

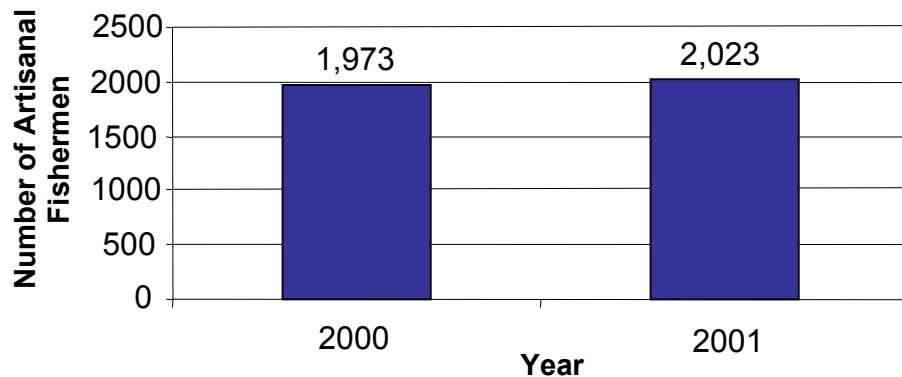
Coral Reef Fisheries Uses In Puerto Rico and USVI

ARTISANAL FISHING

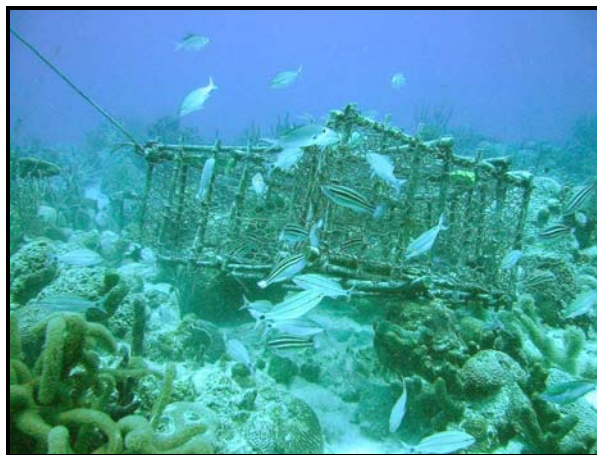
Artisanal fishing refers to small scale commercial fishing in the Caribbean. Fishing boats often range from 15 – 30 feet long, and the most commonly used gear includes fish traps (also known as pot fishing), hand nets, hand line, rod and reel, and spear fishing. All artisanal fishermen in Puerto Rico and USVI are required to purchase fishing licenses.

Puerto Rico

Number of Artisanal Fishermen in Puerto Rico for 2000 and 2001



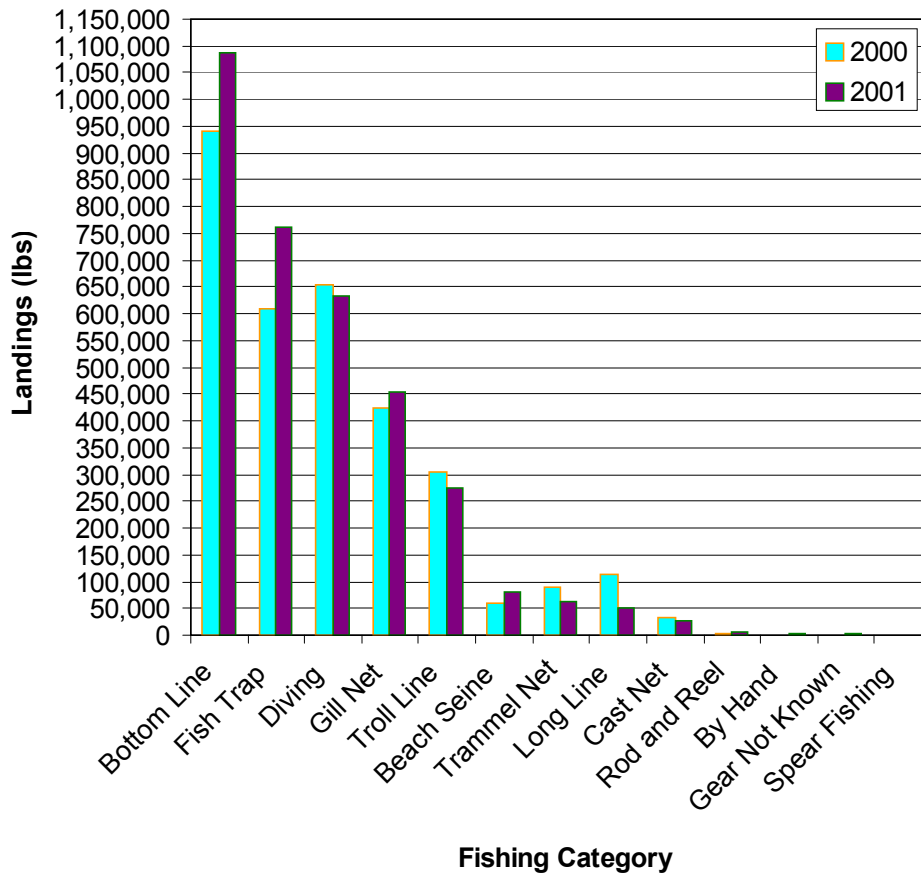
In 2000, 1,973 fishermen were registered for a commercial fishing license, and the number grew to 2,023 in 2001.¹



Fish Trap. Photo courtesy of Ron Hill.

¹ Source: NOAA Southeast Fishery Science Center.

Reported Commercial Landings by Fishing Category in Puerto Rico for 2000 and 2001



The bottom line fishery is by far the most popular and has the greatest impact on fish populations in the Caribbean coral reefs, followed by fish trap fisheries. Hand and spear fishing catch the least amount of fish at a time.

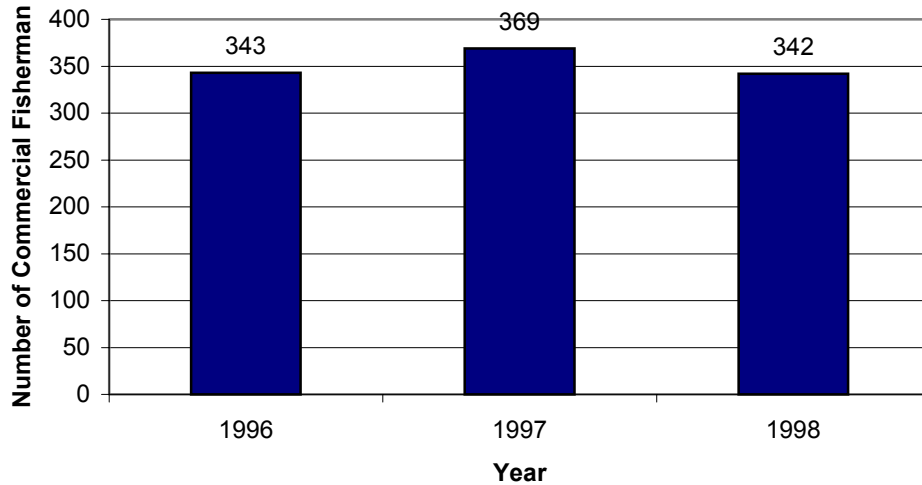
Total landings for all commercial fishing categories listed in Puerto Rico were 3,234,010 lbs and 3,442,588 lbs for 2000 and 2001 respectively. The data for 2001 is preliminary.



Fish inside of a fish trap. Photo courtesy of Ron Hill.

US Virgin Islands

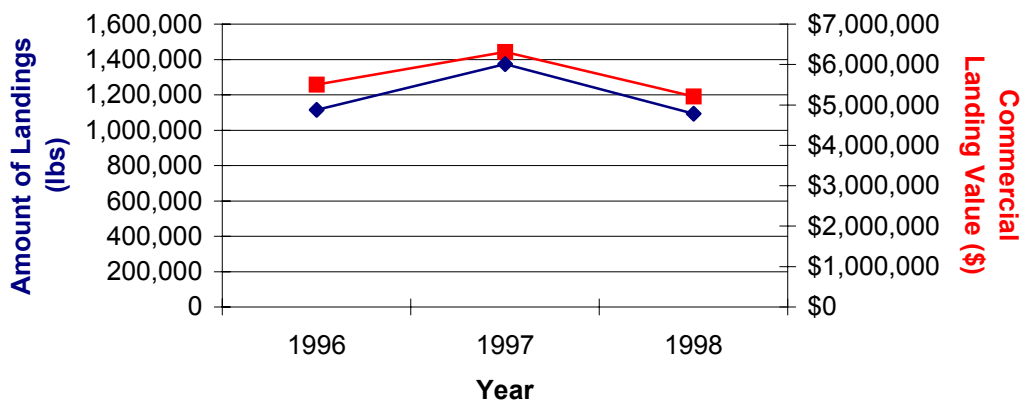
Number of Commercial Fisherman in USVI



Based on the most recent information available, the number of fishermen registered with commercial fishing licenses in USVI peaked in 1997 with 369 individuals, just above 6% from 1996 and 1998 levels.

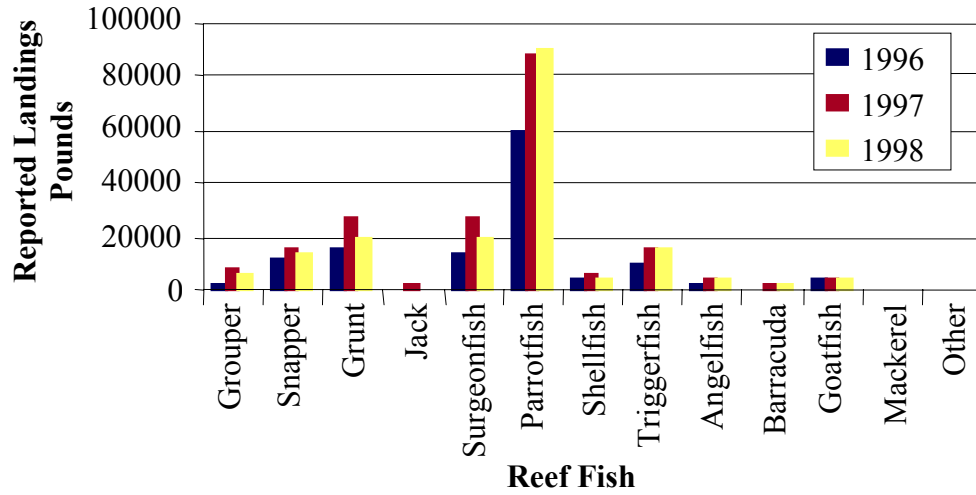
The amounts of commercial landings (lbs) were directly proportional to their financial values. The amounts and earnings of commercial landings in USVI were slightly higher in 1997 compared to 1996 and 1998.

Amount and Value of Commercial Fishery Landings in USVI

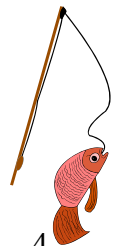
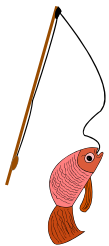
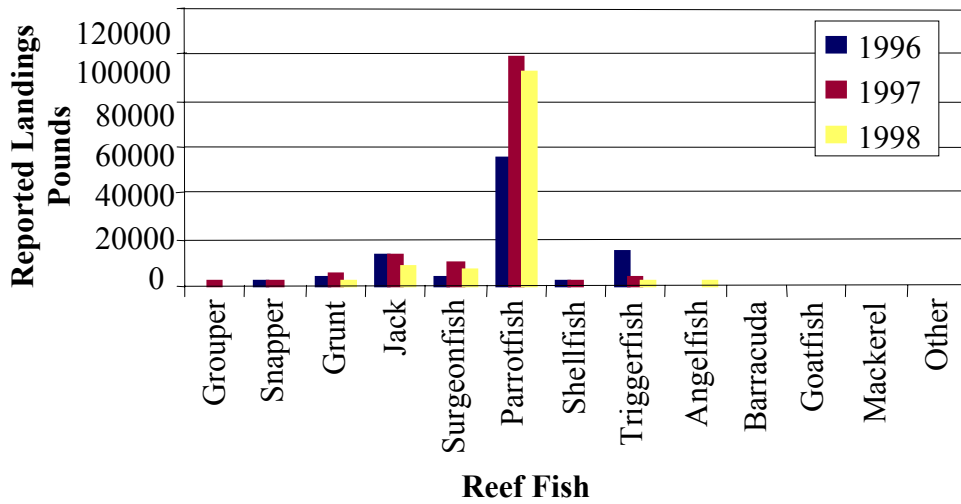


Commercial Catch in St. Croix

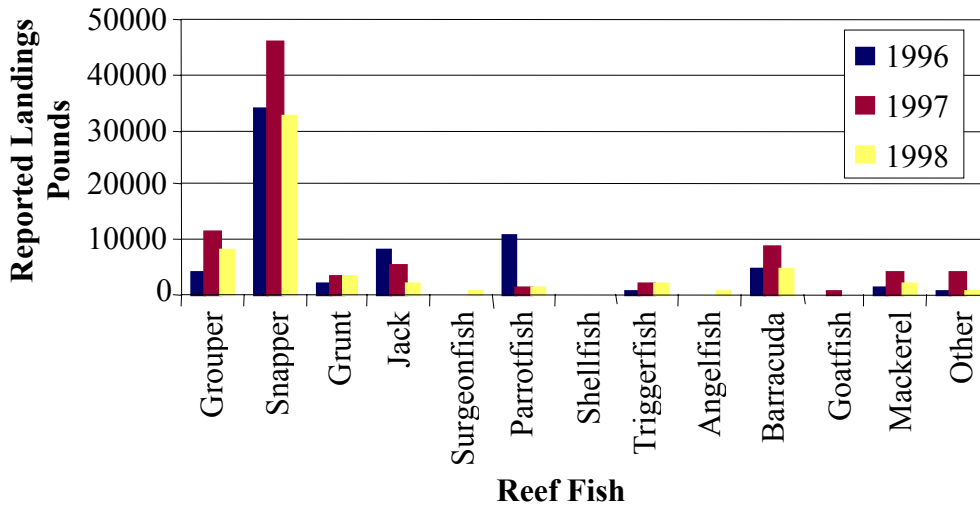
Estimated Commercial Catch Composition for Trap Fishery in St. Croix



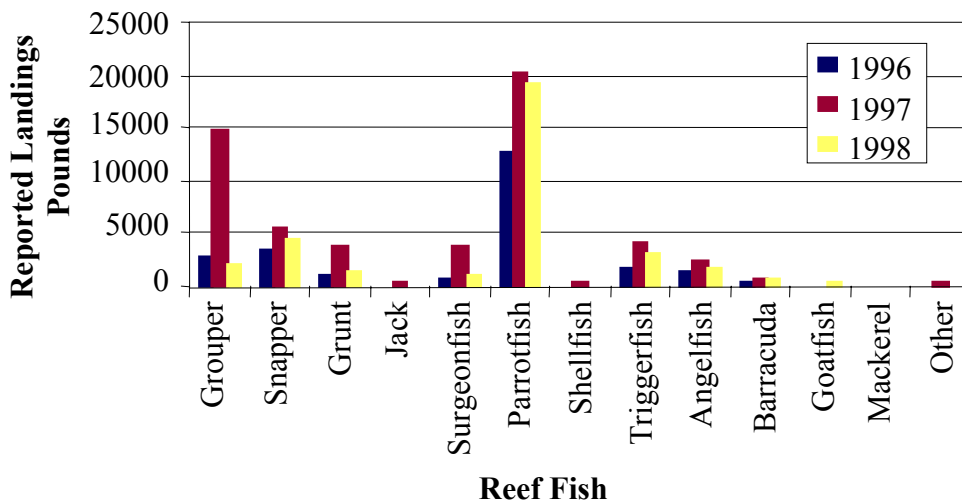
Estimated Commercial Catch Composition for Net Fishery in St. Croix



Estimated Commercial Catch Composition for Line Fishery in St. Croix



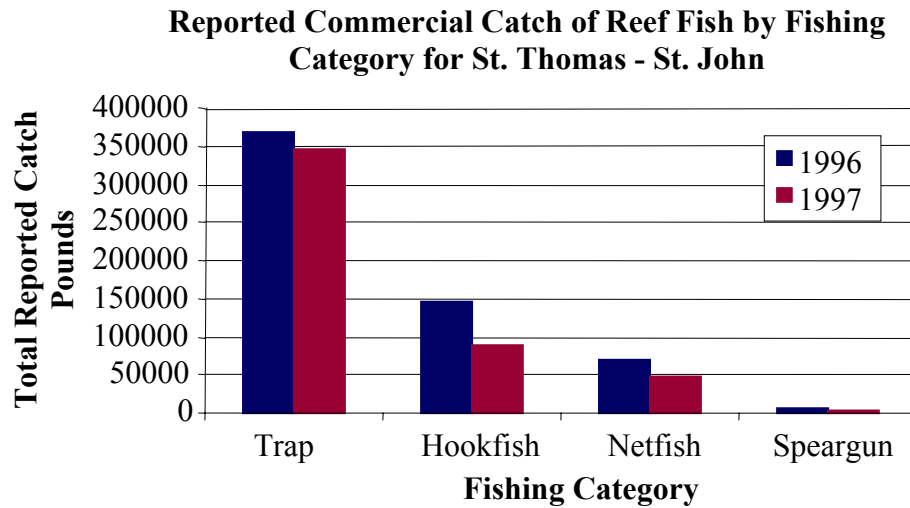
Estimated Commercial Catch Composition for SCUBA Fishing in St. Croix



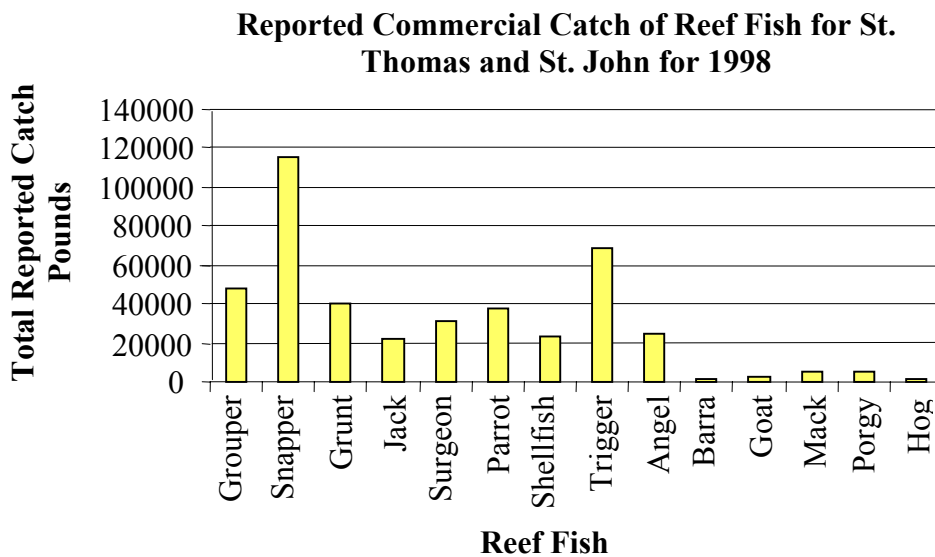
The top four fishing categories yielding the most commercial landings in St. Croix for 1996 – 1998 is trap fishing, followed by net fishing, spear fishing using scuba, and finally hook and line fishing, which also includes some pelagic species.

Parrotfish were caught in larger amounts in nets than scuba, though all three (traps, nets, and scuba) were important. Snapper was the family most caught with line fishing during the same three year period.

Commercial Catch in St. Thomas and St. John



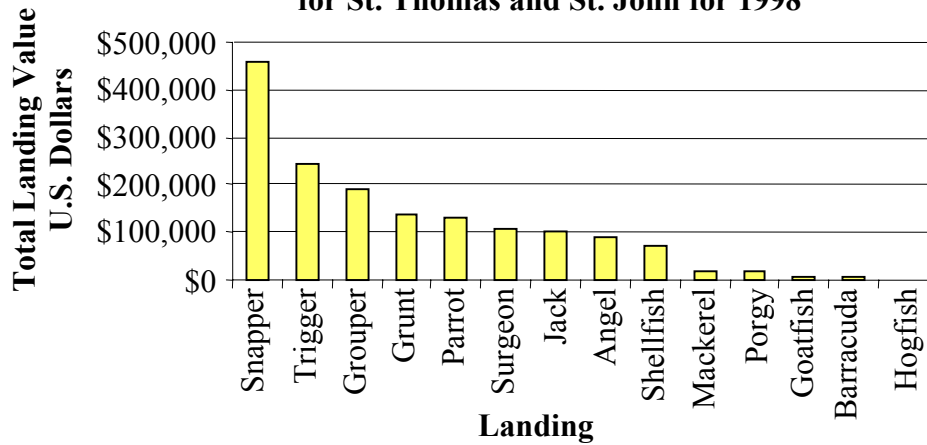
Total reported catch for these categories combined yielded 590,101 lbs in 1996 and 482,956 in 1997.



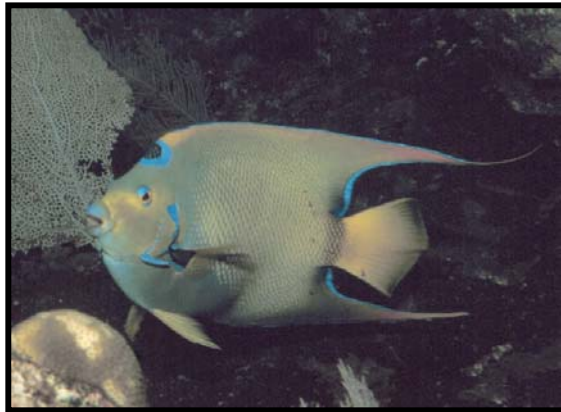
The total reported catch for the listed reef fish in 1998 equaled 424,440 pounds.

The ornamental fish trade is not legally prohibited in the USVI. However, it requires a permit from DPNR and no permits have been approved in recent years.

Monetary Value of Commercial Reef Fishing Landings for St. Thomas and St. John for 1998



Total value of these reef fish in 1998 equaled approximately \$1,579,422.



Queen angel fish.

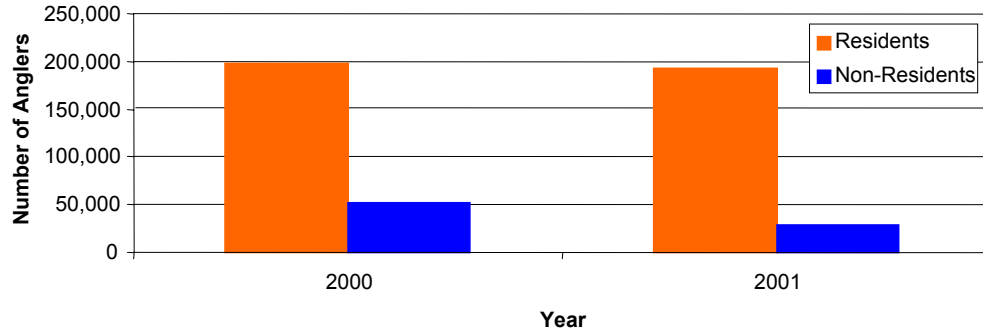
RECREATIONAL FISHING

Recreational fishing in Puerto Rico and USVI does not require a fishing license or catch reports at present. This category refers to all fishermen who fish for leisure or sport, and use their catches for personal benefit or give their catches away. It is illegal for recreational fisherman to sell their catches.

Most sport fishing tournaments involve pelagic species and have a minimal affect on coral reef fisheries.

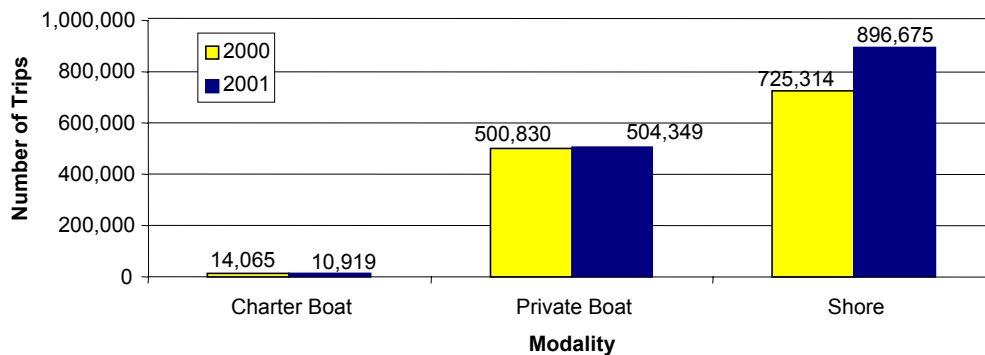
Puerto Rico²

Estimated Number of Recreational Anglers Fishing in Puerto Rico for 2000 and 2001



The combined total number of number of anglers was 249,868 and 222,128 for 2000 and 2001 respectively. However, the 2000 data should be read with caution because DNER suspects that the January and February months were under reported.

Number of Trips by Modality for the Years 2000 and 2001



The most popular modality for recreational fisherman in Puerto Rico is staying in shore, followed by private boat use. Charter boats are the least popular modality and often the most expensive.



School of fish on a reef.

² Source: PRDNER 2001.

US Virgin Islands³

Salt water recreational fishing is one of the most important outdoor activities in USVI.

In 2000, there were 2,462 registered boats in USVI, of which 937 fished recreationally from their boats, including 649 from St. Thomas and St. John, and 288 from St. Croix. Approximately two percent of the population in USVI fished for recreation using boats, and contributed \$5.9 million to the local economy. Of this amount, St. Thomas and St. John contributed to most of this value, \$4.8 million.

Most recreational fishing activities take place on the shoreline in St. Croix, whereas in St. Thomas and St. John, most recreational fishermen use boats.

Based on the 2000 recreational fishing boat survey, the fish family most harvested was the snappers (*Lutjanidae*).

The catch at inshore tournaments in St. Croix were dominated by French grunt (*Haemulon flavolineum*), followed by the squirrelfish (*Holocentrus spp.*).

The catch at inshore tournaments in St. Thomas and St. John were dominated by squirrelfish, followed by the family *Serranidae*.

Trolling was the most common fishing technique (59.7% of respondents), followed by bottom fishing (22.7% of respondents). Rod and reel, hand line, spear fishing, free diving, scuba diving, seine netting and cast netting are also commonly used.

Approximately 82% of the recreational fishermen own a boat between 10 – 29 feet long.

Slightly over half of the recreational fisherman fish within 3 miles from shore (53%).

Most of the recreational fishermen use their catch for personal consumption (73%), followed by giving their catch to friends and relatives (9.3%).

Fisherman's Perspective⁴

During a telephone survey conducted by the University of USVI in 2000, 937 resident boat owners were reported to engage in recreational fishing, of which 120 completed the survey. Respondents answered questions on ways to improve their recreational fishing experience and on recreational fishing licenses, which are summarized below.

³ Source: UVI Eastern Caribbean Center. 2002. Telephone Survey of Boat-Based Marine Recreational Fishing in the U.S. Virgin Islands, 2000. St. Thomas, U.S. Virgin Islands. This data does not account for onshore recreational fishers.

⁴ Source: DPNR 2002.

Ways to Improve Recreational Fishing Experience in USVI			
Option	Yes	No	Total
Enforcement of Laws	95	15	110
Fish Aggregating Devises (FADs)	88	19	107
Public Access	85	27	112
Education	100	14	114
Artificial Reefs	96	21	117
Pollution Control	110	8	118
Do Not Care	55	2	57
Do Not Know	7	5	12

Most respondents answered overwhelmingly in favor of enforcement of laws, the use of FADs, and more public access, education, artificial reefs, and pollution control to improve their recreational fishing experience. Less than half of the respondents said that they did not care to improve their recreational fishing experience.

USVI Recreational Fishermen Support for Recreational Salt Water Fishing License	
Yes	77
No	35
Do Not Know	5
Total	117

Sixty-six percent of the respondents supported a recreational salt water fishing license.

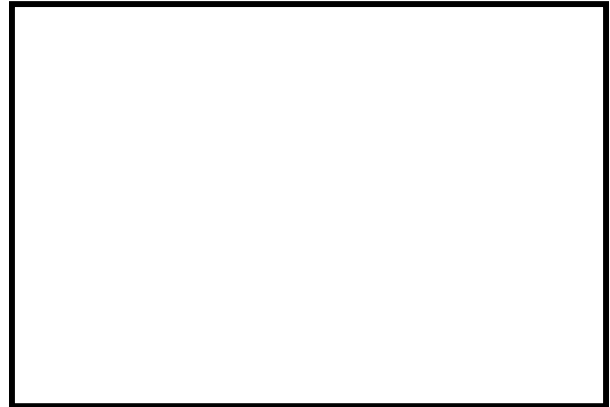
Reasons for Not Supporting Recreational Fishing License in USVI	
Response	Number of fishermen who chose this response
Recreational Fishing Should Not Have Charge	21
No Confidence in the Use of Funds	7
Recreational Fishing Has No Government Support	3
Recreational Fishing Should Not Be Government Concern	3
TOTAL	34

Of those who responded against salt water fishing licenses, 62% of the recreational fishermen believed that a recreational fishing license should not have a charge.

Near Shore Fishing Gear Impacts⁵

Based on conversations with experts from the University of Puerto Rico in Mayagüez, Puerto Rico's DNER, NOAA, the St. Croix dive industry, and a prominent St. Croix fisherman, an informal ranking of fishing gears is shown below, based on the level of threat to coral reef resources.

Gill nets are made from a monofilament line. They are normally deployed in channels, seagrass beds, encircling mangrove islands on algal plains or near coral reef habitats. They are normally fished for on average 5 hours. Possible impacts to habitat could include entanglement and breakage of hard and soft corals, trampling of seagrasses, and stirring up fine sediments. Occasionally nets are lost, causing ghost-fishing and fouling of the habitat from decaying fish entangled in the lost net.



Debris on a coral reef. Photo courtesy of Ron Hill

The trap/pot fishery utilizes traps and fish pots to harvest reef fish from seagrass, algal plains and areas adjacent to coral reef habitats. Traps are approximately 1 x 1 m and ½ m high. Wire mesh of 2 inches is accepted, biodegradable side panels are required to allow the escape of fish and reduce ghost-fishing from lost traps. Typically numerous traps are attached to one another with lines and attached at either end to surface buoys marked with the fisher's identification. Impacts to habitat can occur if traps are set on top of or dragged into coral reefs or other fragile habitats. Traps set into seagrass beds can abrade seagrass particularly in areas of moderate to heavy surge.

The longline/hook and line fishery targets reef fish in shallow and deep coral reef, seagrass lagoon, deep seagrass bed, and algal plain habitats. The main lines are typically 700 feet long with the attached hook line 99 feet long. Hook and line includes hand lines (1 to various hooks per line) and bottom lines (average 11 hooks) lifted either manually or with an electric winch. There is the possibility of fouling of habitat structure with lines and hooks.

Scuba (spear fishing) targets reef fish in shallow and deep coral reef, seagrass lagoon, deep seagrass bed, and algal plain habitats. A potential impact of spear fishing in coral reef communities is the physical damage caused by firing spears underwater in coral habitats (breakage, etc). There are no restrictions on who can spearfish or where (outside reserves). In addition, spearfishers typically target large fish, thus greatly impacting the older reproducing age classes of a population. For example, shifts in reproductive output and sex ratios could be expected among fish such as groupers.

Rod and reel and Hand Lines target larger species including snappers, groupers, barracudas, porgies, pelagics, and other species. They have the potential to snag or hang on hard and soft

⁵ Source: Gear descriptions are taken from CFMC. 1998, ranking comes from various experts in the University and Government Community.

corals, rocks, and patchy corals over seagrass beds. There is the possibility of fouling of habitat structure with lines and hooks.

References

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CFMC (Caribbean Fishery Management Council). 1998. Essential Fish Habitat (EFH) Generic Amendment to the Fishery Management Plans (FMPs) of the U.S. Caribbean (Volume 1). Caribbean Fishery Management Council. San Juan, Puerto Rico. Excerpt from Chapter 5.1 Adverse Impacts of Fishing Activities on Essential Fish Habitat



NOAA Fisheries

