given the weight of the nets as they snag on the bottom, catching coral, rocks, etc. McConney reports that the small (<7 m) outboard-powered wooden boats are scarred on the sides from pulling up nets loaded with bottom debris.

Table 1 shows the number of boats and nets for this fishery.

Table 1: Fishing effort for trammel nets targeting lobsters.
Table reproduced from McConney (2003).

	Sauteurs		Carriacou	
Year	Boats	Nets	Boats	Nets
1996	9	20	8	17
2001	9	20	5	15

Fish traps are constructed mainly out of small-mesh chicken wire, and are left to soak for days or weeks. They are one of the least visible gear types and are hard to control (Finlay 2000). Finlay estimates 1200-2000 traps used in demersal fisheries. However, Weidner et al. report little trap (pot) fishing in Grenada compared to many

other Caribbean fisheries. Similarly, the FAO (2000) attributes about 1% of total landings to part-time and subsistence fishermen using droplines and fish traps, and boats under 18 feet, to target serranids, lutjanids, carangids, and a variety of other rockfish. However, the low percentage does not necessarily discount the estimates of total number of traps given by Finlay, since other small-scale commercial operations likely land far more than the combined catch of multiple fish traps would be able to land.

Please see Appendix 2 for a summary table of fleet characteristics and fishing effort.

3. Where and when are the specific gear types deployed for each of these fisheries (seasonality, trip duration, etc)?

The artisanal ocean pelagic season typically runs from October/November until May/June, which is when yellowfin and blackfin tuna, kingfish and barracuda are caught via artisanal methods such as seining and trolling (Weidner et al. 2001). Surface longliners operating on the leeward side of Grenada to catch yellowfin tuna, billfish and flyingfish find these species to be prevalent between November and May (FAO 2000). The FAO fishery country profile reports that other pelagics that are caught by trolling along the windward shelf edge or slope are found year round, except for times in November and December.

Artisanal longline fishermen conduct mostly day trips, setting lines in the afternoon and retrieving them around 9-10 p.m., with few pirogues operating more than about 50 km offshore (Weidner et al. 2001). Baldeo reports that category 4 open pirogues used for trolling operate 5-40 miles offshore, with day trips leaving at 4 a.m. and returning 11-12 a.m.

Baldeo reports fishers operating category 1 small-scale open longliners (which may be similar to Weidner's artisanal longline fishermen) leaving between 6-7 a.m. and returning 4-7 p.m. and operating between 1-10 miles from land.

Category 2 boats operate 5-30 miles west of Grenada, and run single day trips from 6-8 a.m. until 7-11 p.m. The small-scale industrial day boats described by Weidner operate within 30-130 kilometers from land. Without ice holds, these vessels return with their catch after one set. Category 3 large longliners operate 25-80 miles west and northwest of Grenada, with 4- to 7-day trips.

The FAO (2000) reports small-scale commercial fisheries operating longliners about 15-60 miles offshore to target large pelagics, with vessels targeting smaller pelagics operating within 10-15 miles off shore.

Other surface and line fishing is conducted on the western coast, beyond the shelf slope. Some FAD are deployed off of Granville, one about 200 m off of another fishing beach, and another in 1200 feet of water on the east coast.

As the pelagic season trails off in May/June, fishermen along the eastern coast shift to **demersal** reef species (mostly snappers hinds, parrotfish and lobster), mostly on the slope of the shelf surrounding the islands. This "bottom season" typically runs from July-November. Many fishermen along the western coast suspend operations during this period.

The most popular demersal fishing ground is north of Grenada, and is overexploited, but diversion of effort from demersals to pelagic fisheries has relieved some of this pressure on demersal resources (FAO 2000).

Turtles and conch are also harvested as demersal species. The turtle season is closed from March 1- July 31, during the height of the nesting season. The hand harvest fishery operates along the southern and southeastern coasts of Grenada, likely in reef zones to harvest turtles, and other various crustaceans and shellfish.

The inshore **beach seine fishery** is conducted in shallow coves and bays along the western, leeward coastline (Weidner et al. 2001; FAO 2000) of Grenada and typically not far from the fishers' residence (Finlay 1996). This fishery occurs year-round with relatively constant effort, but landings peak in July-August.

The trammel-net lobster fishery operates on the northern shelf of Grenada and extends to the island of Carriacou. The concentration of this gear is shown in Figure 5.4 in McConney 2003. Nets are set in channels in 20-80 meters of water where there are strong currents. Nets soak for 18-24 hours, are retrieved and set again the next day for an average of 5 days per week. They may soak unattended on weekends during the open season for lobster (from September 1 to April 30). Nets are left to soak longer towards the end of the lobster-fishing season if catches are low. Table 2 shows the seasonality of fishing at Sauteurs.

Between 6-10 boats are usually operating, and boats catch 30-60 kg of lobster per week in a season of 16-24 weeks. Thus, landings of about 20 metric tons per season of whole lobster from Sauteurs and Isle de Ronde are possible.

Table 2: Seasonality for various fisheries in Sauteurs. Table is reproduced from McConney 2003.

Type of Fishing	J	F	M	A	M	J	J	A	S	O	N	D
Lobster (diving and illegal nets)	■	■	■						■	■	■	■
Finfish Diving (SCUBA mainly)	■	■	■	■	■	■	■	■	■	■	■	■
Beach Seine (sometimes offshore)	■	■	■	■	■	■	■	■	■	■	■	■
Handline (vertical multi-hook line)			■	■	■	■	■	■	■			
Palangue (bottom longline)			■	■	■	■	■	■				

4. What species of marine mammals, sea turtles and seabirds occur and may be at risk for capture or interaction with fisheries?

Marine Mammals:

Romero and Hayford (2000) conducted field and archival studies in Grenada, and found no evidence of current or recent intentional or accidental capture of marine mammals by Grenadian fishermen, although hunting marine mammals did occur in pre-Columbian times. Through their interviews, they found that many fishermen had difficulty identifying pictures of whales and dolphins. There are two whale-watching operations – one in Grenada and one in Carriacou. Species reported around Grenada are dolphins and pilot, humpback, sperm, beaked, false killer and Bryde's whales. No assessment of fishery interactions was found for the Weidner et al. report.

A comprehensive list of marine mammals that have ranges which include the waters of Grenada, and which may be found there, can be found in Appendix 4.

Sea Turtles:

There is a season and size limit on turtles, but enforcement of regulations is weak. There is little information available on fishery interactions with turtles. Weidner et al. (2001) knew of no study assessing turtle catches in the longline fishery when writing their report. Some say loggerheads are regularly taken, and observers on U.S. longliners operating in the Caribbean indicate that loggerheads and leatherbacks are the turtle species most affected by longlining. If longline catch is poor, fishers may be more likely to retain turtles. Fleets that operate closer to shore may experience greater bycatch, and if bycatch occurs, it is likely that fishers almost certainly retain turtle bycatch rather than attempting to return them live as do many U.S. fishermen. Grenadian officials report that longlines take few turtles, but other sources say there is no data available on the longline fishery to support either argument.

In McConney's 2003 case study of the lobster fishery at Sauteurs, he reports bycatch in trammel nets used for lobster fisheries. Net contents have not been systematically recorded, and my fishermen are reluctant to admit the amount of habitat damage that is caused by trammel nets, or the high amount of fisheries resources that are wasted. Fisheries officers report that a lot of the discards are not economically important or fit for human consumption. There is a lot of discard of corals and sponges, so habitat destruction is likely significant. Turtles, sharks and rays are also reported as killed (McConney 2003), but there are no further details.

Sea Birds:

Grenada and the Grenadines appear to provide some significant nesting grounds for seabirds, or have done so in the past. Historically, the Audobon's Shearwater (*Puffinis lherminieri*) bred on Grenada. Though there are still nesters in Barbados, there are only 100 pairs, and the nesting population in Grenada is believed to be extirpated (Lee 2000). Audobon's Shearwater is reported as good eating, and has been targeted as food in many places in the Caribbean, such as the Netherlands Antilles, (Lee 2000) so it is possible that this has happened to Grenadian populations.

The Laughing gull (*Larus atricilla*) is reported to breed on Grenada, but there is no data on the number of nesting pairs. These species do not appear to be experiencing any particular problems in the West Indies, but like other seabirds in this region, they or their eggs may be targeted for human consumption (Chardine et al. 2000).

Roseate Terns (*Sterna dougallii*) prefer and breed on small offshore islands, marine rocks, cays and islets, of which there are plenty in the Grenadines. Colonies have been reported in Grenada and the Grenadines, but like Roseate Tern populations throughout the Caribbean, little is known about population sizes and locations of colonies (Saliva 2000).

Grenada and the Grenadines supposedly support significant rookeries for boobies at "Gwizo" (near Isle De Ronde), Les Tantes and "Upper Rock" with some at "Le Rock" (Finlay 2000). Finlay does not discuss which booby species are present, but Schreiber

(2000) reports the Red-footed Bobby (*Sula sula*), the Brown Booby (*S. leucogaster*) and the Masked Booby (*S. dactylatra*). Fishermen and poachers target young (fat-chested) boobies and ramier (*Columba squamosa*) for food. While Finlay (2000) reports that populations have remained vibrant over the years, Schreiber (2000) reports differently. In the 2-3 sites in Grenada where red-footed boobies have been reported to breed in the past, populations are now extirpated, though 100+ breeding pairs have been reported for Kick-em-Jenny Key. Elsewhere in the Grenadines (such as Battowia Bullet and All-awash Islet), a questionable few pairs are reported, but there is no recent data. Brown boobies have been reported as extirpated for all of these locations (Schreiber 2000), although individual brown boobies are found in Carriacou (personal observation 2004). For Battowia Bullet and Kick-em-Jenny Key, a few breeding pairs of masked boobies have historically been recorded, but there are no recent data.

Finlay (2000) reports significant numbers of Frigatebirds (“Scissors-tail”) found at Sandy and Green Islands. However, while their wide ranging habitats make them seem ubiquitous around the Caribbean, Lindsey et al. (2000) reports that the Magnificent Frigatebird is probably one of the most threatened seabird species in the Caribbean, with possibly fewer than 4300-5300 breeding pairs, and with 75-80% of these in five main colonies. They used to breed in Grenada and the Grenadines, and perhaps still do, but there is no recent data. However, individuals may still be observed (personal observation 2004).

There is no known assessment of seabird interactions with fisheries in Grenada but given the presence of many species, it is possible that these interactions occur but simply have not been studied.

Devas (1954) lists a number of important sea birds species of Grenada and the Grenadines, and can be found in Annex 5 of the National Biodiversity Strategy and Action Plan (Finlay 2000). However, I am unable to find Annex 5 of this report. Also, given Schreiber and Lee’s 2000 compilation of West Indian seabird conservation status, it is likely that the 1954 publication is outdated, and would contain species that have since been extirpated. But the resource may still be valuable for historical reference to examine seabird decline over the latter half of the century.

5. What collection methods (observer programs, etc.) exist for gathering fishing effort and bycatch data for each fishery?

Around 1988, the Organization of Eastern Caribbean States (OECS) hosted a workshop to improve data collection systems for member countries. A plan developed by Finlay et al. (1988) included “a total census at major markets, a sampling program for other sites, collection of purchase slips from hotels and restaurants (for lobster, conch and choice fish), review of export licenses, implementation of a logbook system for launches, recreational and charter boats and procedures for estimating foreign catches” (Mohammed and Rennie 2003). However, financial and human resources constraints have impeded the implementation of this plan. These same constraints impeded an observer program that, as part of an ICCAT system, intended to collect fishing data from foreign fishing vessels under joint venture arrangements with local investors (Mohammed and Rennie 2003).

Currently, fisheries data is collected from samples from the six fish markets at major landing areas (Baldeo 2001). These landing sites are ranked by percentage catch, and are as follows: St. George's (25%), Gouyave (25%), Grenville (20%), Petite Martinique (15%), with minor sites at Victoria/Duquesne (<2%), Isle de Ronde (<2%), Sauteurs (2%), Calliste (1%), L'Esterre (<0.5%) and others (~8%) (FAO 2000). These markets are staffed with government-paid employees, and all the fish passing through the market system is recorded. However, there are gaps in catch data because of inconsistent coverage of landing sites from year to year (Mohammed and Rennie 2003), and fish that does not go to these markets, such as fish caught by subsistence fishermen, is not recorded (Baldeo 2001).

Data coverage varies for different fisheries. The deep-sea large pelagics (which attain the highest market prices) and coastal small pelagic fisheries have the highest coverage (~80%) (Baldeo 2001). The demersal fishery has about 70% coverage, the inshore pelagic 60%, and the shellfish approximately 25% coverage. There are plans to institute a more structured sampling plan to arrive at a more accurate estimate of total landing.

Catch by species by boat is collected on a daily basis by the Fisheries Division, especially for commercially important species. The more commercially important species are recorded as catch per individual species, whereas the less commercially important catches are recorded as species groups (Finlay 2000).

Effort is also collected as a total sample similar to landings data. Effort is measured in boat-days due to the multiple gear types used in the multi-species fishery (Baldeo 2001).

In 1995, ICCAT initiated efforts to collect information on shark bycatches associated in fisheries for tuna and related species. In 1995, 7 tons of shark bycatch was reported, but it is not certain whether this is total catch or just landed fish (Weidner et al. 2001).

Bycatch, consisting of billfish, dolphinfish, kingfish and wahoo, are sold to vendors at the markets, so these quantities are also recorded (Mohammed and Rennie 2003).

6. Are there databases or datasets (including geospatial databases) on fisheries, fishing effort or bycatch of marine mammals, sea turtles, or seabirds?

The Fisheries Division of the Ministry of Agriculture (MOA-FD) maintains a database of catch records. An example of these records can be found in Annex 3 of Finlay (2000). The species recorded are categorized into pelagic finfish, demersal finfish, crustaceans and shellfish, and unclassified fish (mainly demersals).

There is a GIS database for The Grenadines (St. Vincent and Grenada, from Bequia to Carriacou). The MRSIS – Grenadines Marine Space Use Information System – is maintained by the University of West Indies under Kim Baldwin, Dr. Hazel Oxenford, and Dr. Robin Mahon. The following is a description of the database given on the website:

Marine resources (including fishing and marine-based tourism) are of vital importance to the people of the Grenadine islands. A greater understanding of the abundance and distribution of key marine resources, marine resource users and the patterns of use is critical for planning in relation to the sustainable use, development and conservation of these resources. By integrating social, economic and environmental information into a single framework - Grenadines MarSIS; effective marine resource management and sustainability of livelihoods is emphasised and the anticipation, resolution or accommodation of user conflicts is possible. Furthermore, marine space use management allows for a participatory framework and

equity in decision making by meaningfully including and considering all sectoral, NGO and community interests.

7. *What bycatch studies or bycatch mitigation projects exist for marine mammals, sea turtles, or seabirds?*

Weidner et al. report no known Grenadian study assessing fisheries bycatch or interactions with non-fishery species like sea turtles, marine mammals, and seabirds.

8. *Are there bycatch research and mitigation projects for other taxa, such as non-target fish or shark species?*

I found no information on explicit bycatch mitigation projects. However, McConney (2003) does discuss the awareness and concern over the high amounts of discards and habitat destruction associated with trammel nets. Although they are illegal, they are still used and still pose a threat to marine resources. Discussions between fishers and fisheries officers has led to experimentation with alternative gear types, such as lobster pots, traps and single-panel nets (i.e. gillnets). However, fishers are resistant for the most part to the use of new gear, and seem convinced that new methods will not work well. Another issue of concern is the high bycatch associated with gillnets, but this may be a less damaging fishing method compared to the use of trammel nets. However, overall data regarding bycatch is sketchy as fishers do not want to admit that the trammel nets are damaging the environment and do not report their incidental catch.

Weidner et al. report that much of the foreign billfish catch is incidental to tuna and swordfish operations. However, billfish are also a target for Grenadian fishermen, and if caught incidentally in another fishery, it is sold at markets. Thus, there is catch data, but there is no effort to mitigate this catch since the species caught are also desired by fishermen.

Weidner et al. report that limited observer coverage and bycatch data may exist, such as for foreign longliners that operate in the Caribbean. However, Grenada's fisheries research has been minor and has hardly addressed targeted fisheries, let alone fisheries bycatch.

9. *What policy/regulatory framework exists to guide fisheries or bycatch management?*

Marine resource management is the responsibility of the Fisheries Division, under the Ministry of Agriculture, Lands, Forestry and Fisheries, and the FD is administered by a Chief Fisheries Officer. Table 4 provides a summary list of marine-relevant treaties and conventions which are relevant to fisheries and bycatch issues.

Table 3: Treaties and conventions to which Grenada is a member that pertain to marine conservation issues (Sea Around Us).

Short Title	Long Title
CARICOM	Caribbean Community

Cartagena de Indias	Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
Lome IV	Fourth ACP - EEC Convention
IPPC	International Plant Protection Convention
IWC	International Whaling Commission
MP	Montreal Protocol for the Protection of the Ozone Layer
OECS	Organization of Eastern Caribbean States
UNCLOS	United Nations Convention on the Law of the Sea
UNFCCC	United Nations Framework Convention on Climate Change
WECAFC	Western Central Atlantic Fishery Commission

In 1988, UNCLOS generated the Territorial Waters Act and the Marine Boundaries Act. This was later consolidated and updated into the Grenada Territorial and Marine Boundaries Act #25 of 1989. In 1986, the Grenada Fisheries Act #15 was passed and regulations SRO #9, 1987, became part of the OECS Harmonized Laws. Other fisheries legislation include Fishing Vessel Safety Regulations (1990), Fisheries Regulations #24 (1996) and Fisheries (amendment) Act (1999). The Fisheries Act and Regulations makes provisions for local as well as foreign fishing operations, marine reserves and conservation measures, regional cooperation in fisheries, and other fisheries management and development measures.

10. Have research and management needs, priorities or constraints been identified or recommended? (include gear/technological developments or prohibitions that might impact fisheries).

According to the second National Report on the Convention on Biological Diversity, when asked what the relative priority for implementation of a work program in marine and coastal biological diversity in Grenada is, it was ranked “high”. When asked to what extent the resources (human and financial) available are adequate for meeting the obligations and recommendations made, the response was “limiting.”

There is concern over the destructive nature of some gear types, such as trammel nets, but I found no mention of efforts to solve this problem or of constraints that interfere with mitigation efforts.

11. Fishing Effort Contacts: If there are other individuals in relevant government agencies or non-governmental organizations that may be able to assist us with information on fisheries, please provide their names and contact details below:

Crafton J. Isaac
 Fisheries Officer II
 Fisheries Division
 Ministry of Agriculture, Lands,
 Forestry and Fisheries
 Ministerial Complex
 Botanical Gardens

St. Georges, Grenada
Tel: (473) 440-3831
Fax: (473) 440-6613
crafton.isaac@gmail.com

Paul Phillip
Chief Fisheries Officer
Fisheries Division,
Ministry of Agriculture, Forestry, Lands and Fisheries
Ministerial Complex, Botanical Gardens
St. Georges, Grenada
Tel: 473-440-3814
Fax: 473-440-6613
grenfish@caribsurf.com

Justin Rennie
Chief Fisheries Officer
Fisheries Division
Ministry of Agriculture, Forestry, Lands and Fisheries
Ministerial Complex, Botanical Gardens
St. Georges, Grenada, West Indies
Tel: 473-440-3814/3831
Fax: 473-440-6613
fisheries@gov.gd

12. Bycatch Contacts: If there are other individuals in relevant government agencies or non-governmental organizations that may be able to assist us with information on bycatch of sea turtles, sea birds and marine mammals, please provide their names and contact details below:

Dr. Linus Spencer Thomas
Cartagena Protocol Primary NFP
National Biodiversity Coordinator
c/o Ministry of Finance and Planning
Financial Complex, The Carenage
St. George's, Grenada
Tel: 1-473-440-9701; 1-473-407-5765
Fax: 1-473-440-4115; 1-473-440-0207
Email: sthomas@ectel.int or Spence105@hotmail.com

Becky King and Carl Lloyd
Directors, Ocean Spirits
P. O. Box 1373
Grand Anse
St. George's, Grenada
Tel: (473) 442-0399

carl@oceanspirits.org
becky@oceanspirits.org
(sea turtle monitoring program)

Marina Fastigi
Director KIDO Ecological Research Station
Prospect, Carriacou
Grenada, West Indies
Tel: 473-443-7936
kido-ywf@spiceisle.com
(sea turtle monitoring program)

13. Documents: What documents (journal articles, grey literature, agency reports) describe fisheries and bycatch in this area?

Literature Cited:

Baldeo, R.A. 2001. National Report of Grenada. *In* National reports and technical papers presented at the First Meeting of the WECAFC Ad Hoc Working Group on the Development of Sustainable Moored Fish Aggregating Device Fishing in the Lesser Antilles. FAO Fisheries Report No. 683, Supplement. ISSN 0429-9337. Le Robert, Martinique, 8-11 October 2001.

Chardine, J.W., Morris, R.D., Parnell, J.F. and Pierce, J. 2000. Status and Conservation Priorities for Laughing Gulls, Gull-billed Terns, Royal Terns and Bridled Terns in the West Indies. *In* Status and Conservation of West Indian Seabirds, E.A. Schreiber and D.S. Lee (Eds.) Society of Caribbean Ornithology, Special Publication No. 1, v + 223 pp.

FAO. 2000. Fishery Country Profile – Grenada. January 2000.
<<http://www.fao.org/fi/fcp/en/GRD/profile.htm>>
<<http://www.fao.org/fi/fcp/en/GRD/body.htm>>

Finlay J. 1996. Community-level sea use management in the Grenada beach seine fishery: current practices and management recommendations. M.Sc. Thesis, University of the West Indies, Cave Hill, Barbados.

Finlay, J., Rennie, J., Mahon, R. and Rosenberg, A.A. 1988. A fishery data collection system for Grenada. Fishery data collection systems for eastern Caribbean islands: Proceedings of an OECS/ICOD Workshop. The Organization of the Eastern Caribbean States, Fisher Unit, Can Garden, St. Vincent and the Grenadines.

Finlay, J. 2000. Grenada: National Biodiversity Strategy and Action Plan: Assessment and Analysis of Fisheries Marine and Coastal Areas, Consultants Report. United Nations Development Programme; Global Environmental Facility. Project No.: GRN/98/G31/A/1G/99

Guiste, H. 2005. Dominica Shares Fish Aggregating Device Technology (FAD) with Grenada in CRFM News: The Biannual Newsletter of the Caribbean Regional Fisheries Mechanism. Issue No. 4, December 2005.

Lee, D.S. 2000. Status and Conservation Priorities for Audobon's Shearwaters in the West Indies. *In* Status and Conservation of West Indian Seabirds, E.A. Schreiber and D.S. Lee (Eds.) Society of Caribbean Ornithology, Special Publication No. 1, v + 223 pp.

Lindsey, K., Horwith, B., and Schreiber, E.A. 2000. Status of the Magnificent Frigatebird in the West Indies. *In* Status and Conservation of West Indian Seabirds, E.A. Schreiber and D.S. Lee (Eds.) Society of Caribbean Ornithology, Special Publication No. 1, v + 223 pp.

McConney, P. 2003. Grenada case study: the lobster fishery at Sauteurs. Caribbean Coastal Co-management Guidelines Project. Caribbean Conservation Association, Barbados. 65pp.

Mohammed, E. and Rennie, J. 2003. Grenada and the Grenadines: Reconstructed Fisheries Catches and Fishing Effort, 1942-2001. *In* From Mexico to Brazil: Central Atlantic fisheries catch trends and ecosystem models. Fisheries Center Research Reports 11(6), 264 pp. University British Columbia, Vancouver, Canada.

Romero, A. & K. Hayford. 2000. Past and present utilization of marine mammals in Grenada, W.I. *Journal of Cetacean Research and Management* 2(3):223-226.

Saliva, J.E. 2000. Conservation Priorities for Roseate Terns in the West Indies. *In* Status and Conservation of West Indian Seabirds, E.A. Schreiber and D.S. Lee (Eds.) Society of Caribbean Ornithology, Special Publication No. 1, v + 223 pp.

Schreiber, E.A. Status of Red-footed, Brown and Masked Boobies in the West Indies. *In* Status and Conservation of West Indian Seabirds, E.A. Schreiber and D.S. Lee (Eds.) Society of Caribbean Ornithology, Special Publication No. 1, v + 223 pp.

Weidner, D.M., Laya, G.E. and Folsom, W.B. November 2001. An Analysis of Swordfish Fisheries, Market Trends, and Trade Patterns, Past-Present-Future. Volume IV: Latin America, Part B: Caribbean, Section 3: Dominica to Martinique. Prepared by The Office of Science and Technology.

Other Relevant Sources of Information:

CFRAMP 2001. Report of the 2000 Caribbean Pelagic and Reef Fisheries Assessment and Management Workshop. ISBN 876-8165-12-x

Yuri Sanjeev Chakalall, Robin Mahon, Hazel Oxenford and Raymond Ryan.
Fish Exporting in the Grenadines Islands: Activities of Trading Vessels and Supplying Fishers.

No. 14

Charmaine Gomez, Robin Mahon, Susan Singh-Renton and Wayne Hunte.
The Role of Drifting Objects in Pelagics Fisheries in the Southeastern Caribbean. January 1994

ECNAMP and CCA (1980): Grenada Preliminary Data Atlas Survey of Conservation Priorities in the Lesser Antilles (CCA, UNEP)

Finlay J. "Rights Based Fishing in the Beach Seine Fishery of St. Vincent & the Grenadines, St. Lucia and Dominica", Fisheries Division, Grenada, West Indies, July 1993.

Grant, Sandra. PhD candidate (Advisor: F. Berkes). Managing small-scale fisheries in the Caribbean: case of Gouyave longline fishermen, Grenada. University of Manitoba, Natural Resources Institute.

Grant, S. 2004. One hand can't clap: Combining scientific and Local Knowledge for Improved Caribbean Fisheries Management.

Mahon, R., Rennie, J., Ryan, R. and Singh-Renton, S. 1994. Billfish catch and effort data from Barbados, Grenada, St. Lucia and St. Vincent and the Grenadines. ICCAT Coll. Vol. Sci. Pap. 41: 431-441.

Samlalsingh, S., Oxenford., H.A. and Rennie, J. 1999. A successful small-scale longline fishery in Grenada. Proc. Gulf Carib. Fish. Inst. 46: 3-21.

Singh-Renton, S. and Mahon, R. May 1996. Catch, Effort and CPUE Trends for Offshore Pelagic Fisheries in and adjacent to the exclusive economic zones (EEZs) of Several CARICOM Countries.

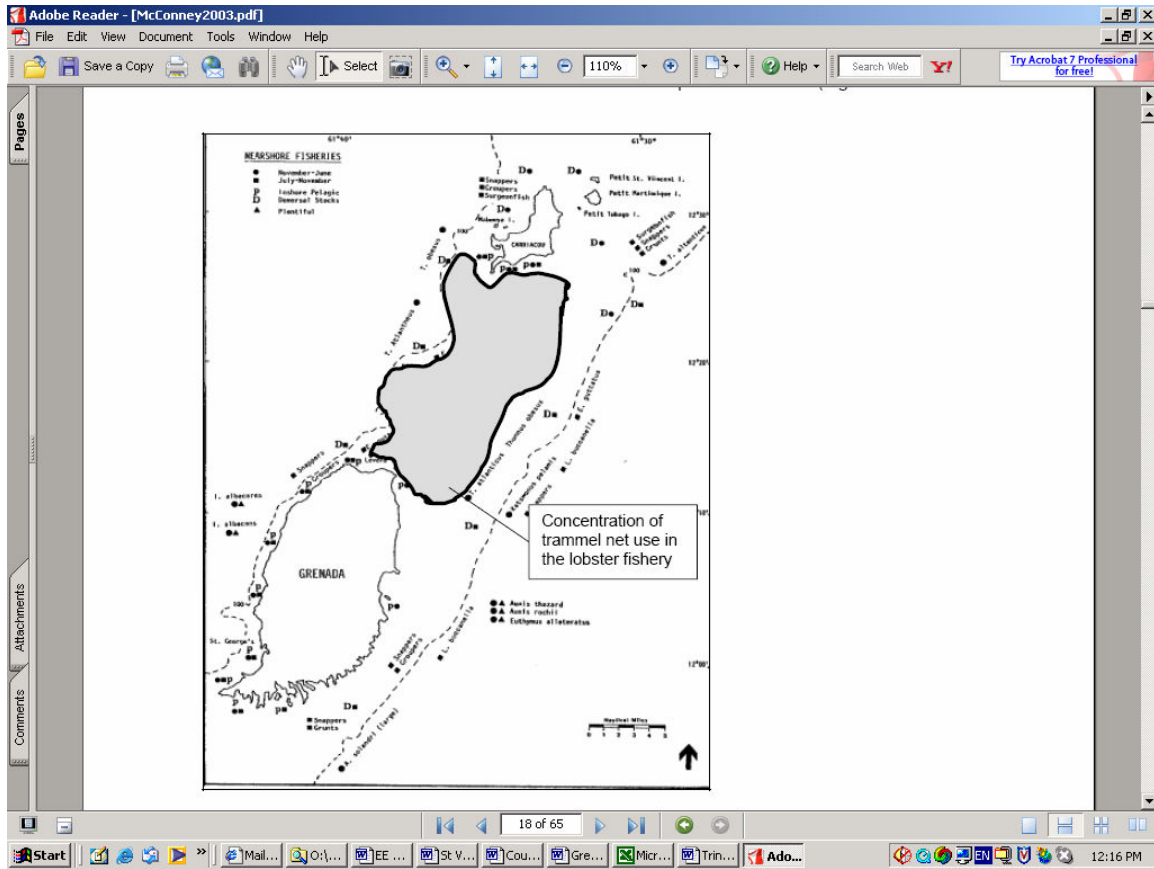
Appendix 2: Summary table of fleet characteristics and fishing effort for longlines and gillnets, the gear types of major concern for bycatch. Note: trawls are the third gear type of concern but there are no trawlers in Grenada.

	Gear type →	Longline	Longline	Longline	Gillnet*	Gillnet*
	Artisanal/Industrial/Undetermined	Artisanal	Semi-industrial	Industrial	Artisanal - Trammel	Artisanal – beach seine
Fleet Characteristics	Target species	Yellowfin tuna, dolphinfish, billfish	Yellowfin tuna, billfish (marlin and sailfish)	Yellowfin tuna, billfish (marlin and sailfish)	lobster	Coastal pelagic species
	Vessel type	Pirogues, sloops and others	Small decked or larger undecked longliners		Small wooden boats	
	Vessel Classification (country specific)	Category I – small scale open longliner	Category II – medium scale longliner	Category III – large longliners		
	Vessel length (m)	14-18 ft	26-32 ft	34-60 ft	< 7 m	26-30 ft
	Number of vessels	75	30 active, 30 inactive	63	14	55
	Engine type	Single gasoline outboard	2 gasoline outboard	Single diesel inboard engine	Outboard engine	
	Avg Horsepower	15-25	45-90	35-70		
	Gear Used (materials)	Light monofilament; 1 manual mainline reel; 1 manual hookline reel	Monofilament longline; 1 manual mainline reel; 1 manual hookline reel; 1 manual buoyline reel	Monofilament longline; hydraulic mainline reel; 2 manual hookline reels; 3 manual buoyline reels	35 nets used total	Multimesh single ply encircling gillnets
	How gear deployed (demersal/pelagic, set/drift)	Pelagic	Pelagic	Pelagic	Demersal	Coastal pelagic
Effort	Crew Size	2 men	3	4	At least 2	289 total fishers
	Where gear deployed/ area fished	1-10 miles from land	5-30 miles offshore, west of Grenada	25-80 miles west of Grenada	Sauteurs and Carriacou	97 shallow water sites around Grenada and Grenadines
	Fishing seasons (months)	Oct/Nov – May/June	Oct/Nov – May/June		Sept - March	Year round
	Avg. trip duration (days)	Day trip 6-7 am – 4-7 pm	Day trip 6-8 am – 7-11 pm	4-7 day trip		
	Total days fished per month/year					
	Number of fishing trips per year					
	Gear/vessel effort (gear & trip information)	Hook size/type: Number of hooks: up to 100 Main line length:	Hook size/type: Number of hooks: up to 250 Main line length:	Hook size/type: Number of hooks: up to 700 Main line length:	Net mesh size(s): 4-6 in. outer panels; 3 in. inner panels Twine gauge: Weight: Mesh length: Weight: Mesh length: Net length & width: 100 -150 m long	Net mesh size(s): Twine gauge: Weight: Mesh length: Net length & width: Net Depth:

					Net Depth: 1-1.5 m deep	
	Number of sets/hauls/soaks/tows per trip					
	Number of hours per set/soak/tow					
	= Total number of hours towed per trip					

* Trammel nets and beach seines are described as gillnets either in their function or materials, but no other gillnet fisheries are described for Grenada. Therefore, I included these gear types under the gillnet description.

Appendix 3: Figure 5.4 from McConney 2003 that shows the area north of Grenada and south of Carriacou where the trammel net lobster fishery is concentrated.



Appendix 4: Marine mammal distributions around Grenada as given by Sea Around Us, and those identified in the Romero and Hayford (2000)

Sea Around Us Project		Romero and Hayford (2000)	
Scientific Name	Scientific Name	Common Name	Scientific Name
<i>Balaenoptera acutorostrata</i>	Dwarf minke whale	<i>Balaenoptera brydei</i>	Brydes whale
<i>Balaenoptera borealis</i>	Sei whale	<i>Kogia</i> spp.	Sperm whale
<i>Balaenoptera brydei</i>	Brydes whale	<i>Megaptera novaeangliae</i>	Humpback whale
<i>Balaenoptera musculus</i>	Blue whale	<i>Mesoplodon</i> spp. or <i>Ziphius</i> spp.	Beaked whale
<i>Balaenoptera physalus</i>	Fin whale	<i>Pseudorca crassidens</i>	False killer whale
<i>Delphinus delphis</i>	Short beaked common dolphin	<i>Globicephala macrorhynchus</i>	Short-finned pilot whale
<i>Eubalaena glacialis</i>	North Atlantic right whale	?	dolphin species
<i>Feresa attenuata</i>	Pygmy killer whale		
<i>Globicephala macrorhynchus</i>	Short-finned pilot whale		
<i>Grampus griseus</i>	Rissos dolphin		
<i>Halichoerus grypus</i>	Gray seal		
<i>Kogia breviceps</i>	Pygmy sperm whale		
<i>Kogia simus</i>	Dwarf sperm whale		
<i>Lagenodelphis hosei</i>	Fraser's dolphin		
<i>Megaptera novaeangliae</i>	Humpback whale		

Mesoplodon densirostris	Blainvilles beaked whale
Mesoplodon europaeus	Gervais beaked whale
Mesoplodon mirus	Trues beaked whale
Peponocephala electra	Melon-headed whale
Physeter macrocephalus	Sperm whale
Pseudorca crassidens	False killer whale
Stenella attenuata	Pantropical spotted dolphin
Stenella clymene	Clymene dolphin
Stenella coeruleoalba	Striped dolphin
Stenella frontalis	Atlantic spotted dolphin
Stenella longirostris	Spinner dolphin
Steno bredanensis	Rough-toothed dolphin
Tursiops truncatus	Bottlenose dolphin
Ziphius cavirostris	Cuiviers beaked whale