Census of the Marine Commercial Fishers of the U. S. Virgin Islands

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EXECUTIVE SUMMARY

A census of the commercial fishers of the U.S. Virgin Islands (USVI) was conducted from July 2003 to January 2004. A total of 323 commercial fishermen were interviewed, 116 in St. Thomas/St. John District and 217 in St. Croix District. Over 70% of licensed commercial fishers in St. Thomas/St. John District and all the licensed commercial fishers in St. Croix District were interviewed. The census describes the current socioeconomic and demographic characteristics of commercial fishers in the USVI and provides information on their fishing equipment (boats and fishing gear) and fishing related activities.

Commercial fishers in the US Virgin Islands were on average 50.5 years old, had fished almost 23 years and planned to continue to fish for the rest of their lives. Over half the commercial fishers in the USVI had not completed high school. The level of education of commercial fishers in St. Croix District was significantly lower than in St. Thomas/St. John District. More than half of the licensed commercial fishers in St. Croix District had only completed elementary or junior high school. The largest percentage of commercial fishers in the USVI was black. On St. Thomas/St. John the majority of fishers were of French descent while on St. Croix the largest percentage of fishers was Hispanic. Two-thirds of fishers in the USVI identified themselves as full-time fishers and one third identified themselves as part-time or opportunistic fishers. USVI commercial fishers reported earning an average of 64.5% of their income from fishing. Individual fishers earned 0 to 100% of their income from fishing depending on whether they fished primarily for personal consumption or their only income was from fishing.

Most commercial fishers owned a boat with a single outboard motor that they fueled with gasoline. The average boat length in the USVI was 21 feet. Most fishers owned boats ranging in length from 16 to 25 feet. Boats were constructed primarily of fiberglass and wood. Over half of fishers in the USVI carried a cell phone when they fished and a quarter owned a GPS. Echo sounders were installed on over a third of the fishing boats in the USVI. Winches were installed on 25% of the boats in St. Thomas/St. John District while electric reels were installed on about 10% of fishing boats in St. Croix District and 5% in St. Thomas/St. John District.

USVI commercial fishers together and individually targeted a variety of fish and shellfish. The most commonly targeted categories of fish were reef fish and coastal pelagic fish. They caught a wide range of species using a variety of fishing gear that included traps, lines, nets and scuba. There were distinct differences in the gears used in each district. About 50 St. Thomas/St. John District commercial fishers used more than 7,500 fish traps, modified lobster traps, and plastic lobster traps to target fish and lobster. In St. Croix District, traps were not as commonly used. Instead fishers diversified into other gears such as multi-hook vertical setlines, gill and trammel nets, and scuba. These gears were used by fishers in St. Thomas/St. John District as well, but not as commonly. Line fishing using hand lines or less commonly rods and reels was done by most fishers in the USVI.

Fishing in the USVI was generally a day operation. Approximately 80% of fishing trips were under nine hours. The average USVI fisher fished 3.1 times a week for 7.2 hours with one

helper and occasionally a second helper. Each week USVI fishers spent an average of 8 hours selling fish, 3.1 hours fixing their boats and 4.9 hours fixing gear.

Fishers in St. John generally landed their fish in one of 5 locations, most commonly Cruz Bay or Coral Bay. Fishers on St. Thomas landed their fish at one of 19 different locations on the island, most commonly Frenchtown, Hull Bay, and Benner Bay. St. Thomas fishers usually landed their fish at only one site. Fishers on St. Croix landed their fish at 18 different sites on St. Croix and one fisher landed his fish on St. John. The most commonly used landing sites on St. Croix were Altona Lagoon, Molasses Pier and Frederiksted Fisherman's Pier. One-third of St. Croix fishers landed their fish at more than one site.

Fish were primarily marketed whole, gutted, scaled, and or iced. They were commonly sold at the fisher's landing site but also sold along the road, at fish markets, to restaurants, and to retail stores.

Over half the fishers in St. Thomas/St. John District felt that fishing was the same as ten years ago. The one third who felt it was worse gave less fish, area closures and too many traps as the primary reasons for the decline. In contrast, almost 70% of St. Croix fishers thought fishing was worse today than ten years ago. Nearly 40% of fishers felt the decline was due to net fishing and a third felt that too many fishers also contributed to the decline. Only 5% of fishers in the USVI felt that fishing was better than 10 years ago.

This census was compared to surveys of the US Virgin Islands fisheries done in 1930 by Fiedler and Jarvis (1932) and 1968 by Swingle et al. (1970). While the population of the US Virgin Islands increased from 22,012 in 1930 to 108,612 in 2000, the number of fishers stayed nearly the same. Therefore, as a percentage of the total USVI population, the number of fishers declined from 1.8% in 1930 to 0.3% in 2000. The ethnic composition of fishers also changed. The percentage of fishers who were black and white declined between 1930 and 2003. There were no Hispanic fishers reported in 1930. However, by 2003, Hispanic fishers comprised 38.5% of commercial fisher population.

While boat size did not change significantly between 1930 and 2003, the materials used to build boats, the methods of propulsion, and the equipment installed on the boats changed dramatically. In 1930 most boats were constructed of wood. By 2003, wooden boats were uncommon and most boats were constructed of either fiberglass or wood and fiberglass. In 1930, fishers either sailed or rowed to their fishing grounds. By 1968, most boats were outfitted with outboard engines. In 2003, boats not only had engines, many boats had a variety of mechanical and electronic equipment. A number of fishers had installed winches, reels to haul in lines set in deep water, marine radios, and/or echo sounders. A high percentage of fishers carried cell phones when they fished; few carried EPIRBs.

Pots (traps) have been an important fishing gear since 1930 and in 2003 they were still an important component of the fishery, especially in St. Thomas/St. John District. However, other gears such as nets and vertical setlines were more commonly reported in 2003 than in 1930 or 1968.

INTRODUCTION

The US Virgin Islands (USVI) is a territory of the United States that lies in the northeast Caribbean (Fig. 1). It consists of three major islands, St. Thomas, St. John and St. Croix, and about 50 cays (Fig. 2). St. Thomas and St. John, part of the northern Virgin Islands, lie on the Puerto Rico Bank that extends from western Puerto Rico to eastern Anegada in the British Virgin Islands. St. Croix, the largest of the US Virgin Islands, is 40 miles to the south and is separated from the Puerto Rico Bank by a deep trench. The USVI is politically and administratively separated into two districts, St. Thomas/St. John District and St. Croix District.

Surveys of the commercial fishery of the USVI go back to at least 1930 when Fiedler and Jarvis (1932) conducted a survey of the 85% of the fishers and described the fisheries of all three major islands: St. Thomas, St. John and St. Croix. This survey was part of the President Hoover's initiative to improve the economic condition of US Virgin Islanders by analyzing the economic potential of the fishery of the USVI. In 1959 a survey of the commercial fishery of St. John was performed by Idyll and Randall (1959) at the request of the U.S. National Park Service. A brief summary of the St. Croix fishery was presented in 1961 (Anon. 1961) to a meeting of Caribbean Fisheries officers in San Juan, Puerto Rico (in Swingle et al. 1970). The last major survey of USVI fisheries was in 1967-68 when Swingle et al. (1970) surveyed an estimated 69% of full-time fishers and 25% of part-time fishers. Since there was no commercial fisher license in either 1930 or 1967, the universe of commercial fishers could only be estimated when these surveys were conducted. In 1996 a rapid socioeconomic evaluation was undertaken to ascertain the impact of a proposed area closure (marine conservation district) south of St. John (Downs and Petterson 1997). The evaluation consisted of reviewing the literature and interviewing fishers on St. John and St. Thomas to determine the socioeconomic impact of the area closure on the local fishers.

Over thirty years have passed since the last detailed survey of the fishers and fisheries of the USVI (Swingle et al. 1970). Current and detailed information about the commercial fisheries and commercial fishers was sorely needed. NOAA Fisheries and the Caribbean Fishery Management Council identified this need and asked the Department of Planning and Natural Resources, Division of Fish and Wildlife to carry out a census of the commercial fishers of the USVI patterned after the periodic census of commercial conducted in Puerto Rico (Matos Caraballo and Torres Rosado, 1989).

This census describes the socioeconomic and demographic characteristics of commercial fishers in the USVI in 2003 and provides information on their fishing equipment (boats and fishing gear) and fishing related activities. Additionally, fishers were asked their opinions on the condition of their fishery compared to 10 years ago.

Information collected here is one of several baseline information sources (such as commercial catch reports, bio-statistical data from fisher intercept surveys and fisheries independent data collection) that form the basis for good resource management decisions. When this information is coupled with data on catch and effort from the catch reports that are required to be submitted by USVI licensed commercial fishers, from biostatistical data collected by port samplers, and

biological data on fish and shellfish resources, fisheries management measures based on a comprehensive range of information can be adopted to ensure sustainable fisheries in the USVI.

Figure 1: Map showing the location of the Virgin Islands in the Caribbean.

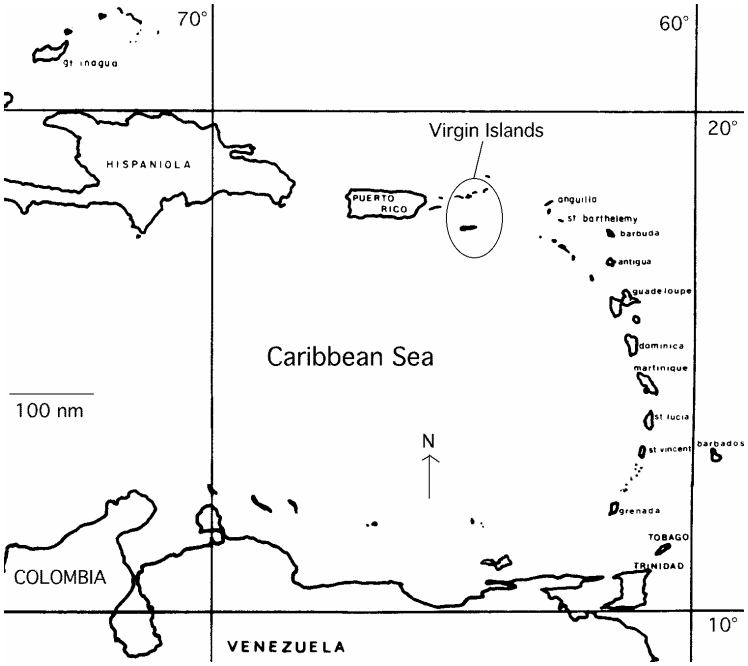
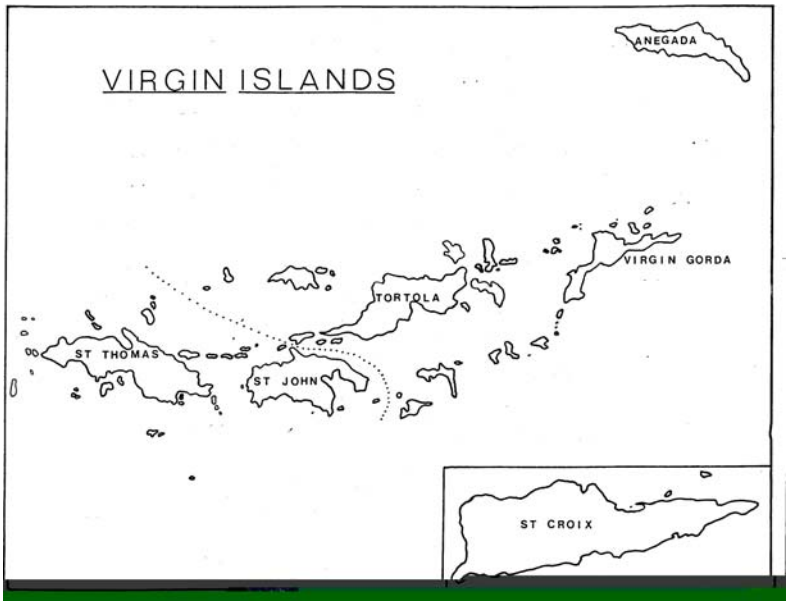


Figure 2: Map of the US Virgin Islands.



MATERIALS AND METHODS

A census of commercial fishers of the U.S. Virgin Islands was conducted from July 2003 to January 2004 in St. Thomas/St. John (STT/STJ) and St. Croix (STX) Districts.

Universe of Commercial Fishers

The universe of licensed commercial fishers was based on the list of licensed commercial fishers available at the Department of Planning and Natural Resources (DPNR), Division of Fish and Wildlife for the 2002-2003 fishing year. The fishing year in the USVI commences July 1st, when fishers are required to renew their licenses, and extends to June 30th of the following year. Three additional licensed fishers were added to the list during the interview period for the census.

Questionnaire Development

The questionnaire used in this survey was modified from the questionnaire used in the periodic census of fishermen, gear units, and fishing vessels in Puerto Rico (Matos Caraballo and Torres Rosado, 1989). A copy of the Puerto Rico questionnaire was provided by the Caribbean Fishery Management Council (CFMC). This questionnaire was modified by Division of Fish and Wildlife (DFW) staff. The revised questionnaire was reviewed by CFMC and DFW staff, pre-tested by conducting several interviews with commercial fishers, revised again and finally approved by CFMC staff. The final approved questionnaire is in Appendix I.

Interviewer Training

A training program was conducted for interviewers on St. Thomas and St. Croix that provided written background on the purpose of the census and detailed information on how to conduct interviews and record fisher responses. Interviewers practiced interviewing a staff who commercially fished. Also, the range of possible responses by fishers was discussed. Interviewers were asked to conduct face to face interviews with fishers.

Fielding of Questionnaire

Interviews were conducted between July 2003 and January 2004. Some fishers were interviewed during the annual commercial fisher registration in July 2003. Other fishers were intercepted and interviewed in the field at landing sites, fish markets, and at fisher meetings held by DFW. Some fishers were contacted by phone and/or mail so that a meeting could be arranged at a convenient time and site for the fisher to be interviewed.

Checking of Questionnaires

Completed questionnaires were reviewed by the author and further information or clarification was requested from the interviewers if required. Respondents were contacted in each district to verify that the surveys had been conducted.

Description of Fishing Gear

A brief description of the gears listed in the questionnaire is provided in Appendix II. Interviewers also photographed a variety of fishing boats and gear used in the USVI for provide a visual record (see Appendix III). Fish and Wildlife staff and some respondents also provided information on how the gears were fished, and in some cases, the species targeted by fishers using the gear.

Data Analysis

Data from the questionnaires were entered into an MS Excel spreadsheet and proofed by the author. Data were entered almost exactly as written on the questionnaires. For example, if a fisher answered a question by providing a range of values (e.g. 2-3 fishing trips per week), the range was entered into the database. Also, if there was an explanatory comment on the questionnaire, it was included in the database. These comments were included for open ended questions as well as for other questions where fishers provided information relating to the question. In some cases responses were summarized. This spreadsheet was provided to the Caribbean Fishery Management Council (CFMC).

In response to the question on ethnicity, some of the black respondents on STX identified themselves as West Indian and provided the Caribbean island that they were from. This was also true of respondents identifying themselves as Hispanic, many of whom gave their original home as Vieques or Puerto Rico. Because not all port samplers elicited a response of West Indian or recorded what island the fisher was from, West Indian was interpreted as black and information was omitted on origin from the Hispanic respondents. However, this information was included in the spreadsheet provided to the CFMC.

The spreadsheet was modified where necessary for data analysis by calculating the means when answers were a range of values. However, the actual range of values provided was based on the full range of values provided by respondents.

RESULTS

Port agents in STT/STJ District conducted successful interviews with 114 of the 160 fishers licensed at the time of this census (July 2003 to January 2004) (Table 1). The 160 fishers included 157 fishers in STT/STJ District that were licensed in the 2002/2003 fishing year (Holt and Uwate, 2004) and three additional fishers who were licensed during the period of the census. Two of the interviews conducted in STT/STJ District were of fishers who fish commercially but who were not licensed; they fished on their own using the license of other licensed commercial fishers. Two licensed fishers refused to be interviewed in STT/STJ District and attempts to contact the remaining 46 STT/STJ District fishers by phone and through the US postal service were unsuccessful.

For STX District, depending upon the data source, there were between 201 and 233 licensed commercial fishers (average 217) for the 2002/03 fishing year (see Holt & Uwate, 2004). A total of 223 questionnaires were completed in STX District. Port agents conducted successful interviews with 217 licensed commercial fishers. Six questionnaires were partially completed based on information from Division of Fish and Wildlife office files. These six additional licensed commercial fishers could not be contacted because they were recently deceased (one fisher) or were off island for an extended period, e.g. in the military, or making an extended visit to the mainland US or their home island. Interviewers censused the entire universe of active STX licensed commercial fishers. No unlicensed fishers were interviewed on STX.

Table 1: Fisher response rate – US Virgin Islands Commercial Fisher Census 2003.

District	No. of licensed commercial fishers	No. of licensed fishers interviewed	% of licensed fishers interviewed	# of unlicensed fishers interviewed	# of fishers who refused to be interviewed	# of fishers unable to be contacted[1]
STT/STJ[2]	160	114	71%	2	2	46
STX[3]	223	217	97%	0	0	0
USVI	383	331	87%	2	2	46

[1]Port agents attempted to contact fishers who they had not interviewed by sending a letter through the US postal service requesting that fishers call the port agents. They also phoned about half of these fishers, but were unable to speak to them.
[2]13 STJ and 103 STT commercial fishers were interviewed.
[3]Port agents submitted 223 questionnaires: 217 interviews were completed and 6 questionnaires were partially completed from information in DPNR Division of Fish and Wildlife files.

Question 1: Name of Commercial Fisher and Question 3. Nickname.

This is confidential information and will not be reported on in this document.

Question 2: Ethnicity.

The majority of commercial fishers in the USVI identified themselves as black or West Indian (38.5%), Hispanic (33.1%) or French (16.7%) (Table 2). Most fishers in STT/STJ District were of French descent (black and white) (55.2%) or black (32.5% or 38.6% including those who responded black French). Most commercial fishers in STX District were either Hispanic or black (Table 2).

Table 2 (Q. 2): Ethnic composition of commercial fishers in the US Virgin Islands. (The most common response is in bold type.)

	STT/STJ District		**STX District**		**USVI**	
Ethnic Group	**N[1]**	**Percent**	**N**	**Percent**	**N**	**Percent**
French[2]	**56**	**49.1%**	0	0.0%	56	16.7%
Black French	7	6.1%	0	0.0%	7	2.1%
White	10	8.8%	17	7.7%	27	8.1%
Hispanic	4	3.5%	**107**	**48.4%**	111	33.1%
Black[3]	37	32.5%	92	41.6%	**129**	**38.5%**
Black Hispanic	0	0.0%	4	1.8%	4	1.2%
East Indian	0	0.0%	1	0.5%	1	0.3%
Total	114	100.0%	221	100.00%	335	100.0%

[1]N = total number of fishers who responded to this question or whose ethnicity was known by staff in the case of questionnaires completed from DFW office records.
[2]Of French descent. Did not include fishers who identified themselves as black French.
[3]In St. Thomas/St. John District, black did not include people who considered themselves black and French. In St. Croix District, black included people who identified themselves as West Indians.

Question 4: **Age.**

Fishers in STX District were on average older than STT/STJ District (Table 3, Fig. 3). However, the difference was not statistically significant (two-tailed t-test = 1.96, $p = 0.0589$, df = 326). The oldest licensed commercial fisher in the USVI was 85 and resided on St. Thomas. The modal age class in STT/STJ District was 41-50 years (Fig. 3), while in St. Croix District the peak age class was 51-60 years.

Table 3 (Q. 4): Age of commercial fishers in the US Virgin Islands.

	St. Thomas/St. John District	**St. Croix District**	**USVI**
Mean age (yrs) (SD[1])	48.6 (±12.89)	51.4 (±12.51)	50.5 (±12.68)
Median age (yrs)	49	53	52
Mode of age (yrs)	45	60	47
Minimum age (yrs)	21	20	20
Maximum age (yrs)	85	80	85
Total[2]	107	221	328

[1]SD = Standard Deviation
[2]Total = total number of fishers who responded to this question

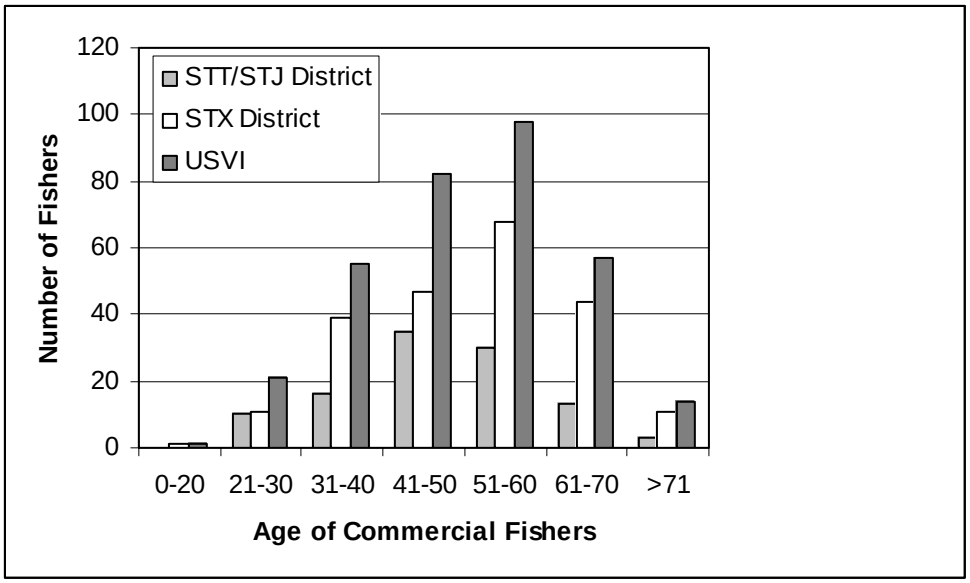


Figure 3 (Q.4): Age distribution of commercial fishers in the US Virgin Islands in 2003.

Question 5: Phone and Question 6: **Address.**

This is confidential information and will not be included here. These questions were asked in case any follow up was required. They were also asked to ensure that fishers with similar names could be differentiated.

Question 7: Level of Education Completed.

The level of education of commercial fishers was assigned to one of six categories (Table 4). There was a highly significant difference in the education level of fishers in the two districts (Wilcoxon Rank Sum Test – U Statistic = 4.073, N = 318, two-tailed $p = 0.00$). More fishers in STT/STJ District had a higher level of education than in STX District. The percentage of fishers that left school at the elementary or junior high school level was higher on St. Croix (54.2%) than on St. Thomas (20.2%). Also, a higher percentage of fishers in STT/STJ District (51.9%) had completed at least a high school than in STX District (36%). Over half the commercial fishers in the USVI (58.7%) had not completed high school.

Table 4 (Q.7): Education level of commercial fishers in the US Virgin Islands.

	St. Thomas/ St. John District		**St. Croix District**		**USVI**	
Education Level	**N***	**Percent**	**N**	**Percent**	**N**	**Percent**
Elementary School	10	9.6%	55	25.7%	65	20.4%
Junior High School	11	10.6%	**61**	**28.5%**	72	22.6%
Some High School	29	27.9%	21	9.8%	50	15.7%
High School	**43**	**41.3%**	54	25.2%	**97**	**30.5%**
Some College	5	4.8%	13	6.1%	18	5.7%
College	6	5.8%	10	4.7%	16	5.0%
Total	104	100.0%	214	100.0%	318	100.0%

*N = total number of fishers who responded to this question.

Question 8: Type of fisher - full-time (>36hrs/week), **part-time (≤36hrs/week), opportunistic**, **or charter**.

Two-thirds of commercial fishers in the USVI considered themselves full time commercial fishers (Table 5) based on the amount of time (defined as >36 hrs per week) they spent fishing and carrying out fishing related activities such as constructing and repairing gear, maintaining their boats, and selling their catch. However, there was a higher percentage of commercial fishers in STX District (39%) who considered themselves part-time or opportunistic fishers than in STT/STJ District (21.8%).

Table 5 (Q. 8): Responses of commercial fishers to the question of whether they were full time fishers (>36 hrs/week spent doing fishing related activities), part time fishers (≤36 hrs/week), opportunistic fishers, or charter fishers.

	St. Thomas/ St. John District		**St. Croix District**		**USVI**	
Type of Fisher	**N***	**Percent**	**N**	**Percent**	**N**	**Percent**
Full Time	**85**	**77.3%**	**130**	**61.0%**	**215**	**66.6%**
Part Time	21	19.1%	67	31.5%	88	27.2%
Opportunistic	3	2.7%	16	7.5%	19	5.9%
Charter	1	0.9%	0	0.0%	1	0.3%
Total	110	100.00%	213	100.0%	323	100.0%

*N = total number of fishers who responded to this question.

Question 9: **Are you a licensed commercial fisher?**

In STT/STJ District all but two of the 114 interviewees who responded to this question were licensed. The two unlicensed fishers commercially fished on their own under another fisher's license. One of the two fished using his father's license. In STX District, all 217 respondents were licensed commercial fishers.

Question 10. Do you belong to a commercial fishing organization?

Most commercial fishers on STT/STJ District (98.2%) did not belong to any fishing organization (Table 6). Although this was true in STX District (76%) as well, a substantial number (20.3%) belong to the Fishermen's United Services Cooperative (St. Croix) (Table 6).

Table 6 (Q. 10): Number and percentage of commercial fishers belonging to a fishing organization in the US Virgin Islands.

	St. Thomas/ St. John District		St. Croix District		USVI	
Organizations	**N**	**Percent**	**N**	**Percent**	**N**	**Percent**
No organization	**111**	**97.3%**	**165**	**76.0%**	**276**	**83.4%**
STT/STJ Fishery Advisory Committee	1	0.9%		0.0%	1	0.3%
STX Fishery Advisory Committee		0.0%	1	0.5%	1	0.3%
VI Game Fishing Club	1	0.9%		0.0%	1	0.3%
Golden Hook Fishing Club		0.0%	2	0.9%	2	0.6%
Fishermen's United Services Cooperative STX		0.0%	44	20.3%	44	13.3%
Belonged to organization but no name provided		0.0%	4	1.8%	4	1.2%
Caribbean Fishery Management Council (CFMC) – Scientific and Statistical Committee		0.0%	1	0.5%	1	0.3%
CFMC – Advisory Panel		0.0%	2	0.9%	2	0.6%
CFMC – Council Member	1	0.9%		0.0%	1	0.3%
Total # of respondents	114	100.0%	217[1]	100.9%[1]	331	100.6%
Total # of responses	114		219		333	

[1]Two respondents indicated that they belonged to more than one organization.

Question 11. What do you commercially fish for?

Interviewers asked fishers what category of fish they targeted (Table 7). The most common category of fish harvested by fishers in both districts was reef fish (82.3%) (Table 7). In STX District, deepwater snapper was the second most commonly targeted category with 42.3% of fishers targeting this group. Deepwater snapper were not commonly fished on STT/STJ (only 4.5% of fishers targeted this category). Deepwater pelagic fish were also more commonly targeted in STX District (33.0%) than in STT/STJ District (9.8%) where coastal pelagic fish were targeted by a higher percentage of fishers (Table 7). Lobsters were an important target species in both STT/STJ and STX Districts. Conch were an important part of the fishery in STX District with 84 fishers (39%) indicating that they fished for conch. In STT/STJ District only 10 fishers (8.9%) stated that they fished for conch. In contrast, whelk was fished by more fishers in STT/STJ District (14.3%) than in STX District (4.7%).

Table 7 (Q. 11): Number and percentage of commercial fishers targeting various categories of fish, mollusks, and crustaceans in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
Categories of fish	**N[1]**	**Percent**	**N**	**Percent**	**N**	**Percent**
Reef fish	**87**	**77.7%**	**182**	**84.7%**	**269**	**82.3%**
Coastal pelagic	60	53.6%	80	37.2%	140	42.8%
Deep pelagic	11	9.8%	71	33.0%	82	25.1%
Deepwater snapper	5	4.5%	91	42.3%	96	29.4%
Bait fish	33	29.5%	31	14.4%	64	19.6%
Conch	10	8.9%	84	39.1%	94	28.7%
Whelk	16	14.3%	10	4.7%	26	8.0%
Lobster	40	35.7%	87	40.5%	127	38.8%
Total # responses	262		636		898	
Total # respondents	112	234.0%[2]	215	295.9%	327	274.7%

[1]N = total number of fishers who responded to this question.
[2]Percent totals more than 100% because fishers frequently fished more than one category.

Number of different categories of fish targeted by fishers

Only 30.4% of fishers in STT/STJ District and 19.1% in STX District targeted fisheries products in only one category (Table 8). Most fishers in the USVI targeted fish in at least 2 to 4 different categories.

Table 8 (Q. 11): Number and percentage of commercial fishers harvesting one or more than one category of fish listed in Table 7 in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
No. of different categories fished by fishers	**N[1]**	**Percent**	**N**	**Percent**	**N**	**Percent**
1	34	30.4%	41	19.1%	75	22.94%
2	**42**	**37.4%**	**59**	**27.4%**	**101**	**30.89%**
3	18	16.1%	48	22.3%	66	20.18%
4	9	8.0%	35	16.3%	44	13.46%
5	4	3.6%	15	7.0%	19	5.81%
6	3	2.7%	6	2.8%	9	2.75%
7	1	0.9%	6	2.8%	7	2.14%
8	1	0.9%	5	2.3%	6	1.83%
Total	112	100.0%	215	100.0%	327	100.00%

[1]N = total number of fishers who responded to this question.

Question 12: How many years have you fished? and How many more years do you expect to keep fishing?

The average number of years respondents had fished in the USVI is 22.8 years (Table 9). A two-sample t-test (equal variances) revealed that there was a significant difference in the number of years respondents fished in the two districts (t = 2.03, df = 328, p = 0.04). On average, fishers had fished longer in STT/STJ District than in STX District.

Table 9 (Q.12): Mean, standard deviation (SD), and range of years that commercial fishers stated that they fished in the US Virgin Islands.

Number of years fished	St. Thomas/St. John District	St. Croix District	USVI
Mean (SD)	24.8 (±13.7)	21.7 (±12.6)	22.8 (±13.5)
Range	2 - 67	0 - 65	0 - 67
N*	115	215	330

*N = total number of fishers who responded to this question.

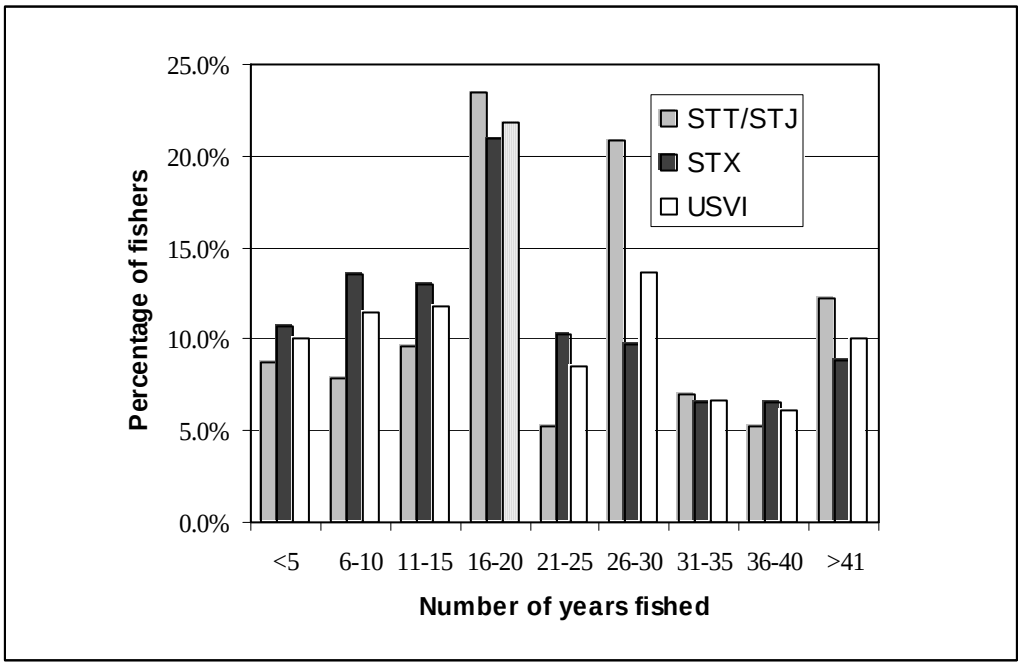
In STT/STJ District almost 50% of fishers fished for 16 to 30 years (Table 10). In STX District, slightly over 40% of fishers fished for this length of time. Respondents in STT/STJ District fished more years than respondents in STX District (Fig. 4). The relatively low percentage of new entrants to the fishery was in part because of a moratorium on issuance of new licenses that had been in effect since August 24, 2001. A higher percentage of respondents in STX District fished <15 years (37.2%) than STT/STJ District (26.1%).

Table 10 (Q. 12): Number of years that commercial fishers stated that they fished in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
No. years	**N***	**%**	**N**	**%**	**N**	**%**
≤5	10	8.7%	23	10.7%	33	10.0%
6-10	9	7.8%	29	13.5%	38	11.5%
11-15	11	9.6%	28	13.0%	39	11.8%
16-20	**27**	**23.5%**	**45**	**20.9%**	**72**	**21.8%**
21-25	6	5.2%	22	10.2%	28	8.5%
26-30	24	20.9%	21	9.8%	45	13.6%
31-35	8	7.0%	14	6.5%	22	6.7%
36-40	6	5.2%	14	6.5%	20	6.1%
>41	14	12.2%	19	8.8%	33	10.0%
Total	115	100.0%	215	100.0%	330	100.0%

*N = total number of fishers who responded to this question.

Figure 4 (Q. 12): Number of years commercial fishers have fished in the US Virgin Islands.



STT/STJ = St. Thomas/St. John District, STX = St. Croix District, USVI = US Virgin Islands

Over half the fishers in the USVI planned to fish for life (52.8%) (Table 11). Over 70% of fishers in STT/STJ District, planned to fish for life and only 4.4% planned to fish less than 5 years, while in STX District 41% planned to fish for life and 12% planned to continue fishing for less than 5 years.

Table 11 (Q. 12): Number of years commercial fishers expected to continue to fish in the US Virgin Islands.

	St. Thomas/St. John District		**St. Croix District**		**USVI**	
No. years	**N***	**%**	**N**	**%**	**N**	**%**
<5	5	4.4%	27	12.8%	32	9.9%
6-10	11	9.7%	51	24.2%	62	19.1%
11-15	1	0.9%	8	3.8%	9	2.8%
15-20	9	8.0%	24	11.4%	33	10.2%
21-25	1	0.9%	7	3.3%	8	2.5%
>25	2	1.8%	7	3.3%	9	2.8%
life	**84**	**74.3%**	**87**	**41.2%**	**171**	**52.8%**
Total	113	100.00%	211	100.00%	324	100.0%

*N = total number of fishers who responded to this question.

Question 13: **How many fishing boats do you own for commercial fishing?**

Most of the boats included in Table 12 were registered fishing boats that were actively used in the fishery. Fishers also reported unregistered fishing boats that were under repair. A few fishers provided information on dinghies used to access their fishing boats and these were also included in Table 12. Only 7% of USVI commercial fishers did not own a boat; most fishers owned just one boat (Table 12).

Table 12 (Q. 13): Number of boats owned by commercial fishers in the US Virgin Islands.

Number of boats[1]	**St. Thomas/St. John District**		**St. Croix District**		**USVI**	
	N[2]	**%**	**N**	**%**	**N**	**%**
0	13	11.3%	10	4.7%	23	7.0%
1	**70**	**60.3%**	**161**[3]	**75.9%**	**231**	**70.4%**
2	26	22.4%	35	16.5%	61	18.6%
3	7	6.0%	4	1.9%	11	3.4%
4	0	0.0%	2	1.0%	2	0.6%
Total	116	100.00%	212	100.00%	328	100.00%
Mean	1.2		1.2		1.2	

[1]If fishers co-owned a boat or boats, the number of boats was divided among the fishers and rounded up to the next whole number.
[2]N=Total number of fishers who responded to this question.
[3] Included a boat owned not by the fisher but by the son of the fisher.

Question 14: Registration numbers for each boat owned.

Based on the registration numbers provided and responses that indicated that the fisher owned a boat but could not remember the registration number, there were an average of 1.1 boats per fisher in the USVI (Table 13). This result is similar to the result shown in Table 12.

Table 13 (Q. 14): Total number of boats that commercial fishers stated was registered and mean number of boats owned by commercial fishers in the US Virgin Islands.

	St. Thomas/St. John District	**St. Croix District**	**USVI**
Number of boats	135	225	360
No. of respondents	116	217	333
Mean # of boats	1.2	1.0	1.1

Question 15: Year boat built.

Nearly forty-two percent (42%) of vessels used by commercial fishers in the USVI were built before 1981 with the highest percentage of vessels in both districts built between 1971-1980 (Table 14).

Table 14 (Q. 15): Age of boats used by commercial fishers in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
Age of boat	**N**	**%**	**N**	**%**	**N**	**%**
≤1960	1	1.6%	0	0.0%	1	0.6%
1961-1970	4	6.3%	6	4.9%	10	5.3%
1971-1980	**23**	**35.8%**	**44**	**35.8%**	**67**	**35.8%**
1981-1990	20	31.3%	29	23.6%	49	26.2%
1991-2000	15	23.4%	40	32.5%	55	29.4%
≥2001	1	1.6%	4	3.3%	5	2.7%
Total # of responses[1]	64	100.0%	123	100.0%	187	100.00%
# of "don't know" responses[2]	45		99		144	

[1]N = number of boats for which a fisher provided the age of the boat
[2]Number of responses for which a fisher did not know the age of the boat.

Question 16: Boat length.

A two-sample t-test (unequal variances) revealed that there was no significant difference in the mean size of boats used by commercial fishers in the two districts ($t = 0.98$, df = 224.5, $p = 0.327$). The mean size of boats owned by commercial fishers in the USVI was 21.0 feet (Table 15). Boat size ranged from 6 to 54 feet with the smaller boats being dinghies used primarily to access the larger fishing boats on moorings. Almost three quarters of commercial fishers in the USVI fished from boats 16 – 25 feet in length (Table 16). A higher percentage of fishers in STT/STJ District (25.9%) had boats >26 feet compared with STX District (8.8%).

Table 15 (Q. 16): Length of boats (feet) used by US Virgin Islands commercial fishers.

	St. Thomas/St. John District	St. Croix District	USVI
Mean (SD[1])	21.4 (±7.5)	20.7 (±5.4)	21.0 (±6.2)
Range	6 – 48	10 – 54	6 – 54
Number of boats	139	248	387
N[2]	101	202	303

[1]SD = Standard Deviation
[2]N = Number of fishers who responded to this question.

Table 16 (Q. 16): Number and percentage of boats in different length classes used by US Virgin Islands commercial fishers.

	St. Thomas/St. John District		St. Croix District		USVI	
Length of boats (feet)	**N***	**%**	**N**	**%**	**N**	**%**
≤10	9	6.5%	2	0.8%	11	2.8%
11-15	12	8.6%	26	10.5%	38	9.8%
16-20	**49**	**35.3%**	**107**	**43.1%**	**156**	**40.3%**
21-25	33	23.7%	91	36.7%	124	32.0%
26-30	18	12.9%	11	4.4%	29	7.5%
31-35	13	9.4%	5	2.0%	18	4.7%
35-40	4	2.9%	4	1.6%	8	2.1%
>40	1	0.7%	2	0.8%	3	0.8%
Total # boats	139	100.0%	248	100.0%	387	100.0%
Total # respondents	101		202		303	

*N = number of boats in size class

Question 17: Number and type of engine.

About 85% of commercial fishing boats in the USVI were powered by outboard engines with the highest proportion of fishing boats powered by outboard engines in STX District (92.5%) (Table 17). Seventy percent (70%) of commercial fishers in the USVI used only one outboard engine on their boats with a higher proportion of STT/STJ fishers having only one outboard engine (83%) compared to STX fishers (64.7%) (Table 18).

STT/STJ District fishers had a higher proportion of boats with inboard and inboard/outboard engines (27.1%) on their fishing boats than did STX District fishers (7.5%) (Table 17). Three of the 15 fishing boats in STX District that were powered by inboard engines had two engines, while none of the STT/STJ District boats with inboard engines had more than one engine. Three commercial fishers in STX District fished using small aluminum boats with no engines; they simply rowed their boats.

Table 17 (Q. 17): Number and percentage of commercial fishing boats with inboard, outboard, or inboard/outboard engines in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
Type of Engine on boats	**N***	**%**	**N**	**%**	**N**	**%**
Inboard	33	25.6%	18	7.5%	51	13.9%
Outboard	**94**	**72.9%**	**221**	**92.5%**	**315**	**85.6%**
Inboard/Outboard	2	1.5%	0	0%	2	0.5%
Total # boats	129	100.0%	239	100.0%	368	100.00%
Total # respondents	96		204			

*N = number of boats

Table 18 (Q. 17): Number of outboard engines used per fishing boat in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
No. outboard engines per boat	**N***	**%**	**N**	**%**	**N**	**%**
1	**78**	**83.0%**	**143**	**65.6%**	**221**	**70.1%**
2	16	17.0%	74	33.9%	90	28.6%
3	0	0.0%	1	0.5%	1	0.3%
Total	94	100.0%	218	100.00%	315	100.0%

*N= number of fishers responding to this question.

Question 18: Horsepower of engines.

A wide range of engine sizes was used by commercial fishers. Most fishers used outboard engines on their boats and most engines were between 26 to 150 hp (Table 19). Inboard engines were larger, most having >100 hp (Table 20).

Table 19 (Q. 18): The number and percentage of outboard engines in different size classes used by commercial fishers in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
Engine hp	**N***	**%**	**N**	**%**	**N**	**%**
≤25	10	9.2%	42	14.2%	52	12.9%
26-50	**37**	**33.9%**	49	16.5%	86	21.2%
51-75	17	15.6%	**72**	**24.3%**	**89**	**21.9%**
76-100	13	11.9%	60	20.2%	73	18.0%
101-150	18	16.5%	49	16.5%	67	16.6%
151-200	10	9.2%	16	5.6%	26	6.4%
>200	4	3.7%	8	2.7%	12	3.0%
Total # responses	109	100.0%	296	100.0%	405	100.0%

*N = number of responses

Table 20 (Q. 18): The number and percentage of **inboard** engines in different size classes used by commercial fishers in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
Engine hp	**N***	**%**	**N**	**%**	**N**	**%**
≤25	0	0.0%	1	4.0%	1	2.0%
26-50	0	0.0%	2	8.0%	2	4.1%
51-75	0	0.0%	0	0.0%	0	0.0%
76-100	0	0.0%	0	0.0%	0	0.0%
101-150	3	125%	2	8.0%	5	10.2%
151-200	**11**	**45.8%**	3	12.0%	14	28.6%
>200	10	41.7%	**17**	**68.0%**	**27**	**55.1%**
Total # of responses	24	100.0%	25	100.0%	49	100.0%

*N = number of responses

Question 19: Type of fuel.

Fuel used in outboard motors was primarily gas or gas and oil (Table 21). Inboard engines predominately used diesel fuel.

Table 21 (Q. 19): Type of fuel used in engines in commercial fishing boats in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
Fuel Type	**N[1]**	**%**	**N**	**%**	**N**	**%**
Outboard Engine						
Gas	**74**	**83.1%**	**142**	**65.7%**	**216**	**70.8%**
Gas & Oil	15	16.9%	73	33.8%	88	28.9%
Diesel	0	0.0%	1	0.5%	1	0.3%
Total	89	100.0%	216	100.0%	305	100.0%
Inboard Engine						
Gas	0	0.0%	7	38.9%	7	13.7%
Gas & Oil	1[2]	3.0%	0	0.0%	1	2.0%
Diesel	**32**	**97.0%**	**11**	**61.1%**	**43**	**84.3%**
Total	33	100.0%	18	100.0%	51	100.0%

[1]N = Number of engines of each type.
[2]It is likely that this response is not accurate unless many boats have oil injected engines and the fishers responded gas because they did not premix oil with the gas.

Question 20: Do you own the boat you use for commercial fishing?

Most commercial fishers in the USVI (94%) owned or co-owned the boat that they used for fishing (Table 22). There was little difference in the boat ownership rates between districts.

Table 22 (Q. 20): Number and percentage of commercial fishers owning boats in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
# of boat owners	**N***	**%**	**N**	**%**	**N**	**%**
Boat owner or co-owner	96	94.1%	177	93.7%	273	93.8%
Do not own boat	6	5.9%	12	6.3%	18	6.2%
Total	102	100.00%	189	100.00%	291	100.00%

*N = number of fishers who responded to this question.

Question 21: Boat Material.

Most commercial fishing boats in the USVI were constructed of fiberglass or fiberglass and wood (Table 23).

Table 23 (Q. 21): Number and percentage of commercial fishing boats constructed of various types of material in the USVI.

	St. Thomas/St. John District		St. Croix District		USVI	
Construction material	**N***	**%**	**N**	**%**	**N**	**%**
Aluminum	2	1.5%	11	4.4%	13	3.4%
Fiberglass	**79**	**57.6%**	**200**	**80.7%**	**279**	**72.4%**
Fiberglass & wood	50	36.5%	31	12.5%	81	21.0%
Wood	6	4.4%	5	0.4%	1	2.9%
Steel	0	0.0%	1	2.0%	11	0.3%
Total	137	100.0%	248	100.00%	385	100.0%

*N = number of responses.

Question 22: Boat electronic equipment.

Only 9% of commercial fishers in the USVI carried an EPIRB on their boats (Table 24). The percentage of commercial fishers in STT/STJ District carrying EPIRBs was twice as high as STX District but still very low (12.6%). Over half carried cell phones and nearly a third marine radios.

Table 24 (Q. 22): Number of various types of electronic equipment used on commercial fishing boats and the percentage of boats using each type of equipment.

	St. Thomas/St. John District		St. Croix District		USVI	
Electronic Equipment	**N[1]**	**%[2]**	**N**	**%**	**N**	**%**
Echo Sounder	**73**	**52.5%**	71	28.6%	144	37.2%
Cell Phone	**74**	**53.2%**	**158**	**63.7%**	**232**	**59.9%**
GPS	58	41.7%	37	14.9%	95	24.5%
EPIRB	19	13.7%	16	6.5%	35	9.0%
Radar	2	1.4%	4	1.6%	6	1.6%
Marine Radio	64	46.0%	53	21.4%	117	30.2%
Total # responses	290		339		629	
Total	139[3]	408.5%	248[3]	136.7%	387[3]	162.4%

[1]N = number of responses
[2]Percentage of boats with equipment
[3] Total # of boats

Question 23: Fishing equipment.

Respondents indicated the type of fishing equipment they had installed on their vessels (Table 25). In STT/STJ District, the most common equipment onboard fishing vessels was a winch, reflecting the importance of trap fishing in the district. In STX District, the most common

equipment was an electric reel, reflecting the importance of deepwater snapper fishing in this district.

Table 25 (Q. 23): Number of various types of fishing equipment used on commercial fishing boats in the USVI and the percentage of boats using each type of equipment.

	St. Thomas/St. John District		**St. Croix District**		**USVI**	
Fishing Equipment	**N**[1]	**%**[2]	**N**	**%**	**N**	**%**
Winch	**37**	**26.6%**	18	7.3%	**55**	**14.2%**
Hydraulic Reel	5	3.6%	2	0.8%	7	1.8%
Electric Reel	7	5.0%	**25**	**10.2%**	32	8.3%
Gas Reel	1	0.7%	1	0.4%	2	0.5%
Hand Reel	0	0.0%	8	3.2%	8	2.1%
Total # responses	50		54		108	
Total	139[3]	35.9%	248[3]	21.9 %	387[3]	26.9%

[1]N = number of responses
[2]Percentage of boats with equipment
[3] Total # of boats

Question 24: Fishing gear used by commercial fishers.

Fishers were asked detailed questions about their fishing gear (see page 2 of the questionnaire, Appendix I). Brief descriptions of these gears are in Appendix II. Responses to this question are provided in Tables 26 to 44.

One of the gears or fishing methods listed, hookah diving, was not used by fishers in either district.

Several gears were only recorded from one district. These included ballyhoo nets (Table 27), which were only used on STT/STJ District. This gear was not listed on the questionnaire and as a result others may have used these specialized nets but not reported their use to interviewers. Modified fish pots (traps) (Table 34) and plastic lobster pots (Table 33) were also only recorded in STT/STJ District. Umbrella nets (Table 32) and deepwater shrimp pots (Table 34) were only recorded from STX District (Table 32). However, even there, few fishers use these gears.

A few gears were used primarily in one district. These included gill nets (Table 29), trammel nets (Table 30), and scuba diving (Table 44), which were predominately used in STX District.

Other gears were not commonly used in either district. These included haul seines (Table 28), surface longlines (Table 36), and bottom longlines (Table 37).

When asked to describe their gears, fishers reported two fishing methods that were not listed in the questionnaire. These were relatively new methods to the USVI. The methods, the PVC pipe lobster attractor and “reel buoy fishing,” are described in Appendix II.

Table 26 (Q. 24): Summary of **beach seine** information from respondents.

Location	**# of fishers sampled owning gear**	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean*** ***Max*** ***Min*** ***SD***	**# of gears fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**Construction material:** **(#) = N[1]**	**Bar Mesh size (in):** ***Mean*** ***Max*** ***Min*** ***SD***	**Length (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Width (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Height (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours soaked:** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**# fishers fishing in:** ***<3 mi*** ***>3 mi*** ***Both***	**Season gear fished** **(#) = N**
STT/STJ District	15	16	1.2 3 1 0.7 N=13	Question not asked in STT/STJ District	Nylon (15)	1.9 2.5 1.3 0.95 N=11	565 1200 80 300 N=14	n/a	32 42 12 8.8 N=15	n/a	6.9 4 10 2.0 N=12	11 2 0 N=13	Yr round (11)
STX District	3	4 3 N=3	1.3 2 1 0.6 N=3	1.3 2 1 n/a N=2	Nylon (4)	1.6 2.5 0.5 0.9 N=4	1475 2500 600 921.5 N=4	n/a	56 98 15 47.3 N=4	n/a	4.7 8 4 1.2 N=3	3 2 2 N=3	Yr round (3)
USVI	16	20	1.25 3 1 0.58 N=16		Nylon (19)	1.8 2.5 0.5 0.5 N=15	767 2500 80 609 N=18	n/a	36.8 98 12 23.2 N=19	n/a	4.7 10 4 1.2 N=15	14 4 2 N=16	Yr round (14)

[1] N = Number of responses

Table 27 (Q. 24): Summary of **ballyhoo net** information from respondents.

Location	**# of fishers sampled owning gear**	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean*** ***Max*** ***Min*** ***SD***[1]	**# of gears fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**Construction material:** **(#) = N**[2]	**Bar Mesh size (in):** **Mean** ***Max*** ***Min*** ***SD***	**Length (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Width (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Height (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours soaked:** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**# fishers fishing in:** ***<3 mi*** ***>3 mi*** ***Both***	**Season gear fished** **(#) = N**
STT/STJ District	3	3	1 1 1 N=3	Question not asked in STT/STJ District	Nylon (3)	0.875 1.25 0.5 n/a N=2	400 540 300 124.9 N=3	n/a	13.3 18 10 4.2 N=3	n/a	4.2 3 6 0.76 N=3	3 0 0	Yr round (2) High wind (1)
STX District	0												
USVI District	Gear reported only from STT/STJ District												

[1]Standard Deviation
[2]N = Number of responses

Table 28 (Q. 24): Summary of **haul seine** information from respondents.

Location	**# of fishers sampled owning gear**	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean*** ***Max*** ***Min*** ***SD***[1]	**# of gears fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**Construction material:** **(#) = N**[2]	**Bar Mesh size (in):** ***Mean*** ***Max*** ***Min*** ***SD***	**Length (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Width (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Height (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours soaked:** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**# fishers fishing in:** ***<3 mi*** ***>3 mi*** ***Both***	**Season gear fished (#) = N**
STT/STJ District	6	6[3] n/a	1 1 1 0 N=6	Question not asked in STT/STJ District	Nylon (6)	0.875 1.5 0.5 N=3	454 1080 30 433 N[G]=5	n/a	22.0 38 6 13.2 N=5	n/a	6.0 2 12 3.6 N=4	6 0 0 N=6	Yr round (5)
STX District	5	5 n/a	1 1 1 0 N=5	n/a	Nylon (4) Monofilament (1)	1.75 2.5 1 0.95 N=5	1100 2000 500 711.1 N=5	n/a	43.6 85 8 35.8 N=5	n/a	6.0 10 2 3.0 N=5	5 1 1 N=5	Yr round (4) Oct – Jan (1)
USVI District	11	11	1 1 1 0 N=6		Nylon (6) Monofilament (1)	1.5 2.5 0.25 0.7 N=8	777 2000 30 607 N=10	n/a	32.8 85 6 27.2 N=10	n/a	6.0 12 2 3.0 N=9	11 1 1 N=11	Yr round (9) Oct-Jan (1)

[1]Standard Deviation
[2]N = Number of responses
[3]Two fishers use their haul seines for catching ballyhoo

Table 29 (Q. 24): Summary of **gill net** information from respondents.

Location	**# of fishers sampled owning gear**	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean*** ***Max*** ***Min*** ***SD***[1]	**# of gears fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**Construction material:** **(#) = N**[2]	**Bar Mesh size (in):** **Mean** ***Max*** ***Min*** ***SD***	**Length (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Width (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Height (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours soaked:** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**# fishers fishing in:** ***<3 mi*** ***>3 mi*** ***Both***	**Season gear fished** **(#) = N**
STT/STJ District	4	7 -	1.4 2 1 0.6 [2]N=4	Question not asked in STT/STJ District	Nylon (4) Mono-filament (1)	1.55 2 1.25 0.33 N=5	338 480 100 151.1 N=5	n/a	10 15 6 3.9 N=5	4 3 5 N=1	4 N=1	4 1 1 N=4	Yr round (4)
STX District	35	103 63	2.9 24 1 3.9 N=35	2.2 6 1 1.4 N=29	Nylon (18) Mono – filament (21)	2.3 3.5 1.5 0.8 N=33	385.8 1200 90 229.8 N=36	n/a	6.4 12 3 2.0 N=36	3.7 8 1 1.8 N=35		32 9 6 N=35 fishers	Yr round (33) Nov-Apr (flying fish season) (1) During conch closed season (1)
USVI District	39	110 -	2.8 24 1 3.7 N=39		Nylon (22) Mono – filament (25)	2.1 3.5 1.25 0.8 N=40	380 1200 90 221 N=41	n/a	6.9 15 3 2.6 N=41	3.7 8 1 1.7 N=36		36 10 7 N=39	Yr round (37) See STX for further breakdown

[1]Standard Deviation
[2]N = Number of responses

Table 30 (Q. 24): Summary of **trammel net** information from respondents.

Location	**# of fishers sampled owning gear**	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean*** ***Max*** ***Min*** ***SD***[1]	**# of gears fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**Construction material:** **(#) = N**[2]	**Bar Mesh size (in):** **Mean** ***Max*** ***Min*** ***SD***	**Length (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Width (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Height (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours soaked:** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**# fishers fishing in:** ***<3 mi*** ***>3 mi*** ***Both***	**Season gear fished** **(#) = N**
STT/STJ District	1	1 -	1	Question not asked in STT/STJ District	Nylon (1)		120	n/a	4				
STX District	9	26 20	2.8 6 1 2.03 N=9	3.3 6 1 1.8 N=6	Nylon (23) Mono (2) Polyurethane (1)	Stretch 3.2 3.5 3 0.2 N=8	538.9 1000 200 351.6 N=9	n/a	6.0 8 4 1.7 N=9	4.5 7 3 1.6 N=7	n/a	8 5 5	Yr round (8)
USVI[3] **District**	10	27 -											

[1]Standard Deviation
[2]N = Number of responses
[3]Data from STT/STJ fishers are too few to do a USVI analysis

Table 31 (Q. 24): Summary of **cast net** information from respondents.

Location	**# of fishers sampled owning gear**	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean Max Min SD***[1]	**# of gears fished:** ***Mean Max Min SD***	**Construction material:** **(#) = N**[2]	**Bar Mesh size (in):** **Mean** ***Max Min SD***	**Length (ft):** ***Mean Max Min SD***	**Width (ft):** ***Mean Max Min SD***	**Height (ft):** ***Mean Max Min SD***	**Hours soaked:** ***Mean Max Min SD***	**Hours fished:** ***Mean Max Min SD***	**# fishers fishing in:** ***<3 mi >3 mi Both***	**Season gear fished** **(#) = N**
STT/STJ District	47	107 n/a	2.3 8 1 N=47	Question not asked in STT/STJ District	Nylon (42)	0.36 0.5 0.18 0.14 N=13	n/a	n/a	7.0 12 4 1.57 N=105	n/a	2.0 4 1 N=46	45 0 0 N=45	Yr round (46)
STX District	100	137 n/a	1.4 3 1 0.56 N=100	Most fishers fish all their gears	Nylon (35) Monofilament (91) Polyurethane (2)	0.46 2.5 0.125 0.30 N=123	n/a	n/a	9.3 12 5 2.0 N=122	n/a	1.3 8 0.5 1.2 N=99	94 2 1 N=95	Yr round (87) Conch season (1) Mullet season (1) Occasionally (4) Dolphin season (1)
USVI District	147	244	1.7 8 1 1.1 N=147		Nylon (77) Monofilament (91) Polyurethane (2)	0.45 2.5 1.25 0.28 N=135	n/a	n/a	8.3 12 4 2.1 N=233	n/a	1.5 8 0.5 1.1 N=145	139 2 1 N=140	Yr round (133) Other – see STX

[1]Standard Deviation
[2]N = Number of responses

Table 32 (Q. 24): Summary of **umbrella net** information from respondents.

Location	**# of fishers sampled owning gear**	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean*** ***Max*** ***Min*** ***SD***[1]	**# of gears fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**Construction material:** **(#) = N**[2]	**Bar Mesh size (in):** **Mean** ***Max*** ***Min*** ***SD***	**Length (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Width (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Height (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours soaked:** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**# fishers fishing in:** ***<3 mi*** ***>3 mi*** ***Both***	**Season gear fished** **(#) = N**
STT/STJ District	0												
STX District	4	4 n/a	1 1 1 N=4	n/a	Nylon (1) Monofilament (3)	0.59 0.75 0.38 N=4	n/a	n/a	7.3 8 4.5		2 3 1	4 0	Yr round (1) Oct-Feb (1) Aug-Apr (1) Robin Season (1)
USVI District	Gear reported only from STX												

[1]SD = Standard Deviation
[2] N = Number of responses

Table 33 (Q. 24): Summary of **plastic lobster pot** information from respondents

Location	**# of fishers sampled owning gear**	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean*** ***Max*** ***Min*** ***SD***[1]	**# of gears fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**Construction material:**	**Bar Mesh size (in):** **Mean** ***Max*** ***Min*** ***SD***[1]	**Length (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Width (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Height (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours soaked:** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**# fishers fishing in:** ***<3 mi*** ***>3 mi*** ***Both***	**Season gear fished** **(#) = N**[2]
STT/STJ District	10	2036	204 400 6 109.5 N=10	Question not asked in STT/STJ District	Plastic by definition		2.5 N=2	1.8 N=2	1.5 N=2	184.8 336 168 53.1 N=10	9.2 11.5 8 5.2 N=5	9 9 N=9	Yr round N=8
STX District	0												
USVI District	Gear only reported from STT/STJ District												

[1]SD = Standard Deviation
[2] N = Number of responses

Table 34 (Q. 24): Summary of **modified fish trap (pot) and deepwater shrimp trap (pot)** information from respondents.

Location	**# of fishers sampled owning gear**	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean Max Min SD***[1]	**# of gears fished:** ***Mean Max Min SD***	**Construction material:**	**Bar Mesh size (in):** **Mean** ***Max Min SD***	**Length (ft):** ***Mean Max Min SD***	**Width (ft):** ***Mean Max Min SD***	**Height (ft):** ***Mean Max Min SD***	**Hours soaked:** ***Mean Max Min SD***	**Hours fished:** ***Mean Max Min SD***	**# fishers fishing in:** ***<3 mi >3 mi Both***	**Season gear fished** **(#) = N**[2]
STT/STJ District	**28** Used to catch lobster	2719	97.1 545 5 N=28	Question not asked in STT/STJ District	Wire Wire & Rebar Plastic coated wire	2 2 2 N=23	3.75 5 3 N=12	3.25 4 1.5 N=12	1.7 4 1.5 N=12	163.9 200 72 N=28	8.2 11 5 N=11	19 21 N=25	Yr round N=27
STX District	Used to catch deepwater shrimp	25	25	25	Plastic coated wire	0.75	3	2	1.5	16 24 8	n/a	0 1	Yr round (1)
USVI[3] **District**	Data between districts is not comparable												

[1]SD = Standard Deviation
[2] N = Number of responses
[3]No USVI analysis done because the gears for the two districts are constructed for two different purposes.

Table 35 (Q. 24): Summary of **fish trap (pot)** information from respondents.

Location	**# of fishers sampled owning gear**[1]	**Total # gears:** ***Owned*** ***Fished***	**# of gears owned by fishers:** ***Mean*** ***Max*** ***Min*** ***SD***[2]	**# of gears fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**Construction material:**	**Bar Mesh size (in):** **Mean** ***Max*** ***Min*** ***SD***	**Length (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Width (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Height (ft):** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours soaked:** ***Mean*** ***Max*** ***Min*** ***SD***	**Hours fished:** ***Mean*** ***Max*** ***Min*** ***SD***	**# fishers fishing in:** ***<3 mi*** ***>3 mi*** ***Both***	**Season gear fished** **(#) = N**[3]
STT/STJ District	29	2652	91 412 2 94.0 N=29	81 130 32 56.93 N=3[4]	Coated wire & rebar Wire	2 2 2 0 N=16	4 5 3 0.5 N=16	3.5 4 3 0.5 N=16	1.5 2 1 0.2 N=16	156 170 72 40.6 N=25	7.3 11 4 2.7 N=10	22 19 15 N=26	Yr round (25)
STX District	69	1234 N=57 841 N=52	21.6 102 1 20.93 N=57	16.2 102 0 17.56 N=52	Wooden frame with chicken wire Plastic coated wire Galvanized wire Steel (rebar?) frame	1.63 2.5 1.5 0.23 N=72[5]	4.7 6 3.5 0.6 N=69	3.9 6 1.5 0.8 N=69	1.7 6 1 0.8 N=68	91.5 336 4 56.4 N=62	n/a	65 2 5 N=68	Yr round (55)
USVI District	98	3886	45.1 412 1 65.6 N=86	19.7 412 0 24.4 N=55		1.7 2.5 1.5 0.25 N=89	4.5 6 3 0.638 N=85	3.84 6 1.5 0.77 85	1.69 6 1 0.72 N=84	109.9 412 4 57.4 N=87		87 21 20 N=94	Yr round (80)

[1]Licensed fishers who reported that they trap fish in the BVI, also did not report the number of traps that they have in the BVI so are not included in the above table.
[2]SD = Standard Deviation
[3] N = Number of responses
[4]The number of responses is low because this question was not specifically asked in STT/STJ District.
[5]Three fishers used either of two different mesh sizes when constructing their fish traps.

Table 36 (Q. 24): Summary of **surface longline** information from respondents.

		# of fishers fishing in territorial (<3 mi) or federal (>3 mi) waters or both (< and > 3 mi)			Season used			# gears owned	# gears fished	Length (ft)	# hooks	Hrs fished
Location	**# Fishers**	**Use > 3 miles**	**Use <3 miles**	**Both**	**Yr round**	**Other**						
St. Thomas/ St. John District	1	1	0	0	1	0	**Total**	8	n/a			
							Mean	8		1200	30	10
							Range	8		1200	30	10
							N[1]	1		1	1	1
St. Croix District	2	2	0	0	2	0	**Total**	2	0			
							Mean	1		30 mi	400	20
							Range	1		10-50 mi	300-500	20
							N	2		2	2	1
USVI	3	3	0	0	3	0	**Total**	10				
							Mean	3.3				
							Range	1-8		1200 ft – 50 mi	30 - 500	10-20
							N	3				

[1]N = number of fishers responding.

***Table 37 (Q.24)*:** Summary of **bottom longline** information from respondents.

		# of fishers fishing in territorial (<3 mi) or federal (>3 mi) waters or both (< and > 3 mi)			Season fished			# gears owned	# gears fished	# of lines/ boat	Length (ft)	# hooks	Hrs fished
Location	**# Fishers**	**Use <3 miles**	**Use > 3 miles**	**Both**	**Yr round**	**Other**							
St. Thomas/ St. John District	1	1	1	1	1	0	**Total**	2	n/a				
							Mean	2		n/a	300	100	n/a
							Range	2			300	100	
							N[1]	1			1	1	
St. Croix District	3	1	2		2	0	**Total**	20	n/a				
							Mean	6.7		6	1100	39	10
							Range	3-10		5-7	1000-1200[2]	10-70 (40.8)	8-12 (2)
							N	3		1	3	3	3
USVI	4	2	3	1	3	0	**Total**	22					
							Mean	5.5			1027	50	
							Range	2-10			300-1200 (400)	10-100 (38.2)	
							N	4			4	4	

[1]N = number of fishers responding.

[2]The mean depth of deployment for all fishers is 1100 feet. One bottom longline fisher uses a "hooker tracker," described as a weighted scaffold with 70 hooks attached, at depths between 1000-1200 feet.

Table 38 (Q.24): Summary of **vertical setline – multi-hook** information from respondents.

		# of fishers fishing in territorial (<3 mi) or federal (>3 mi) waters or both (< and > 3 mi)			Season used			# gears owned	# of lines/ boat	Length (ft)	# hooks	Hrs fished	Hrs soaked
Location	**# Fishers**	**Use <3 miles**	**Use > 3 miles**	**Both**	**Yr round**	**Other**							
St. Thomas/ St. John District	3	1	4	1	4	0	**Total**	11	n/a				
							Mean	3.67		1500	50	11	1.5
							Range (SD)	1-7		1500	25-75 (25.0)	10-12	1-2
							N	3		2	3	2	1
St. Croix District	65	45	55	34	63	Jul-Aug (1)	**Total**	340					
							Mean	5.2	3.3	1230	12.4	7.2	n/a
							Range (SD)	1-30 (4.7)	1-6 (1.61)	150-2000 (451.0)	3-32 (7.1)	2-14 (2.23)	
							N	65	23	51	65	64	
USVI	68	46	59	35	67	See above	**Total**	361					
							Mean	5.2		1318	14.0	7.3	
							Range (SD)	1-30		150-2000 (446.5)	3-75 (11.3)	2-14 (2.3)	
							N	68		53	68	66	

N = number of fishers responding, SD = standard deviation

***Table 39 (Q. 24)*:** Summary of **vertical setline – single hook** information from respondents.

		# of fishers fishing in territorial (<3 mi) or federal (>3 mi) waters or both (< and > 3 mi))			Season used			# gears owned	# of lines/ boat	Length (ft)	# hooks	Hrs fished
Location	**# Fishers**	**Use <3 miles**	**Use > 3 miles**	**Both**	**Yr round**	**Other**						
St. Thomas/ St. John District	1	1	1	1	1	0	**Total**	5				
							Mean	5		100	1	n/a
							Range (SD)	5		100		
							N	1		1		
St. Croix District	10	9	6	5	7	Sept – Jan (1) Sept-Oct (1) Oct-Feb (1)	**Total**	35				
							Mean	3.5	2.9	812.5	1	6.5
							Range (SD)	2-5 (1.3)	2-5	700-1000		2-12 (2.0)
							N	10	10	# gear - 8 # fishers - 2		10
USVI	11	10	7	6	8	See above	**Total**	40				
							Mean	3.6				
							Range (SD)	2-5 (1.3)				
							N	11				

N = number of fishers responding, SD = standard deviation

Table 40 (Q.24): Summary of **trolling gear** information from respondents (R&R = Rod & Reel, HL = Hand line).

Location	# Fishers	# of fishers using gear		# of fishers fishing in territorial (<3 mi) or federal (>3 mi) waters or both (< and > 3 mi)			Season used			# gears owned/fisher		# of lines/ boat	# hooks	Hrs fished
		R&R	HL	Use <3 miles	Use > 3 miles	Both	Yr round	Other		R&R	HL			
St. Thomas/ St. John District	30	24	12	23	21	15	22	Winter/ Spring(1) Summer (1)	**Total[1]**	115	11		29	
									Mean	5.5	2.2		1.07	6.8
									Range (SD[2])	1-20 (5.1)	1-4 (1.3)	5	1-2 (0.3)	2-15 (3.2)
									N[3]	21	5	1	27	27
St. Croix District	88	32	70	68	71	52	76	Dolphin season (2) Tuna season (1) Opportunistic (2) Sept-Oct (1) Sept-Nov (1) Oct-Apr (1)	**Total**	119	340		133	
									Mean	5.2	6.2	2.3	1.5	4.6
									Range (SD)	1-12 (3.4)	1-30 6.0)	1-9 (1.4)	1-10 (1.5)	0.5-13 (2.8)
									N	23	55	84	86	86
USVI	118	56	82	91	92	67	98	See above	**Total**	234	351		162	
									Mean	5.3	5.8	2.3	1.4	5.1
									Range (SD)	1-20 (4.2)	1-30 (5.8)	1-9 (1.4)	1-10 (1.3)	0.5-15 (3.0)
									N	44	60	84	113	113

[1]The totals are an underestimate because 1) not all fisher were interviewed in St. Thomas/St. John District and 2) because some of fishers did not provide numbers of gear or did not break down the numbers of gear into R&R and HL.
[2]SD = Standard Deviation
[3] N = Number of fishers responding

Table 41 (Q. 24): Summary of **anchor fishing gear** information from respondents (R&R = Rod & Reel, HL = Hand line).

Location	# Fishers	# of fishers using gear		# of fishers fishing in territorial (<3 mi) or federal (>3 mi) waters or both (< and > 3 mi)			Season used			# gears owned/fisher		# of lines/ boat	# hooks	Hrs fished
		R&R	HL	Use <3 miles	Use > 3 miles	Both	Yr round	Other		R&R	HL			
St. Thomas/ St. John District	66	3	65	55	43	34	59	Winter/spring (1)	**Total[1]**	4	98		81	
									Mean	2	6.1	2	1.3	7.2[2]
									Range (SD[3])	1-3	1-20 (5.4)		1-6 (0.8)	3-14 (2.7)
									N[4]	2	16	1	64	63
St. Croix District	128	3	127	114	55	44	120	During conch season (1) Nov-Apr (1)	**Total**	9	948		325	
									Mean	4.5	7.9	3.1	2.6	5.8
									Range (SD)	3-6 (2.1)	1-40 (6.7)	1-15 (1.9)	1-11 (2.0)	1-18 (2.2)
									N	2	120	116	125	124
USVI	194	6	192	169	98	78	179		**Total**	13	1046		406	
									Mean	3.3	7.7	3.0	2.2	6.5
									Range (SD)	1-6 (2.1)	1-40 (6.6)	1-15 (1.9)	1-11 (1.8)	1-60 (4.6)
									N	4	136	117	189	188

[1]The totals are total numbers of gear reported. The totals are an underestimate because 1) not all fisher were interviewed in St. Thomas/St. John District and 2) because some of fishers did not provide numbers of gear or did not break down the numbers of gear into R&R and HL.
[2]One fisher reported fishing 60 hrs when anchor fishing. This data was omitted.
[3]SD = Standard Deviation
[4] N = Number of fishers responding.

Table 42 (Q. 24): Summary of **drift fishing gear** information from respondents (R&R = Rod & Reel, HL = Hand line).

Location	# Fishers	# of fishers using gear		# of fishers fishing in territorial (<3 mi) or federal (>3 mi) waters or both (< and > 3 mi)			Season used			# gears owned/fisher		# of lines/ boat	# hooks	Hrs fished
		R&R	HL	Use <3 miles	Use > 3 miles	Both	Yr round	Other		R&R	HL			
St. Thomas/ St. John District	29	2	28	19	21	9	25	0	**Total[1]**	14	37		53	
									Mean	7	6.7		1.8	10.4
									Range (SD[2])	1-13	1-20 (7.0)	1	1-4 (1.0)	4-84 (15.0)
									N[3]	2	7	1	29	27
St. Croix District	62	4	60	45	44	28	57	Late Winter (1) Sept-Oct (1) Sept-Nov (1) Sept-Jan (1)	**Total**	16	429		174	
									Mean	3.2	8.9	3	2.8	6.0
									Range (SD)	1-6 (2.2)	1-40 (8.0)	1-15 (2.4)	1-20 (3.8)	0.5-18 (3.0)
									N	5	48	60	61	60
USVI	91	6	88	64	65	37	82	See above	**Total**	30	466		227	
									Mean	4.3	8.6	3	2.5	7.4
									Range (SD)	1-13 (4.3)	1-40 (7.9)	1-15 (2.4)	1-20 (3.2)	0.5-84 (8.9)
									N[f]	7	54	61	90	87

[1]The totals are total numbers of gear reported. The totals are an underestimate because 1) not all fisher were interviewed in St. Thomas/St. John District and 2) because some of fishers did not provide numbers of gear or did not break down the numbers of gear into R&R and HL.
[2]SD = Standard Deviation
[3] N = Number of fishers responding

Table 43 (Q. 24): Summary of **skin diving gear** information from respondents.

Location	# Fishers	# of fishers skin diving with various types of gear					# of fishers fishing in territorial (<3 mi) or federal (>3 mi) waters or both (< and > 3 mi)[1]			Season fished (# of fishers)			# of each gear type owned by fishers			
		By hand	Net	Snare	Gaff	Spear	Use <3 miles	Use > 3 miles	Both	Yr round	Other		Snare	Gaff	Spear	Hrs fished
St. Thomas/ St. John District	15	10	1	5	1	2	14	2	2	10	Winter (1) Conch Season (1)	**Total[2]**	9	1	3	
												Mean	2.3	1	1.5	6
												Range (SD[3])	1-3 (1.0)		1-2	
												N[4]	4	1	2	1
St. Croix District	40	37	2	36	6	33	40	3	3	33	Conch Season (3) Outside Dolphin season (1) Calm weather (1)	**Total**	77	12	53	
												Mean	2.3	1.9	1.7	4.1
												Range (SD)	1-8 (1.6)	1-4 (0.9)	1-4 (0.8)	1-9 (1.6)
												N	34	6	31	38
USVI	55	47	3	41	7	35	54	5	5	43			86	13	56	
												Mean	2.3	1.8	1.7	4.2
												Range (SD)	1-8 (1.5)	1-4 (0.9)	1-4 (0.8)	1-9 (1.7)
												N	38	7	33	39

[1]Only 14 of 15 skin diving fishers in St. Thomas/St. John District responded to this question

[2]The totals are the total numbers of gear reported. The totals are an underestimate because 1) not all fisher were interviewed in St. Thomas/St. John District and 2) because some of fishers responded yes or no to the question.

[3]SD = Standard Deviation

[4] N = Number of fishers responding

Table 44 (Q. 24): Summary of **scuba diving gear** information from respondents.

Location	# Fishers	# of fishers skin diving with various types of gear					# of fishers fishing in territorial (<3 mi) or federal (>3 mi) waters or both (< and > 3 mi)[1]			Season used (# of fishers)			# of each gear type owned fishers				
		By hand	Net	Snare	Gaff	Spear	Use <3 miles	Use > 3 miles	Both	Yr round	Other		Snare	Gaff	Spear	Scuba Tanks	Hrs fished
St. Thomas/ St. John District	11	4	0	7	1	4	10	5	5	9		**Total**[2]	24	1	6	38	
												Mean	3.9	1	1.5	4.7	4
												Range (SD[3]**)**	1-15 (4.4)		1-4 (0.6)	2-12 (3.6)	
												N[4]	6	1	4	8	1
St. Croix District	83	52	17	76	3	71	80	41	39	80	Jack Season (1)	**Total**	140	5	112	452	
												Mean	2.0	1.7	1.8	6.4	4.7
												Range (SD)	1-6 (0.9)	1-2 (0.6)	1-4 (0.8)	2-16 (2.9)	1-9 (1.5)
												N	69	3	64	71	77
USVI	94	56	17	83	4	75	90	46	44	90		**Total**	164	6	118	490	
												Mean	2.2	1.5	1.7	6.2	4.7
												Range	1-15 (1.5)	1-2 (0.6)	1-4 (0.7)	2-16 (3.0)	1-9 (1.5)
												N	75	4	68	79	78

[1]Only 9 of 11 skin diving fishers in STT/STJ District responded to this question

[2]The totals are the total numbers of gear reported. The totals are an underestimate because 1) not all fisher were interviewed in STT/STJ District and 2) because some of fishers responded yes or no to the question.

[3]SD = Standard Deviation

[4] N = Number of fishers responding

Question 25: How often do you fish? _____ trips per week.

Fishers in STX District fished an average of 3.3 trips per week (Table 45, Fig. 5) compared with an average of only 2.6 trips per week for STT/STJ District fishers.

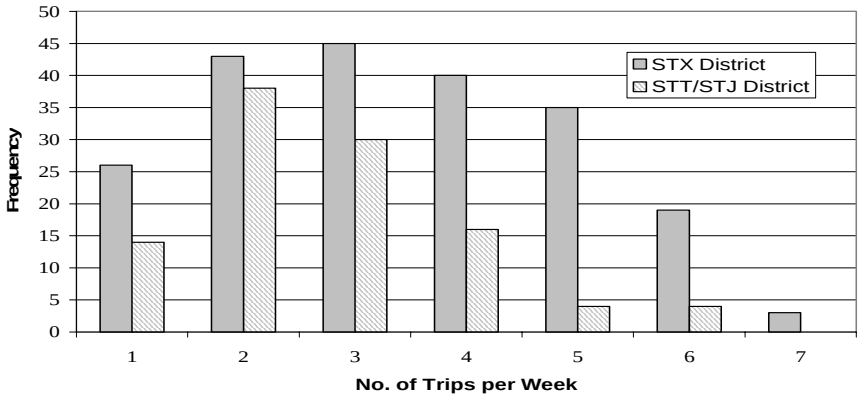
Question 26: How long are your commercial fishing trips? _____ hours/trip.

Trip duration was on average 1.5 hours longer in STT/STJ District than in STX District (Table 44) while the number of trips per week was higher in STX District than in STT/STJ District (Table 44, Fig. 5). In other words, STT/STJ District fishers went on fewer but longer trips than STX District fishers.

Table 45 (Q. 25 & 26): The average number of fishing trips by fishers per week and the average duration of fishing trips in the US Virgin Islands.

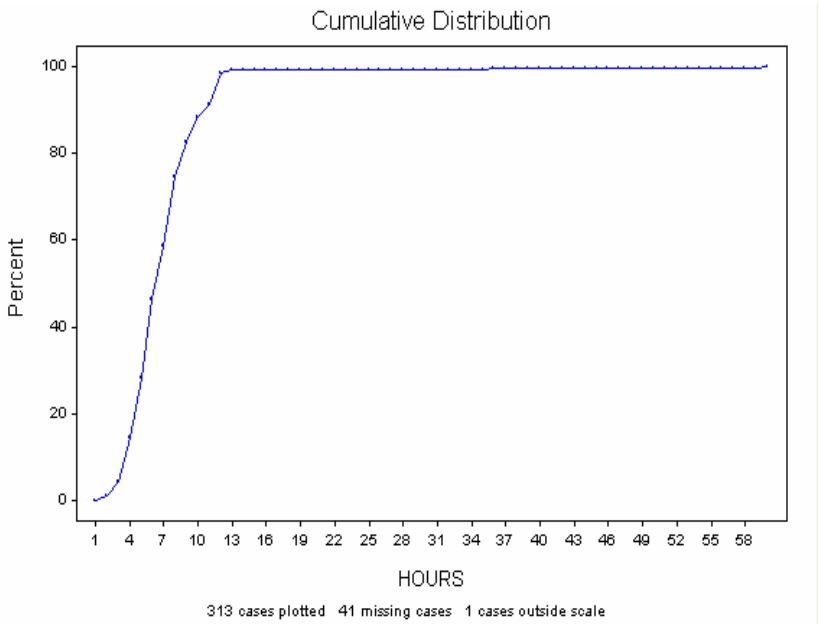
	St. Thomas/St. John District		**St. Croix District**		**USVI**	
	Trips per week	**Trip duration (hrs)**	**Trips per week**	**Trip duration (hrs)**	**Trips per week**	**Trip duration (hrs)**
Mean	2.6	8.3	3.3	6.7	3.1	7.2
Range	0.2 - 7	2-60	0.25 - 7	1-13	0.2 - 7	1-60
Standard Deviation	1.2	6.4	1.6	2.4	1.5	4.2
Number of responses	106	103	211	211	317	314

Figure 5 (Q. 31): Number of trips per week for STT/STJ (N = 106) and STX (N = 211) District commercial fishers.



Fishing in the USVI was generally a day operation with approximately eighty percent (80%) of fishing trips in the USVI less than 9 hours (Fig. 6). Only two fishers reported going out on overnight trips. Both these fishers were from STT/STJ District (Table 45).

Figure 6 (Q. 26): Cumulative distribution of the hours per fishing trip for the US Virgin Islands.



Question 27: How many people commercially fish with you? [ ] fish alone [ ] with ____helpers [ ] with ____other commercial fishers.

Fishers in both districts usually went out with one helper and occasionally with a second helper (Tables 46 & 47). This is especially true in STX District where 89% of fishers fished with at least one helper (Table 46). In STT/STJ District approximately twice as many fishers fished alone (17%) or with other commercial fishers (29.2%) compared with STX (7.1% and 10.4%, respectively).

Table 46 (Q. 27): Number of fishers fishing alone, with helpers, or with other commercial fishers.

	St. Thomas/St. John District		St. Croix District		USVI	
# of commercial fishers who:	**# of Fishers**	**Percent**	**# of Fishers**	**Percent**	**# of Fishers**	**Percent**
Fish alone	18	17.0%	15	7.1%	33	10.4%
Fish with helpers	**63**	**59.4%**	**188**	**89.0%**	**251**	**79.1%**
Fish with other commercial fishers	31	29.2%	22	10.4%	53	16.7%
Number of respondents*	106	105.60%	211	106.50%	317	106.20%

*Some fishers indicated that they fished in more than one way, e.g. at different times they might fish alone or with helpers, or with commercial fishers. Therefore, the total percentage is greater than 100%.

Table 47 (Q. 27): The number of crew used by commercial fishers in the US Virgin Islands.

	St. Thomas/St. John District		St. Croix District		USVI	
	# helpers/ fisher	**# of commercial fishers/fisher**	**# helpers/ fisher**	**# of commercial fishers/ fisher**	**# helpers/ fisher**	**# of commercial fishers/ fisher**
Mean	1.3	1.2	1.4	1.4	1.4	1.3
Range	1-4	1-2	1-12	1-3	1-12	1-3
Standard Deviation	0.6	0.4	1.2	0.6	1.1	0.5
Number of responses	63	31	188	22	53	251

Question 28: How many hours per week do you spend on: (a) fixing your boat ___hrs/week (b) repairing fishing gear/preparations _____hrs/week (c) fish sales _____ hrs/week.

Fishers in the USVI spent a considerable amount of time carrying out non-fishing, trade related activities during the week. On both islands, fishers spent nearly a day a week selling their fish (Table 48). STT/STJ District fishers spent about 1.5 hrs more a week selling their fish than STX District fishers. Both fishing groups spent about 3 hours a week fixing their boats and a half day a week fixing their gear (Table 48). The high standard deviations (in excess of the mean) indicated that there is considerable variation among fishers in the amount of time spent in these activities.

Table 48 (Q. 28): The hours per week commercial fishers in the US Virgin Islands spent on fishing related activities (not including catching fish).

Activity	St. Thomas/St. John District			St. Croix District			USVI		
	Hrs selling fish	**Hrs fixing boat**	**Hrs fixing gear**	**Hrs selling fish**	**Hrs fixing boat**	**Hrs fixing gear**	**Hrs selling fish**	**Hrs fixing boat**	**Hrs fixing gear**
Mean	8.1	2.9	4.3	6.6	3.3	4.0	8	3.2	4.1
Range	0-30	0-20	0-40	0-40	0-24	0-24	0-40	0-24	0-40
SD	7.1	3.4	6.0	6.9	3.0	4.3	7.0	3.1	4.9
No. of responses	88	95	97	206	205	208	294	300	305

Questions 29: Where do you land your fish?

St. John fishers reported landing their fish at one of four specific landing sites (Table 49). One St. John (STJ) fisher trailered his boat.

Table 49 (Q. 29): Names of landing sites used by St. John commercial fishers and the percentage of fishers responding who used each of the landing sites

St. John landing sites	Number of fishers using site	Percent of fishers using site
Cruz Bay	**5**	**45.5%**
Coral Bay	**4**	**36.4%**
STJ	1	9.1%
Hansen Bay	1	9.1%
Trailered	1	9.1%
Number of respondents	11	109.20%
Total # of responses	12	

St. Thomas fishers reported that they landed their fish at 19 different sites on the north, south and east end of the island, two sites on STJ and one site on STX (Table 50). One STT fisher trailered his boat. The three most common landing sites, Frenchtown, Hull Bay and Benner Bay (including Sea Side Inn, located in Benner Bay) were used by 64.9% of fishers. Only five STT fishers indicated that they landed their fish at more than one location.

Table 50 (Q. 29): Names of landing sites used by St. Thomas commercial fishers and the percentage of fishers responding who used each of the landing sites.

St. Thomas Landing sites	Number of fishers using site	Percent of fishers using site
Frenchtown	**31**	**33.0%**
Hull Bay	**15**	**16.0%**
Benner Bay	**8**	**8.5%**
Seaside Inn, Benner Bay	**7**	**7.4%**
Water Bay	8	8.5%
Krum Bay	6	6.4%
Mandahl Pond	3	3.2%
Red Hook	3	3.2%
Coast Guard Dock	2	2.1%
Brewers Bay	2	2.1%
East Gregorie Channel	2	1.1%
Trailered	1	2.1%
Sapphire	1	1.1%
AYH	1	1.1%
Tropical Marine	1	1.1%
Fish Hawk Marina	1	1.1%
Piccola Marina Dock	1	1.1%
Coki Point	1	1.1%
Magens Bay	1	1.1%
Crown Bay Marina	1	1.1%
Cruz Bay, St. John	1	1.1%
Kill Bay, St. John	1	1.1%
Cuelebra, Puerto Rico	1	1.1%
Total # of respondents	94	105.70%
Total # of responses	99	

St. Croix fishers reported landing their fish at 18 different sites on STX and one STX fisher reported landing fish on STJ (Table 50). The most important landing sites on STX were: Altona Lagoon in Christiansted, Molasses Pier and Frederiksted Fish Market. About a third of STX fishers landed their catches at each of these sites.). Sixty nine STX fishers (34.5%) landed their fish at more than one site (Table 52).

Table 51 (Q. 29): Names of landing sites used by St. Croix commercial fishers and the percentage of fishers responding who used each of the landing sites.

St. Croix Landing sites	Number of fishers using site	Percent of fishers using site
Altona Lagoon	**75**	**37.5%**
Molasses Pier	**71**	**35.5%**
Frederiksted Fisherman's Pier	**62**	**31.0%**
Gallows Bay	17	8.5%
Castle Nugent	11	5.5%
Salt River Bay	11	5.5%
Christiansted	9	4.5%
Teague Bay	6	3.0%
Green Cay Marina	4	2.0%
Solitude	4	2.0%
Turner Hole	3	1.5%
Duggans Reef	2	1.0%
Great Pond	2	1.0%
All Landing Sites	1	0.5%
Cane Bay	1	0.5%
Carlton Beach	1	0.5%
Chabert Beach	1	0.5%
Halfpenny Bay	1	0.5%
St. Croix Marine	1	0.5%
STJ	1	0.5%
STX	1	0.5%
Total # of respondents	200	142.50%
Total # of responses	285	

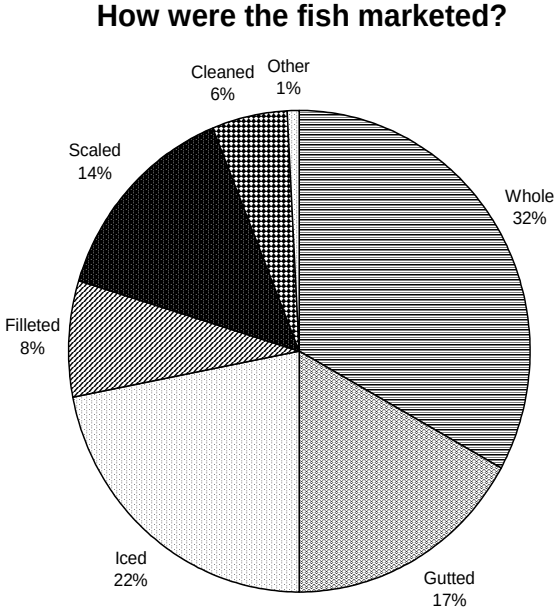
Table 52 (Q. 29): The number of landing sites used by individual St. Croix commercial fishers.

Number of landing sites reported by fisher	Number of fishers	Percent of fishers
1	**131**	**65.5%**
2	53	26.5%
3	14	7.0%
4	2	1.0%
Total # of responses	200	100.00%

Question 30: How do you market your fish? [ ] whole [ ] gutted [ ] iced [ ] filleted [ ] scaled [ ] cleaned (gutted & scaled) [ ] other (specify): _____

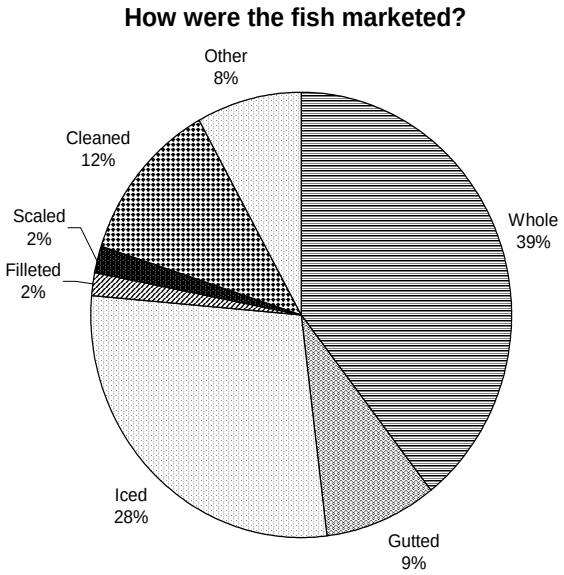
In both districts the greatest percentage of fish was marketed as whole fish followed by iced fish (this is fish that is presented to customers in coolers filled with ice) (Figs. 7 and 8). The STT/STJ District fishers primarily marketed their fish whole, gutted, or scaled (Fig. 7). In STX District fishers marketed their fish in a similar manner, primarily whole, cleaned (scaled and gutted), or gutted (Fig. 8). A similar proportion of fishers in both districts iced their fish: 22% in STT/STJ District (Fig. 7) and 28% in STX District (Fig. 8). Under "other" one fisher in STT/STJ District indicated that he sold a portion of his catch salted. In STX District fishers indicated under "other" that they sold conch cleaned (meaning out of shell and gutted) and lobster whole. Some fishers also stated that they sold their fish gilled, gutted and/or steaked. One fisher stated he left the gills on the fish to show freshness and five fishers said they did not sell their fish, two expressly stating that they only caught fish for personal use.

Figure 7 (Q. 30): Percentage of fishers marketing their fish in various ways for St. Thomas/St. John District, US Virgin Islands.



Number of fishers responding = 88

Figure 8 (Q. 30): Percentage of fishers marketing their fish in various ways in St. Croix District, US Virgin Islands.

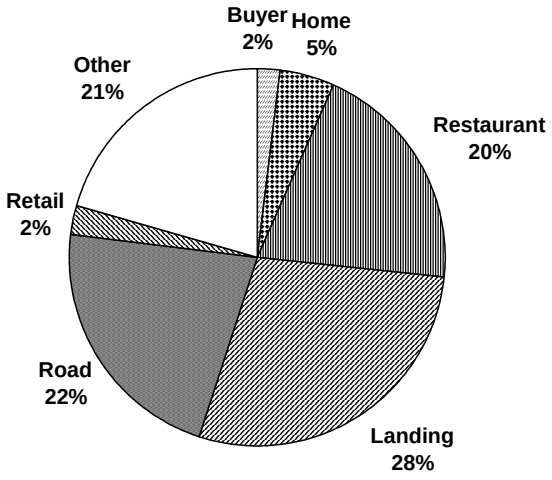


Number of fishers responding = 206

Questions 31: Where do you sell your fish? [ ] fishing association [ ] private fish company [ ] buyer [ ] at home [ ] restaurant [ ] landing site [ ] along the road [ ] retail market [ ] other (specify): _____

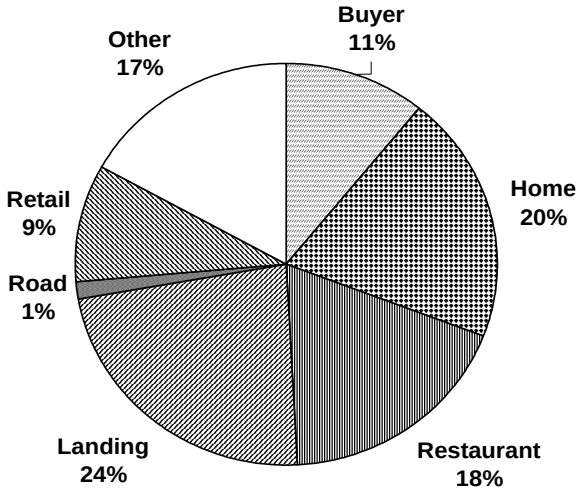
Most fishers in both STT/STJ District and STX District (Figs. 10 & 11) sold their fish at the site where they landed their fish. In STT/STJ District, of the fishers who specified "other", 62% sold their fish to special customers. Most of the remaining "other" locations (36%) were areas where fish markets, both formal and informal, have been established (Fort Mylner, Coki Point, Charlotte Amalie Waterfront, Smith Bay, the Ballpark, Market Square, Cruz Bay). One person stated that they usually gave away the fish that they caught. A number of other sales locations were listed by STX fishers. The most common "other" location on STX was the mid-island Government Fish Market where 17.3% of fishers specified that they sold their fish (Table 53).

Fig. 10 (Q. 31): Percentage of St Thomas/St. John District fishers selling their catch to various organizations or entities.



Total number of responses = 213.

Fig. 11 (Q. 31): Percentage of St Croix District fishers selling their catch to various organizations or entities.



Total number of responses = 417

Table 53 (Q. 31): Sites specified by St. Croix District commercial fishers when describing "other" sales locations. There were no multiple responses.

Locations fish sold	N	Percent of "other" responses	Percent of fishers
Government Fish Market	40	59.7%	17.3%
Private Customers	10	14.9%	4.7%
Wholesale	3	4.5%	1.3%
Hotel	1	1.5%	<1%
Do not sell	8	11.9%	3.8%
Vendor	2	3.0%	1%
Supermarket	2	3.0%	1%
Coop	1	1.5%	<1%
Total # of responses	67	100.00%	

Question 32: Compared with 10 years ago is fishing better, same or worse.

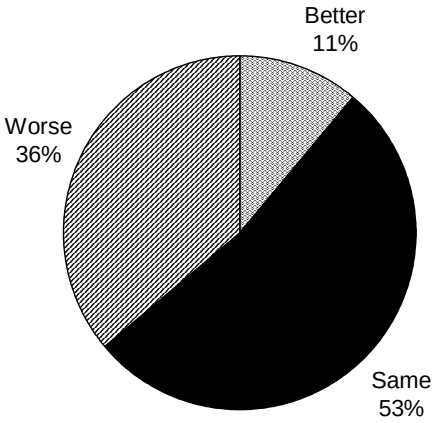
Over half the STT/STJ District fishers who responded to this question felt the fishery was the same as 10 years ago (Fig. 9), while two-thirds (141) of STX District fishers who responded to this question felt fishing is worse today than 10 years ago (Table 54, Fig. 10). Two fishers in STX District had more than one response to this question, indicating in one case that pelagic fishing was the same but inshore fishing was worse owing to overfishing and in the other case that fishing was better because more fish were being caught, but the fisher anticipated that fishing would be worse in the near future because trap fishers had changed to using gill nets.

Table 54 (Q. 32): US Virgin Islands fishers' opinions on whether fishing is better, the same, or worse than 10 years ago.

Fisher Opinions	St. Thomas/St. John District		St. Croix District		USVI	
	*N	%	N	%	N	%
Better	11	11%	4	1.9%	15	4.9%
Same	**53**	**53%**	63	30.3%	116	37.7%
Worse	36	36%	**141**	**67.8%**	**177**	**57.4%**
Total	100	100.00%	208	100.00%	308	100.00%

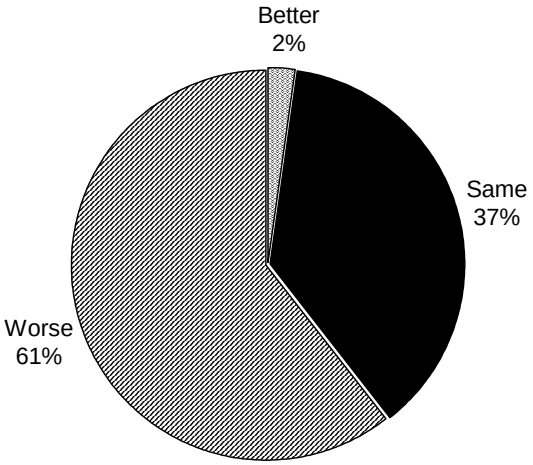
*N = number of fishers who responded to this question.

Figure 9 (Q. 32): St. Thomas/St. John District fisher responses comparing fishing today with 10 years ago.



Number of respondents = 100

Figure 10 (Q. 32): St. Croix District fisher responses comparing fishing today with 10 years ago.



Number of respondents = 208

Question 33: If you answered "worse" to the above question (Question 32)**, why is fishing worse?**

St. Thomas/St. John District:

A break down of STT/STJ District fisher responses to this question is provided in Table 55. Of the thirty six fishers who stated that fishing was worse, one third stated that this was because of less fish and nearly 20% because of area closures (Table 55). Unlike STX District fishers, STT/STJ District fishers did not report that net fishing contributed to declines in the fishery.

Table 55 (Q. 33): Reasons fishers gave for fishing being worse in St. Thomas/St. John District.

Fisher Responses	N*	Percent of fishers**
Less fish ▪ Less baitfish available ▪ Less fish ▪ Catching less	**12**	**33.3%**
Area closure ▪ Less fishing ground, have to go out further ▪ National Park ▪ Taking away best fishing grounds	7	19.4%
Too many traps	5	13.9%
Overfishing ▪ Overfishing ▪ Too much fishing pressure ▪ Area overfished	4	11.1%
Too many fishers	3	8.3%
Difficulty selling fish ▪ Sales down ▪ Fewer sales	3	8.3%
Pollution ▪ Pollution from development kills reef ▪ Pollution in general	3	8.3%
Hurricane damage to reefs ▪ Natural disasters ▪ Weather	3	8.3%
Fish trap theft and tampering	2	5.6%
Longliners	2	5.6%
Habitat Destruction	1	2.8%
More regulations	1	2.8%
BVI rules	1	2.8%
Larger mesh required on traps	1	2.8%
Higher fuel costs	1	2.8%
No. of respondents	36	136.10%
No. or responses	49	

* N = number of respondents. Most respondents gave more than one reason.

** The number of responses in each category were divided by the number of fishers who indicated that fishing was worse, therefore, the total adds up to more than 100%.

St. Croix District:

STX District fishers who thought fishing was worse today than 10 years ago provided twenty reasons for the decline (Table 56). Over half (53.4%) stated that it was due to four factors: net fishing, too many fishers, less fish and overfishing (Table 55).

Table 56 (Q. 33): Reasons fishers gave for fishing being worse in St. Croix District.

Fisher Responses	N*	Percent of fishers**
Net fishers take too many fish ▪ Too many fishermen with nets, they dump (throw away) the small fish ▪ Too much new equipment like nets ▪ Too many net fishers taking most of the fish ▪ Over fishing by gill nets ▪ Too many gill and trammel nets ▪ Gill nets catching too many fish ▪ Gill nets need to be regulated or eliminated ▪ Over fishing due to gill nets ▪ Haul seines remove too many fish, fish spoiled on shore ▪ Gill nets need to be monitored on a daily basis ▪ Gill nets kill juvenile fish ▪ Gill nets abusing fisheries ▪ Gill nets doing a lot of damage ▪ Divers with gill nets ▪ Change in fishing methods (example: trap fishers now use gillnets) ▪ Larger jack nets have taken all the fish ▪ Too many gill nets catch everything	55	**38.9%**
Too many fishers ▪ Too many fishers, need closed season ▪ Too many trap fishers ▪ Too many divers and fishers now ▪ Greater number of fishers ▪ Too many fishers fishing out the fishery ▪ More trap fishers ▪ Fish are scarce because of too many fishermen	46	32.9%
Less fish ▪ Same in deepwater but worse inshore ▪ Less baitfish available ▪ Decrease in lobsters and pelagic fish ▪ Dredging of Altona Lagoon caused decrease catch ▪ Catch not as good but doesn't know why	37	25.9%

Overfishing	15	10.5%
Pollution ▪ Pollution on south side of island ▪ Poor water quality ▪ Pollution in general	15	10.5%
Hurricane damage to reefs ▪ Reefs aren't healthy – no staghorn corals ▪ Bottom of sea is different now ▪ Reef destroyed by nature, not many caves now	9	6.3%
Area closure ▪ Too much area closed ▪ Buck Island closure ▪ New regulations limiting our fishing	14	9.8%
Longliners ▪ Longliners are hammering offshore stocks before they get into USVI waters ▪ Foreign longliners	7	4.9%
Difficulty selling fish ▪ Can't sell fish, people don't want to buy, no money ▪ Too much competition from other fishers, reduced prices to sell fish ▪ Market selling different prices, too much competition ▪ Difficult to sell fish at market – can take 2-3 days to sell catch ▪ More difficult to sell ▪ Too many fishers, sales were better 10 years ago	6	4.2%
Competition with other fishers or with foreign vessels	5	3.5%
Illegal fishing	5	3.5%
Fish trap theft and illegal hauling of traps	4	2.8%
Not enough FADs	3	2.1%
More gear being used today	2	1.4%
Reef unhealthy	1	0.7%
Not enough shelf area	1	0.7%
Net fishers on St. Martin	1	0.7%
Ghost traps	1	0.7%
Fuel costs	1	0.7%
More boat ramps needed	1	0.7%
Total number of respondents	141	161.40%
Total number of responses	229	

*N = number of respondents. Most respondents gave more than one reason.

**The number of responses in each category was divided by the number of respondents who indicated that fishing was worse, therefore, the total adds up to more than 100%.

Question 34: What percentage of your income comes from commercial fishing?

In the USVI, an average of nearly 65% of commercial fishers' income was derived from fishing (Table 57). A higher proportion of the income from commercial fishers in STT/STJ District was derived from fishing (74%) than in STX District (64.5%). Approximately three quarters of STT/STJ District fishers (Fig. 11) and one half of the STX District fishers (Fig. 12) relied on fishing for more than half their income. Nearly twice as many licensed commercial fishers on STX District derived less than a quarter of their income from fishing.

Table 57 (Q. 34): Percentage of US Virgin Islands commercial fisher income derived from fishing.

	St. Thomas/St. John District	St. Croix District	USVI
Mean	74.0%	60.2%	64.5%
Range	0-100%	0-100%	0-100%
Standard deviation	39.8	40.7	40.9
Number of responses	92	213	305

Figure 11 (Q. 34). Percentage of income from commercial fishing in St. Thomas/St. John District (N=92).

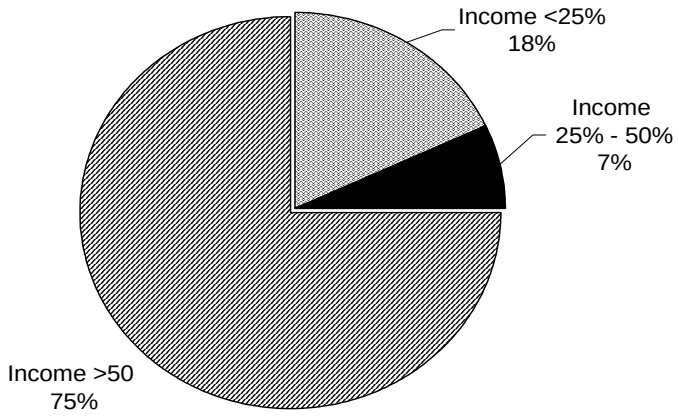
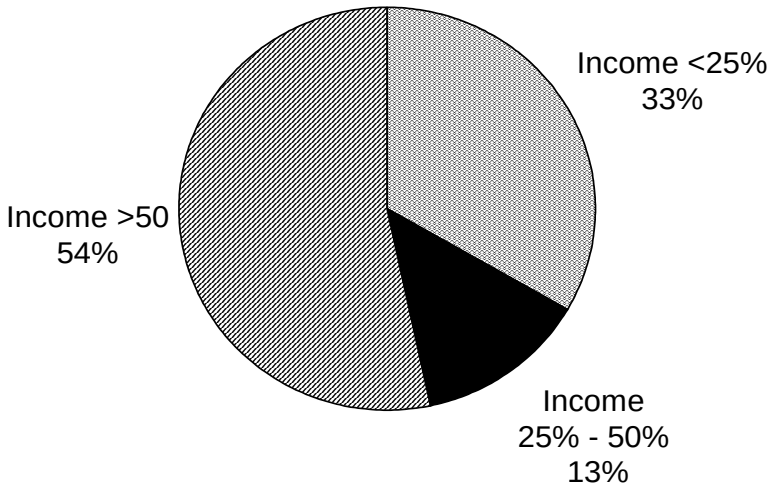


Figure 12 (Q. 34). Percentage of income from commercial fishing in St. Croix District (N=213).



DISCUSSION

In 1930, the population of the USVI was 22,012 and fishing provided a livelihood to about 2% of the population (Table 58) (Fiedler and Jarvis, 1932)(Table 58). In 1968, when the second major survey of fishers throughout the USVI was conducted, the population of the USVI was 55,000 and had more than doubled, but the number of fishers remained nearly the same (Swingle et al. 1970). As a percentage of the total USVI population, the number of fishers declined nearly 60% (Table 58) (Swingle et al. 1970). In this survey, the number of licensed commercial fishers again remained stable despite a doubling of the USVI population, and, again, the number of fishers as a percentage of the population declined 60% (Table 58).

Table: 58: Comparison of the number of commercial fishers in the US Virgin Islands between 1930 and 2004.

Survey year	# and percent of commercial of fishers who are full time (FT) or part time (PT)				Total # of Commercial Fishers	USVI Population	% of population commercially fishing
	FT	%	PT	%			
1930[1]	n/a		n/a		405	22,012	1.8%
1968[2]	120	30%	280	70%	400	55,000	0.73%
2003-4[3]	215	67%	108	33%	383	108,612[4]	0.3%

[1]Fiedler and Jarvis, 1932
[2]Swingle et al., 1970
[3]This survey
[4]2000 US Census – www.census.gov/prod/cen2000/island/viprofile.pdf - July 17, 2004.

Description of Commercial Fishers in the USVI

Ethnicity

In 1930, Fielder and Jarvis (1932) reported that 88% of fishers were "colored" and 22% were white. In this study, while black and West Indian fishers made up the largest percentage of the fisher population, 38.5% of fishers were Hispanic and 17% were French (Table 2). No Hispanic fishers were reported in 1930 (Fielder and Jarvis 1932).

In STT/STJ District the commercial fishing industry was dominated by people of French descent (55% of fishers both black and white) (Table 2). The French ethnic community has a long fishing tradition on the island of STT that goes back to at least 1867 when descendants of French colonists came to STT and established a French community in Honduras (now known as Frenchtown) (Fielder and Jarvis 1932). A second primarily French fishing and farming community was established on the northside of St. Thomas with fishing activities concentrated around Hull Bay (Downs and Petterson, 1997). People identifying themselves as black were the second largest group (39% including Black French fishers) in STT/STJ District (Table 2).

In STX District there were no fishers that identified themselves as French. The two most common ethnic identities were Hispanic (48%) and black (42%).

Age

In 1968, the average US Virgin Islands' fisher was almost 45 years old and had been fishing for 19 years (Swingle et al. 1970). There was concern that commercial fishing was attracting fewer of the younger generation because of the increase in better paying jobs in tourism and government (Swingle et al. 1970). In 2003, the average age of commercial fishers was 50.5 years (Table 3), 5.5 years older than in 1968 (Swingle et al. 1970). The increasing age of commercial fishers and their declining numbers as a percentage of the population (Table 58), indicated that commercial fishing continued to attract fewer of the younger generation. The low number of recent entrants into the USVI commercial fishery (<5 years) was, in part, a function of the moratorium on the issuance of new commercial fishing licenses that had been in effect since August 24, 2001. However, relatively few fishers stated that they started fishing even within the last 10 years (Table 10).

Education

Over half of STX District fishers had completed only elementary school or junior high school compared to 20% of STT/STJ District fishers (Table 4). The higher level of education reported by STT/STJ fishers may be a function, at least in part, of the somewhat younger age of the fishers in this district. There is no comparable information on the education level of fishers from the two previous censuses (Fielder and Jarvis 1932 and Swingle et al. 1970).

Full-time/Part-time fishers

A commercial fishing permit is required in order for a fisher to sell fish and/or use such gear as traps and nets (Title 12 of the VI Code). Also, licensed commercial fishers are exempt from a number of fees such as mooring fees.

Since at least 1987, USVI fishers have disagreed among themselves regarding whether part-time fishers should be allowed to be licensed as commercial fisher (USVI Government 1987). Part-time fishers usually have other employment and only fish on weekends or when they have free time. Part-time fishers also include those who obtain a commercial fishing license primarily to avoid paying fees (Downs and Petterson, 1987) and/or to use gears that require a commercial fishing permit such as traps and nets.

Over 66% of commercial fishers in the USVI consider themselves full time fishers (Table 5). In STT/STJ District, 77.3% of fishers considered themselves full time compared with only 61% of STX District fishers (Table 5).

Fishers can also be divided into full time and part time based on income. If full time fishers were those that made more than 50% of their income fishing, then 54% of fishers in STX District (Fig. 15) and 75% of fishers in STT/STJ District (Fig. 14) were full time fishers.

Another way of dividing fishers into full time and part time is the amount of time spent in all fishing related activities (Table 59) (Questions: 25, 26, 28). In the questionnaire, fishers were asked if they were part-time fishers, working $\leq$ 36 hrs per week on fishing related activities, or

full time fishers, working >36 hrs per week. Based on these criteria, 41.5% of USVI fishers were full time fishers. If one considers part time as working ≤20 hrs per week and full time as working >20 hrs per week on fishing related activities, then 68% of USVI commercial fishers were full time fishers (Table 59).

Table 59: The number of hours fishers spent each week conducting all fishing related activities.

Hrs spent on fishing related activities each week[1]	St. Thomas/St. John District		St. Croix District		USVI	
	N[2]	%	N	%	N	%
≤ 20 hrs	41	35.0%	68	30.5%	109	32.1%
≤ 36 hrs	38	32.5%	52	23.3%	90	26.5%
> 36 hrs	38	32.5%	103	46.2%	141	41.5%
Total	117	100.0%	223	100.0%	340	100.0%

[1]Calculated by multiplying the mean number of trips by the mean number of hours per fishing trip and adding the amount of time fishers stated that they spent selling fish, constructing and repairing gear, and repairing the boat(s) they used fishing.
[2]N = Number of fishers responding.

In a 1959 survey of St. John fishers (Idyll and Randall 1959), only 13% of the 83 fishers identified as engaging in fishing were full-time fishers. In 1968, Swingle et al. (1970) estimated that 30% of USVI fishers engaged in commercial fishing activities were full time fishers and 70% were part time. The criterion used to distinguish part-time and full-time fishers was not included in either report. Using the three criteria described above, the number of full time fishers in the USVI in 2003 ranged from 41.5% to 66%. Therefore, the percentage of full time commercial fishers had increased since 1968. Although the number of commercial fishers declined as a percentage of the population in 2003 compared to 1968, the number of full time fishers (the amount of fishing effort) increased.

Number of years commercial fishers have fished and expect to fish

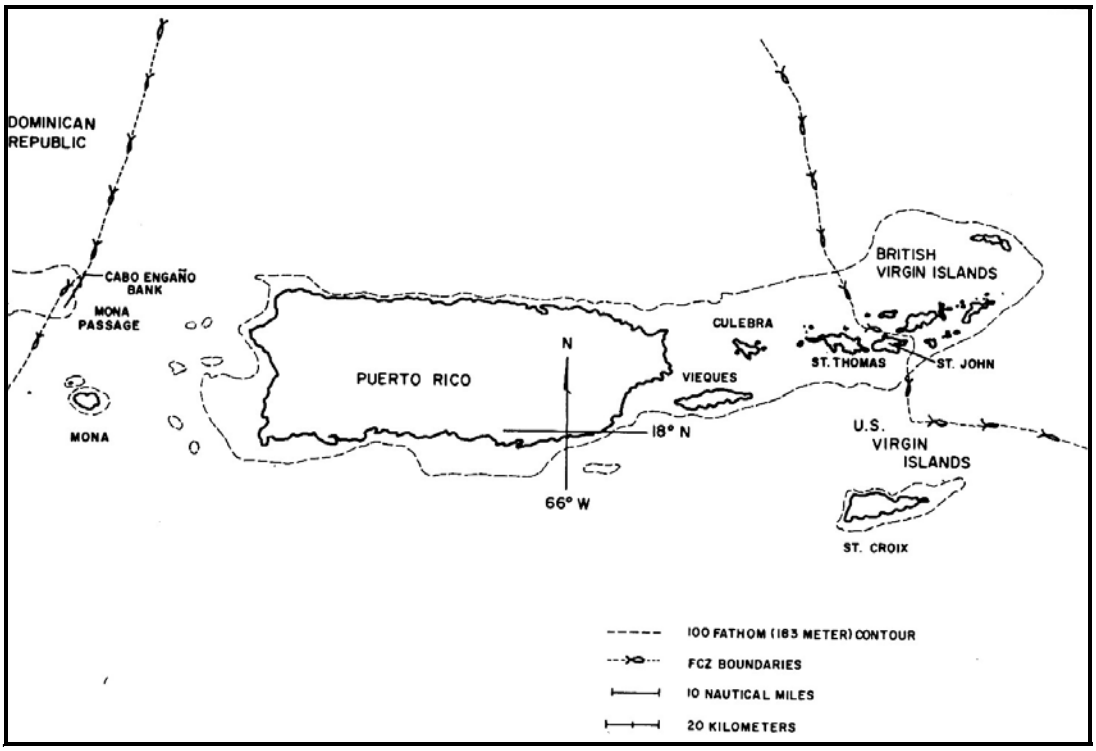
Licensed commercial fishers in the USVI fished an average of about 23 years, ranging from 0 to 67 years (Table 10). There was a distinct difference in the length of time fishers expected to fish in STT/STJ District compared with STX District. Nearly three quarters (74%) of STT/STJ District fishers expected to continue to fish for the rest of their lives while only 41% of STX District fishers expected to do so (Table 11).

Description of the Fish Targeted and Fishing Gear by USVI Commercial Fishers

The commercial fisheries of STT/STJ District and STX District differed in the proportion of fishers targeting the various categories of fish and in the number of fishers using various types of gear. One of the reasons for this was the size and depth of the insular shelf surrounding each district (Fig. 13). The area of the insular shelf is limited in both districts, but this is especially true in STX District.

Commercial fishing in the USVI was largely confined to the insular shelf (total area: 630 nm^2) and shelf edge with some fishers, especially in STX District, fishing pelagic stocks in deep water. The shelf around the northern USVI (STT/STJ District) is approximately 8 miles wide to the south of the islands and 20 miles wide to the north (Fig. 13). The depth of water over most of the shelf is >60 feet with much of the shelf in water >100 feet deep. STX District lies approximately 40 miles south of STT/STJ District and is separated from the northern Virgin Islands by a deep trench. The shelf around STX is shallower (<60 feet deep) and considerably smaller (120 nm^2) than the shelf around the northern USVI (510nm^2) (CFMC 2004). In fact, 81% of the shelf area in the USVI extends from the islands of St. Thomas and St. John. Most of the STX shelf, except for Lang Bank to the east of STX, lies within the 3 nm territorial jurisdiction. On the northwest side of STX, the shelf edge may be only 100 yards from shore.

Figure 13: Map of Puerto Rico and the US Virgin Islands (Source: Jacobsen and Browder, 1987) showing the extent of the insular shelves (≤200m depth) of the Puerto Rico Bank (Puerto Rico and the northern Virgin Islands, including St. Thomas and St. John District) and St. Croix District.



Categories of Fish Targeted

In 2003, most commercial fishers targeted reef fish in the USVI (82%). However, in STX District, fishing had diversified. STX District fishers targeted deepwater pelagic fish (33% of fishers) and deepwater snapper (42%) (Table 7). The popularity of these two fish categories in STX District may be in part a function of the smaller size of the STX shelf compared to STT/STJ and the proximity of deepwater to the island.

Fishers in both districts generally targeted more than one category of fish with some fishers targeting up to 8 categories (Table 8). Given the proximity of deepwater to STX, individual fishers targeted more categories of fish in STX District than in STT/STJ District.

Boats and Engines

Table 60 summarizes boat ownership trends between 1930 and 2003. In 1930, less than half the fishers in the USVI owned a boat (Fielder and Jarvis 1932). Most boats were made of wood and were sailed (38) or were rowed (147). Only one boat was powered by a motor. In 1967 the percentage of fishers owning vessels declined (Swingle et al. 1970). However, almost all boats had engines: 72.9% of boats in STX District and 97.1% on STT/STJ District were powered by gasoline engines and 21% and 7% respectively were powered by inboard engines (Swingle et al. 1970).

In 2003, wooden boats were uncommon. Most boats were constructed of fiberglass or fiberglass and wood (93.4% of boats in the USVI) (Table 23). Also, most fishers owned or co-owned a boat (Table 12). The number of boats (including dinghies) in the fishery was greater than the number of fishers (Table 60), though 6.2% of fishers surveyed did not own a boat (Table 22). Nearly every boat was powered by an engine (Table 61).

Table 60: Number of boats and percentage of boat ownership in the fishery based on the number of boats divided by the number of fishers.

Survey year	# of fishers interviewed				# of boats and percentage of boat ownership							
	STT	STJ	STX	USVI	STT	%	STJ	%	STX	%	USVI	%
1930[1]	127	78	200	405	58	17%	41	52%	87	44%	186	50%
1967[2]	60	72	153	285	36	60%	16	22%	37	24%	89	31%
2003-4[3]	103	13	217	333	138			119%[4]	235	108%	373	112%

[1]Fiedler and Jarvis 1932.
[2]Swingle et al. 1970. Only 69% of full time fishers and 25% of part time fishers were interviewed.
[3]This study.
[4]Percent is for STT/STJ District and is >100 because the some fishers interviewed had more than one boat.

Table 61: Percentage of boats with engines in the US Virgin Islands in 1930, 1968, and 2003.

Survey year	# of fishers interviewed			% of boats with engines		
	STT	STJ	STX	STT	STJ	STX
1930[1]	127	78	200	0%	0%	1.1%
1968[2]	60	72	153[3]	100%	100%	100%
2003[3]	103	13	217	100%		99%

[1]Fiedler and Jarvis, 1932
[2]Swingle et al. 1970. Only 69% of full time fishers and 25% of part time fishers were interviewed.
[3]This study.

Boat length for the majority of fishers changed little between 1930 and 2003. In 1930 boat length ranged from 15 to 20 feet (Fiedler and Jarvis 1932). In 1968, the average boat length ranged from 14 to 20 feet (Swingle et al. 1970). However, in 1967 there was a fleet of large vessels with inboard engines in STX District that ventured up to 100 miles to catch and sell seafood (Swingle et al. 1970). As countries claimed jurisdiction of their Exclusive Economic Zone (EEZ) (all waters 200 nm from their shoreline) in the 1970's and prohibited fishing in their EEZ, this fleet of large vessels declined. In 2003 (this study), only 11 boats (4.4% of fleet) were >30 feet in length (Table 16). Most commercial fishers in the USVI fished from boats 16 – 25 feet in length (72%) (Table 16). However, in contrast to 1968, boat size in both districts was not significantly different, although a higher percentage of fishers in STT/STJ District (24.4%) had larger boats (>26 feet) compared with STX District (8.6%).

Electronic Gear used on Boats

The most common electronic communication and safety device carried on board fishing vessels in 2003 was the cell phone (60% of USVI fishers) (Table 24). Cell phones were more commonly carried by fishers in STX District where fishing grounds were in closer proximity to land and, therefore, cell phone antennae than in STT/STJ District (Table 24). In STT/STJ District, fishers used marine radios on their boats (46%) almost as frequently as cell phones (53.2%). Fishers that fished the shelf edge in STT/STJ District, especially to the north of the islands, were frequently unable to get a cell phone signal or would pick up the British Virgin Islands cell phone provider (L. Aubain and R. Gomez, pers. com.). Very few fishers in either district carried an EPIRB (Table 24).

GPS was much more commonly used on boats in STT/STJ District in 2003 than in STX District (Table 24). In STT/STJ District, it was used to locate traps set "blind" (without a surface buoy attached) in deep water (60 to 170 feet) on the shelf (pers. com.). In STX District, most traps were set in relatively shallow water on the shelf and were buoyed (W. Tobias and W. Toller, pers. com.). This minimized the need for purchasing a GPS for locating traps. Echo sounders were commonly used in both districts (Table 24), but again more frequently in STT/STJ District where the shelf is deeper and the bottom habitat type often impossible to distinguish from the surface.

Equipment used on boats

Winches and reels were the most common equipment installed on fishing boats in the USVI (Table 25) in 2003. Winches were commonly used to pull traps and were thus more common in STT/STJ District where over 85% of the trap fishing in the USVI was conducted. Reels in general, specifically electric and hand reels, were more commonly used by STX District fishers where they were used to haul vertical set lines used to fish for deepwater snapper and grouper. Vertical setlines were more commonly used by STX District fishers.

Fishing Gear

Multi-species and multi-gear fisheries are common throughout the Caribbean (Munro and Smith 1983, Sary 2001). This was true in the USVI in 1987 (Tobias, 1987) and continued to be true in

2003. Not only did fishers target a variety of fish species, they also targeted a wide range of species and habitats requiring different types of gear. Following is a brief discussion of the changes that have occurred in the USVI with respect to the importance of various gears and the methods of construction.

Gear – Fish Traps

Fish traps (pots) have been the most widely used gear in the USVI since the 1930's (Fielder and Jarvis 1932, Idyll and Randall, 1959, Swingle et al. 1970). Trap design has changed little but the materials used to construct traps have changed. In the 1930's, arrowhead traps were common (the following description is from Fiedler and Jarvis 1932). The traps were made from mats of split withes (a vine) woven into a hexagonal mesh and braced with a framework of wood. Tyre palm leaf was used to fasten together both the withes and frame. Some traps were made of ordinary chicken wire with a wood frame. Mesh size ranged from 1 to 2 inches. Traps varied in size, but the average trap measured 5 ft in length, 3 ft in width, and about 1.3 feet in height. Because the frame was of wood they had to be weighted with rocks. The funnel entrance was at the center of the base of the arrowhead. A single door was cut in the side to remove the catch. Each trap was marked with a float or marker of light wood which was attached to the trap with a line made of plaited vines.

Crucian fishers favored making their traps from 1/8 inch diameter marine cable, which fishers obtained from discarded marine cable. These traps lasted about 18 months while the wooden traps lasted only about 6 months (Fiedler and Jarvis 1932).

Table 62: Number of gears used by fishers in the US Virgin Islands in 1930, 1968, and 2003.

Survey year	Number of Fishers			# of Gears						
	Total # Fishers	Fishers Sampled		Fish pots	Lobster Pots	Beach seines	Cast nets	Vertical Set lines[1]	Hand lines[2]	Troll lines[3]
		#	%							
1930[4]	405		85%	1,600	0	40	113	25	204	68
1968[5]	400	153	38.3%	838	425	n/a	n/a	n/a	n/a	n/a
2003[6]	383[7]	339	88.5%	3,886	4,756	18	147	68	192[2]	118

[1] Fiedler and Jarvis called these trawl lines but the description was the same as for vertical set lines in this study.
[2] Number of hand lines used by anchor fishers.
[3] Troll lines refer to a type of fishing. Troll fishers may use rods and reels or hand lines.
[4]Fiedler and Jarvis, 1932
[5]Swingle et al., 1970, Table 1, p. 115.
[6]This study.
[7]Total number of licensed fishers during this study.

In 1968, traps were still the most widely used gear. Swingle et al. (1970) stated that "fishing with pots in shallow water is still the principal method of harvesting food in the Virgin Islands." Traps were still primarily constructed in the shape of an arrowhead (chevron) but new materials were being used, especially the plastic coated or galvanized welded-mesh chicken wire. Occasionally, the frame was made of reinforced steel instead of wood and a zinc anode added to prevent electrolysis. Mesh size ranged from ¾" to 2". A single door was constructed to remove the catch. Traps were still individually buoyed. The hardwire traps previously made were very

rare (Swingle et al. 1970). The importance of traps to the commercial fishers of the USVI persisted until at least 1981, when Olsen and LaPlace (1981) stated that "over 80% of Virgin Islands fishermen use only traps."

In 2003 (this study), while traps were still an important fishing gear (Table 62), they were less important in STX District than in STT/STJ District (Tables 33, 34 & 35). Trap design was much more diverse than in 1967. The traditional arrowhead traps were still popular but many fishers now commonly built square or rectangular traps and sometimes Z or S shaped traps. Most traps were built of reinforced steel and covered with plastic or galvanized mesh, though some fishers, especially on STX still used wood to construct the trap frame. According to Title 12, VIRR, the minimum mesh size was 1.5" hexagonal on STX and 2" square on STT/STJ District. Traps were required to have two escape panels in federal waters, but only one escape panel in territorial waters. Many traps were built to meet federal requirements, especially in STT/STJ District where trap fishing on the shelf outside the 3 nm territorial limit was common. While individual traps were buoyed in STX District, STT/STJ fishers usually set their traps in a "string" with only one or no buoy (Downes and Petterson 1997; D. Greaux pers. com.). The traps were connected by floating line and triangulation or, more commonly in 2003, GPS was used to relocate the traps (Table 24). By setting the traps blind, the fishers minimized trap loss due to entanglement with vessel propellers, especially the propellers of large freighters and cruise ships that plied the waters around the USVI in large numbers (D. Berry, pers com.). It also made trap theft more difficult (D. Greaux and C. Berry, pers. com.).

In 1930, 85% of fishers were interviewed (Fiedler and Jarvis, 1932) compared to only 38.3 % of fishers in 1968 (Swingle et a., 1970). In 2003, 83% of fish and lobster trap fishers in STT/STJ District and 82.6% of fishers in STX District were interviewed. Assuming that fishers were randomly interviewed in the 1930, 1968, and 2003 surveys, an expanded estimate of the total numbers of traps in the fishery can be calculated based on the percentage of fishers interviewed (Table 63).

Table 63: Number of fish and lobster pots used in the US Virgin Islands fishery

Year of survey	Location	% of fishers interviewed	# of traps reported in USVI districts	# of traps reported in USVI	Expanded data[1]
1930[2]	USVI	85%		1600	1,882
1968[3]	USVI	38.3%		838	3,296
2002/03[4]	USVI	n/a		8,815	n/a
2003[5]	STT/STJ	83.0% [6]	7,407		8,924
	STX	82.6% [7]	1,235		1,495
	USVI		8,642		10,409

[1]Expanded data were calculated by dividing the number of traps reported by the percentage of fishers interviewed.
[2]Fiedler and Jarvis 1932. [3]Swingle et al. 1970.
[4]USVI catch report data from the FY2002-03 fishing year.
[5]This study
[6]Percentage based on 54 fishers reporting that they fished traps in the 2002-03 catch reports and only 44 respondents reporting owning traps in this study.
[7]Percentage based on 69 fishers stating that they owned traps but only 57 fishers reporting on the number they owned.

The numbers of pots or traps in use increased from approximately 1,882 in 1930 to over 3,000 traps in 1968 and between 8,642 and 10,409 (Table 63) in 2003. While the number of commercial fishers remained stable over this period, the number of traps doubled between 1930 and 1968 and nearly tripled between 1968 and 2003. This increase in number of traps has caused concern among fishers for many years. A number of fishers have suggested that the number of traps allowed per vessel be limited (Downes and Petterson 1997).

Gear – Nets

In the 1930's tangle nets were used to catch turtles and woven from cotton seine twine (Fiedler and Jarvis 1932). While fishers were familiar with gill nets, Fiedler and Jarvis (1932) only observed turtle nets being used. Swingle et al. (1970) stated that the primary nets in use in 1967 were beach seines used to harvest bait, little tuna (*Ethynnus alletteratus*), or jacks. No purse seines or gill nets were in use in 1967 (Swingle et al., 1970). However, small modified tangle nets were still used to catch sea turtles. After 1987, nets had become a common component of the USVI fishery (USVI Government 1987). In 2003, nets in STT/STJ District were not commonly owned by fishers (Tables 26 – 30 & 32), except for cast nets (Table 31). Trammel net and gill net ownership in STX District (Tables 29 & 30) was higher than STT/STJ District. The number of gill and trammel nets in use in STX District, combined with their effectiveness in catching fish, especially when used in conjunction with snorkelers or scuba divers, was causing concern among STX fishers (Table 56).

Gear – Vertical Set lines.

In 1930, Fiedler and Jarvis (1932) recorded 25 "trawl" lines with a total of 735 hooks. Hooks were tied about 2 feet apart. From Fielder and Jarvis (1932) description, "trawl" lines appear to have been constructed and used as vertical setlines are today (see Appendix II), though some "trawl" lines were deployed with floats on either end and were used in a similar fashion to surface long lines. This gear was fished in water 60 to 360 feet deep (Fiedler and Jarvis, 1932). In 1967, Swingle et al. (1970) did not mention this type of gear though they did state that fishermen fish in deep water (600-1200 feet) while anchored. Fishers called this "banking" and fished anchored at the edge of the shelf (Swingle et al. 1970).

Much of the shelf edge around the USVI is steep with the depth increasing very rapidly - in as little as a boat length (R. Gomez, pers. com.). In this study, vertical set lines were reported to be commonly used in the USVI, especially by STX fishers (Table 38), to catch deepwater snapper and grouper along the insular shelf edge.

Gear – Scuba

Scuba gear was not invented in 1930 and was not reported to be in use in 1967 by Swingle et al. (1970), although they mentioned that skin divers harvested conch and lobsters. In 2003 scuba was an important component of the USVI commercial fishery, especially in STX District (Table 44). Fishers used scuba gear to harvest conch by hand, lobster with a snare or by hand, to spear fish and to drive fish into trammel and gill nets (Table 44 and W. Tobias, pers. com.). Scuba

gear was also used by fishers to enable them to adjust bottom gill and trammel nets after deployment and to free them from coral, rocks and gorgonians when being retrieved (W. Tobias, pers. com.). A new technique used in STT/STJ district using a PVC pipe and salted cowhide to attract lobsters (see Appendix II) generally required that divers use scuba gear to retrieve the PVC pipe and harvest the lobsters (R. Gomez, pers.com.).

Gear – Other Gears

Hand lines and cast nets have remained a staple gear throughout the years (Fiedler and Jarvis 1932 and Swingle et al. 1970). In 2003 most fishers used these gears at least occasionally (Table 62). The majority of fishers line fished with hand lines using inexpensive plastic reels, but a few, especially those targeting pelagic fish used rods and reels (Tables 40-42). Cast nets were commonly used to catch bait to use for other fishing methods or for sale (pers.com.).

Description of Fishing Activities in the USVI

Most commercial fishers not only caught fish but they constructed and repaired their gear, repaired their boats, and marketed their fish (Table 59). A typical commercial fisher in the USVI fished three times a week with one to two helpers (Tables 45 & 46) for about 7 hours each time (Table 45). They spent an average of 8 hrs per week selling fish, 3.2 hrs per week fixing his boat, and 4.1 hrs per week fixing his gear (Table 48).

If they lived on STJ, they were most likely to land his catch at either Cruz Bay or Coral Bay (Table 49). If they lived on STT, they landed their fish at one of 19 different sites (Table 50). However, whichever site they chose was likely be the site they used every time. The three most commonly used landing sites were Frenchtown, Hull Bay or Benner Bay. If they lived on STX, they might land their fish at one of the 18 sites (Table 51). However, they were most likely to land their fish in Altona Lagoon, Christiansted; Molasses Pier; or Frederiksted Fisherman's Pier (Table 51). Many STX fishers trailered their boats (pers. obs. and W. Tobias, pers. com.). As a result, a substantial portion (35%) of fishers on STX landed their fish at more than one site (Table 52).

It has been a tradition in the USVI to sell fish whole without icing it since 1930 (Fiedler and Jarvis, 1932). In the 1930's ice was expensive and availability was limited (Fiedler and Jarvis, 1932). In 1967-68, customers were "prejudiced against iced fish" (Swingle et al, 1970, p. 119). As a result, fish were seldom gutted or scaled; it was sold whole, either live or dead. In 2003, USVI fishers still commonly marketed their fish whole (Figs. 8 and 9) without icing it. However, nearly half of fishers in STT/STJ District and a third in STX District sold their fish gutted, scaled or filleted and about a quarter of fishers used ice (Figs, 8 and 9).

In 1968, fishers in the USVI sold their catch directly to the consumer with a few selling directly to commercial outlets (Swingle et al., 1970). In 2003, fishers in the USVI sold their catch to a wide variety of customers (Fig. 11 and 12). In both Districts fishers commonly sold fish to restaurants and to customers at their landing site. In STT/STJ District, fishers also commonly sold fish along the road and at formal and informal fish markets established throughout the

district. In STX District fishers commonly brought their fish home for personal use or sale. They also sold to retail outlets, to special customers, to a buyer or brought their fish to the government fish market to sell.

In 1930, Fiedler and Jarvis (1932) estimated that the catch in the USVI could be increased by as much as 50%. On STJ, fishing was primarily for personal use as there was little opportunity to sell the catch. Fishers caught fish in abundance and had to take their fish to STT in order to find a market. However, the markets in the USVI were often glutted and fishers sometimes had to throw away their catch. In 1967-68, Swingle et al. (1970) stated that while the number of fishers remained essentially the same as in 1930, the catch had increased. They interpreted this to mean stocks were not in danger of being over fished and bottom fishing could be increased. However, the effects of pollution on fisheries nursery habitats were evident.

In 1987, the Virgin Islands Department of Planning and Natural Resources, Division of Fish and Wildlife held a conference entitled "Fisheries in Crisis" (USVI Government, 1987). The conference was held to address the decline in the USVI fisheries. The result of the conference was the implementation of a number of management measures.

In this census (2003), fishers were asked if fishing was "better", the "same" or "worse" than 10 years ago. Most fishers in STT/STJ District responded that fishing was the same with only 36% responding that fishing was worse (Table 54). In STX District, 68% of fishers responded that fishing was worse (Table 54). The decline in fishing in STX District had been noted since 1967 when Swingle et al. (1970) reported that STX fisheries had suffered from the dredging operations on the south shore. In 1967, fishers on STT caught more fish than on either STX or in the BVI and catch per unit effort and annual catch per man was lower on STX than on STT (Swingle et al. 1970).

Fishers who answered "worse" to Question 32 in 2003 were asked the reason why (Question 33). In STX, the main reasons given for fishing being worse were that net fishers were taking too many fish, there were too many fishers, there was less fish, and there was over fishing (Table 56). These reasons supported the request in 2001 by STX fishers to the Commissioner of DPNR to limit the number of commercial fishers on STX because of the limited fishing grounds in that district. The main reasons given by fishers who responded that fishing being worse in STT/STJ District were that they caught less fish, area closures had been implemented, there were too many traps and over fishing was occurring (Table 55). Almost 20% of STT/STJ District fishers felt that area closures were making fishing worse. The recently declared Coral Reef National Monument closed a substantial area of the shelf south of STJ to anchoring and almost all fishing (Executive Proclamation, 2001) which combined with other closures such as the Red Hind Marine Conservation District Closure and the St. James and Cas Cay/Mangrove Lagoon Marine Reserves and Wildlife Sanctuaries (USVI Code, Title 12, VIRR) (described in DPNR, 2004) and the fishing restrictions in the St. John National Park.

CONCLUSION

The USVI commercial fishery was a small scale fishery that in some ways had remained unchanged since the 1930's but in other ways was changing to take advantage of technological advances, new techniques, and new markets. The fishery continued to be a locally owned, family based industry (pers. obs.). Licensed commercial fishers in the USVI were small business owners. They still predominately fished for reef fish (Table 7), they still harvested fish in small boats (Tables 15 and 16), and they still used traps (Tables 33 – 35). However, while traps were in common use for both fish and lobster, fishers also use a wide range of other gears to catch reef fish (Tables 29, 30 and 40-42), deepwater snapper and grouper (Table 38), coastal and oceanic pelagic species (Tables 40-42), and conch and lobster (Tables 43 and 44). This diversification was a necessity in some cases, such as on St. Croix where reef fish stocks have declined and traps did not catch the numbers of fish that they once did (W. Tobias, pers. com.). Fishers also added winches to their boats as they increased the number of traps deployed and installed electric, gas, hydraulic or hand reels to quickly haul deepwater vertical set lines (Table 25). They carried GPS with them to find their traps (Table 24). They also used GPS in conjunction with an echo sounder to find their favorite fishing grounds. For safety they carried cell phones, marine radios, and, in a few cases, an EPIRB.

New markets opened for their products. In 1930, there was little or no tourism in the USVI. In 1967, tourism was a recognized component of the USVI economy (Swingle et al., 1970). By 2003, restaurants, hotels, and retail markets bought as much lobster as fishers could catch during the tourist season and bought extensive amounts of top quality fresh fish, especially in STT/STJ District (M. Lester, pers. com.).

Many of the concerns expressed in 2003 by fishers who stated that fishing was worse were the same ones that had been expressed for over 15 years (USVI Government 1987). They included declining fish stocks, too many traps, and the loss of fish and shellfish nursery habitat to development and pollution. However, in 2003 new concerns arose, including the concern that there were too many fishers for the size of the fishing grounds. This concern was compounded by the loss of fishing grounds that came with the closure to fishing of large areas of the shelf with the Presidential Proclamations of January 17, 2001 establishing the Virgin Islands Coral Reef National Monument and enlarging the boundary of Buck Island National Monument (US Government, Federal Register, Vol. 66, No. 14, Proclamations 7399 and 7392, respectively). Resolution of these concerns will not be easy.

This fisher census contributes to the suite of information about the USVI commercial fishery that is essential for assessing and managing this fishery. The information contained in this census will be useful for fishery managers, fishers, fisheries advisory committee members, and marine park managers who are responsible for developing management plans and regulations that will ensure sustainable fisheries, reduce conflicts among all users of marine resources, and conserve marine resources.

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Appendix I

U.S. VIRGIN ISLANDS COMMERCIAL FISHER CENSUS 2003

1. Name of Commercial Fisher: _____ 2. Ethnicity: _____
3. Nickname: _____ 4. Age: _____ 5. Phone: _____
6. Address: _____
7. Level of education completed: [ ]elementary school [ ]junior high [ ]some high school [ ]high school [ ]some college [ ] college
8. Type of Fisher: [ ]full-time(>36hrs/wk) [ ]part-time(≤36hrs/wk) [ ]opportunistic [ ]charter
9. Are you a licensed ***commercial*** fisher? [ ]no [ ]yes, License No.: _____
10. Do you belong to a fishing organization? [ ]no [ ]yes, organization name: _____
11. What do you commercially fish for? [ ]reef fish [ ]coastal pelagic [ ]bait [ ]conch [ ]whelk [ ]deepwater pelagic [ ]deepwater snapper [ ]lobsters
12. How years have you fished? _____ years
    How many more years do you expect to keep fishing? _____ years

BOAT(S) AND EQUIPMENT THAT YOU USE IN COMMERCIAL FISHING

13. How many fishing boats do you own for commercial fishing? _____

			boat 1	boat 2	boat 3	boat 4	boat 5	***spares***
14.	Boat Registration No.							
15.	Year Boat Built							
16.	Boat length (ft)							
17.	Number/type of engines:	Outboard						
		Inboard						
		Inboard/Outboard						
18.	Engine Power:	Engine 1 HP						
		Engine 2 HP						
		Engine 3 HP						
19.	Fuel:	Gas						
		Gas and oil						
		Diesel						
20.	Do you own the boat?							
21.	Boat Construction:	Wood						
		Fiberglass						
		Fiberglass & wood						
		Aluminum						
		Steel						
22.	Boat Equipment/Electronics	GPS?						
		Echo sounder						
		Marine radio?						
		EPIRB						
		Cell phone						
		Radar						
		Other (specify):						
23.	Fishing Equipment:	Winch?						
		Hydraulic Reel?						
		Electric Reel?						
		Other (specify)						

24. FISHING GEAR THAT YOU USE IN COMMERCIAL FISHING

Seine/Nets/Pots	bar mesh (inch)	composition (material)	length (ft)	height (ft)	width (ft)	shape	qty owned	use<3 miles	use>3 miles	season used	hours soaked	hours fished
Beach seine											X	
Haul Seine											X	
Gillnet												X
Trammel net												X
Cast net											X	
Umbrella (lift) net											X	
Plastic lobster pots												X
Modified pot for Lobster												X
Fish pots												X

Hook & Line	length (ft)	hooks /line	qty own	use<3 miles	use>3 miles	season used	hours fished
Surface longline							
Bottom longline							
Vertical setline (multi-hook deepwater snapper/grouper)							
Vertical setline (single hook for pelagics)							
Trolling – Handline? Rod & reel?							
Drift fishing - Handline? Rod & Reel?							
Anchor fishing – Handline? Rod & Reel?							

Submarine Fishery	with net?	Snare # owned	gaff # owned	speargun # owned	# tanks owned	use<3 miles	use>3 miles	season
Skin (free) diving					X			
Hookah diving					X			
SCUBA diving								
Other (please specify):								

25. How often do you fish? _____ trips per week
26. How long are your commercial fishing trips? _____hours/trip

27. How many people commercially fish with you? [ ]fish alone [ ]With _____ helpers [ ]With _____ other commercial fishers
28. How many hours per week do you spend on: (a) fixing your boat _____hrs/week
    (b) repairing fishing gear/preparations _____ hrs/week (c) fish sales _____ hrs/week

29. Where do you land your fish? _____
30. How do you market your fish? [ ]whole [ ]gutted [ ]iced [ ]filleted [ ] scaled
    [ ]cleaned (gutted & scaled) [ ]other (specify):_____
31. Where do you sell your fish? [ ]fishing association [ ]private fish company [ ]buyer [ ]at home [ ]restaurant
    [ ]at landing site [ ]along the road [ ]retail market [ ]other (specify): _____

32. Compared with 10 years ago, is fishing … [ ]better [ ]same [ ]worse
33. If you answered "worse" to the above question, why is fishing worse?

34. What percentage of your income comes from commercial fishing? _____ percent

For Office Use Only
Interview (circle one): no contact refusal partial complete
For no contact, specify date, time, and method of 3 attempts: _____
For refusal or partial interviews, why? _____
Interviewer Name and Initial: _____ Date: _____ Time: _____

Appendix II

Fishing gears of the US Virgin Islands

The following descriptions of fishing gears (e.g., nets, lines, pots, and fishing gear used while skin or SCUBA diving) are available for the Virgin Islands. Information provided here is based on Matos Caraballo and Torres Rosado (1989) as well as informal information collected in this survey by Division of Fish and Wildlife staff from local commercial fishers. Many fishers in the USVI, particularly on St. Croix, originated from Puerto Rico. Therefore some of the Spanish names provided by Matos Caraballo and Torres Rosado (1989) are included here.

1.Nets

a. Beach seine (in Spanish, chinchorro, chinchorro de arrastre or chinchorro de buche): net made of mesh webbing and consisting of two wings and a bunt, or bag. The net is suspended from floats and has weights on the bottom. The mesh is usually all the same size. The actual size of the mesh depends on the species of fish targeted. Note both this net (beach seine) and the long haul seine (below) are typically made by sewing two or more pieces of net of various depths together. The net is set in water no deeper than the height of the net. Generally, a powered motor boat or rowboat is used to set the net and it is hauled to shore by a group of 2 – 4 people, though many more may be needed and may be recruited from the beach. Depending on the length of the net and the bottom topography, several individuals with snorkeling gear may be used to free the net from bottom obstructions. To reduce bycatch mortality, Title 12 of the VIRR prohibits beach seines from being removed from the water while they still contain fish. The fish must be harvested or released while the net is still in the water. If there are many fish in the net and the fishers do not want to go with all the fish at one time, the fishers may "tuck the net" after hauling it to shore. This entails drawing the net to shore in the middle and gathering the fish from only one half of the net, leaving the other half of the catch in the water to be brought ashore later in the day. This is a means of preserving a large catch until the fisher can transport the fish to market. Each person handling the net receives a portion of the net.

b. Haul seine (chinchorro balajucero): is a modification of a beach seine in which long (rather than short as in the beach seine) haul warps are used. This has the advantage of allowing the net to be set further from shore and is usually used in shallow areas offshore where the bottom of the net maintains contact with the substrate. The depth of this net is shallower on one or both ends. When deployed offshore, fishers "round the net" (close up the net) to catch schools of fish. These nets are up to 1000 feet in length and 38 feet in height. They are usually longer and higher than the ballyhoo haul seines used by St. Thomas/St. John District fishers (Table 26). Also many more people are used to haul this type of net and usually one or more individuals with snorkeling gear are used to free the net around bottom obstructions.

In the St. Croix District, haul seines (referred to as jack nets) are used to harvest schools of bigeye scad (*Selar crumenophthalmus*) in water from 35 to 100 feet deep and up to 1000 feet long. The nets extend from the surface to the bottom and are used to surround an entire school of jacks which typically hover near the bottom. The nets are set and pursed offshore with scuba

divers using scuba gear. Several thousand pounds of jacks may be caught at one time on St. Croix requiring several boats to unload the catch and more than one day to unload the boat. Significant spoilage of the catch may occur. In St. Thomas/St. John District haul seines are primarily used to catch yellowtail snapper, bar jack, and blue runner.

c. Gill net (trasmallo filete, chinchorro de ahorque or chinchorro de vela) (Appendix III, photos 6 & 7): a net in which fish become entangled by their gill covers. Gill nets may be suspended from buoys or left to drift at the surface, in midwater, or anchored to the bottom. The range of the mesh size is 0.5-6.0 inches in Puerto Rico. In the USVI the mesh size range is smaller, 1.25 to 3 inches. Gill nets can be used to harvest baitfish at the surface, mid-water inshore pelagic fishes and bottom fishes.

Depending on water depth, gill nets in St. Croix may be set with aid of divers with scuba gear. In St. Croix District, bottom gill nets may be used in combination with trammel nets to catch schools of herbivorous parrotfish and acanthurids. Bottom gill nets are typically set in the late afternoon to block the daily migration routes of fishes as they travel from inshore feeding sites to offshore resting areas. Divers piece sections of net together underwater and toe the lead line under or around bottom features to prevent the net from being lifted off the bottom as the fish become ensnared. Fish may also be chased into the net by divers. Entire schools of fish may be caught using this method. While fishing the net must be constantly monitored to reduce bycatch of unwanted fish species and sea turtles.

d. Trammel net (mallorquin, chinchorro de fondo, or tres paZos): this net has three curtains of netting which are suspended from a common cork line and attached to a single bottom or lead line. The two outside curtains or panels are of a larger mesh size than that of the inside panel. The inside net has a greater length and hangs loosely between the two outer panels. It is generally used anchored to the bottom. This type of net is primarily used on St. Croix.

In St. Croix District, trammel nets are used as a bottom net to catch primarily schooling parrotfish species. The techniques to set and fish the nets are the same as previously discussed for bottom gill nets. Fish are typically not gilled in trammel nets. The fish swim through the outer larger mesh, hit the inner smaller mesh and push the smaller mesh through the opposite wall of larger mesh to form a bag in which they are trapped. As with bottom gill nets for parrotfish, the nets are set in the afternoon and hauled after dark. The catch is left in the net when it is hauled aboard the boat and is not removed until after the fisher trailers his vessel home, where the net is picked and the catch is iced in coolers.

e. Cast net (atarraya, tarraya, sardinera when used for sardines, jareera when used for ballyhoo) (Appendix III, photos 1 & 3 – 5): The names are applied according to the size of mesh which, in turn, depend on the species and/or size of the fish to be caught. For example, sprat cast nets have larger mesh (1/4" mesh) than fry (*Jenkensia* spp.) cast nets (1/8" mesh). This is a throw net used to catch small fish for bait and is circular, or cone-shaped, in appearance. The diameter, or spread, is twice the total length of the net. In Puerto Rico, commercial fishermen measure the length of the cast net using the greatest width of the distance of a spread hand (from the tip of the thumb to the tip of the little finger) calling these units "cuartas" (approximately 8 to 9 inches). In St. Thomas/St. John the net is measured according to its size when the net is opened.

f. Umbrella net: This is a type of lift net where fish are attracted by light or bait and are captured in nets consisting of a horizontal netting or bag shaped like a paralleleped, pyramid or cone with the opening facing upwards. After being submerged, the nets are lifted or hauled out of the water, by hand or mechanically, from the shore or from a boat. The fish are retained in the net when the water runs away (description from Nedelec, 1982). In St. Croix District, this method is typically used to catch mackerel scad (*Decapterus macarellus*) and round scad (*D. punctatus*) commonly referred to as round robin.

g. Ballyhoo net: This is a special type of haul seine or floating gill net that averages about 400 feet in length and 13 feet in height. Ballyhoo nets have a mesh size of about 0.5 inch bar mesh.

2. Lines

a. Hand lines: This is the most commonly used gear when anchor or drift fishing. It consists of a concave plastic spool about 6" to 9" in diameter around which monofilament line is coiled. The strength of the monofilament line varies with the fish species being targeted. On average fishers use 2 or 3 hooks per line. The line is weighted with lead. The amount of lead varies depending on the current and on whether the fisher is drift fishing at the surface or bottom fishing.

b. Rod and reel: This gear is much less commonly used by commercial fishers in the US Virgin Islands. It is used most frequently by commercial fishers trolling for pelagic fish such as tuna, king mackerel, wahoo and dolphin, especially fishers who charter their vessels or who work as captains of charter vessels. It is sometimes used by fishers when they drift or anchor fish.

c. Surface longline: consists of a main line usually 1000 to 1,500 feet in length, buoyed at both ends, to which "snoods" (FAO, 1982), also known as branch lines (short lines usually with single hook or multiple hooks) are attached at various intervals. A fisher may drop up to 10 long lines. Once all 10 lines are deployed, the lines are picked up starting with the first deployed in a continuous cycle. This type of fishing is not used in St. Croix District. Much longer surface long lines up to 40 miles in length with 400 hooks are used to harvest swordfish and tunas. None of the fishers interviewed currently actively use this type of surface longline though at one fisher in St. Croix District reported owning this type of gear.

d. Bottom longline: Bottom long lines are similar to surface long lines in construction but they are weighted at both ends using large lead balls or weights and are fished various distances above the bottom. A surface buoy is attached to one end of the long line to keep track of its position and to haul the line. They are typically used for fishing for deepwater snapper and grouper.

e. Vertical setline - multihook: This gear is usually used to catch deepwater snapper/grouper in the USVI. It consists of a line that varies between 600 to 1,500 feet in length depending on the species fished. Each line is weighted with lead and has 25-30 hooks usually baited with squid. Circle hooks are commonly used to minimize the hooks catching on the bottom. Circle hooks are also used because the angler does not set the hook – the fish swallows the bait and the circle hooks are worked into the corner of the mouth by the pull of the fish on the line. The fish sets the hook as opposed to the fisher.

Multiple lines are often set from a boat using downriggers. Alternatively they can be buoyed and released (Olsen, et al., 1974). Because of the depth of the water, this gear is usually used while drift fishing. Lines are pulled and redeployed one after another on a cycle because fishers cannot tell if fish are biting on the line owing to the water depth. Short sets are required to minimize destruction of gear and loss of catch by sharks (Olsen, et al., 1974). Several float lines may be set to fish a larger area until fish are located. Once fish are located, the fisher can concentrate on fishing several lines from the vessel. Chemical light sticks or battery operated lights may be attached above the hooks as an attractor.

Another version of the vertical setline is the use of 1" PVC pipe as a "tree" rig. Holes are drilled in the PVC pipe to accommodate hook leaders branching off the PVC pipe. The pipe is weighted at the bottom and buoyed with a small pressure float to keep the gear vertical in the water on the bottom.

Vertical setlines may be fished from a boat and hauled to the surface with mechanical, hand crank reels or electric reels (called bandit reels) or with hydraulic reels. During retrieval, the buoys can be unsnapped from the mainline and the line attached to the reel and reeled in.

f. Vertical setline (single hook for pelagics): This gear is similar to the vertical setline – multihook except that a single large hook is used. This gear is commonly used in St. Croix District while fishing for tuna, dolphin and wahoo offshore, particularly around FADs. The fishing is done from a drifting vessel and starts at some point up current so that the fishing effort takes place along a pre-determined route. Lines may be deployed from the up current location or one line may be deployed while the vessel motors slowly up current to start the drift. Live bait or dead bait may be used. Lines may be unweighted, weighted with lead to keep the bait down or fished from a downrigger to keep the bait at a specific depth. One or more lines may be used.

A similar technique with live bait may be used to catch schooling dolphin that are feeding offshore, not associated with FADs. Live bait (sprat) is used to attract the fish near the boat while lines are deployed. As the dolphin move away the fish are chased and the technique repeated.

g. Trolling (silga, corrida, de alambrada, or currican): a line with one or more barbed hooks at the end, baited with either a natural or an artificial lure and towed behind a moving boat. Both handlines and rods and reels are used for trolling. This may be done at the surface or subsurface with wire line and downriggers.

h. Drift fishing: As indicated in the name, the boat is not anchored or powered, but allow to drift. A rod and reel or more commonly a handline is used with usually one or two hooks baited with squid or sprat (sardines).

i. Floating or Tailing: This type of fishing is used in the USVI to fish for yellowtail snapper (*Ocyurus chrysurus*) and "hardnose" (Blue runner, *Caranx crysos*) The boat is always anchored. Fish are attracted to the anchored boat using chum made of sand and fry (*Jenkensia and Anchoa* spp.) mashed together. Handlines with a single hook or multiple hooks and no sinker or, if the

current is strong, a small sinker are used to catch the fish attracted by the chum. Sprat, squid or blue fry are used as bait.

j. Drift banking: a special type of bottom or mid-water column drift fishing used in the USVI. A swivel is installed on the line along just above the 3 to 5 hooks used in this method of fishing. The lines are weighted with lead (size of weight depends on depth fished and the weather or current strength).

k. Anchor fishing: As indicated in the name, the boat used by the fisher(s) is anchored and either a hand line or rod and reel is used to fish. An average of 1-2 hooks is used and the line is weighted depending on the weather or strength of the current. The hooks are usually baited with blue fry (*Jenkensia* spp.), sprat (sardine) or squid. In the USVI this type of fishing is known as "bottom fishing." Sometimes in St. Thomas/St. John a fishing method known as "balla" is used. In this method hooks are baited with a combination of sand and fry mashed together and pressed around a hook. When the hook and bait reaches the bottom it attracts fish.

l. "Tuna buoy" fishing: This is a specialized type of line fishing often carried out in the vicinity of FADs. A plastic hand reel with a line is inserted over a bullet buoy or other suitable buoy by passing a piece of stainless steel all-thread through the float and hand reel. A circle of wood with a hole drilled in it to accommodate the all-thread is placed at the top of the float and beneath the hand reel to act as a large washer. A nut screwed into the all-thread at the top and a wing nut at the bottom holds the gear together. The wing nut at the bottom allows the hand reel to be quickly removed when a fish is hooked. A piece of inner tube is wrapped around the line on the hand reel to keep the line from spooling off the by itself. The hand reel is spooled with 60 to 100 pound test monofilament line to which is attached a single hook. Live or dead/cut bait may be used. Weights may be used to keep the line down. Leader wire may be used if sharp-toothed predators are present. Several reel buoys are set adrift and tracked closely. The fisher may troll in the vicinity of the reel-buoys while he waits for a strike. Alternatively, the tuna buoy may be deployed up current while the vessel is trolling. When a fish bites the hook and runs with the bait, the buoy spins sending up a fountain of water, alerting the fisher. The fisher then grabs the buoy and reel and pulls in the fish. When two fishers are present on the boat, one fisher fights the fish while the other coils the line back onto the hand reel. This fishing method is most commonly used to catch yellowfin tuna.

m. Jigging: consists of a handline or rod and reel in which a weighted line or line with a bottom weight and several hooks are deployed to the bottom or to some depth and then jigged up and down as it is being retrieved. The method is commonly used during the day or at night with a light to catch jacks (big eye scad) or other baitfish. Rigs or home-tied flies may be used which imitate the small crustaceans, which are attracted to the light at night. Jigging with a heavy line is also done to catch schooling tuna offshore around FADs. This method is seldom used in St. Thomas/St. John District.

3. Pots

a. Fish pot (nasa, a pot with arrow-head or chevron-shaped design nasa tipo flecha forma de estrella, corazón, triangular and/or tipo casa) (Appendix III, photos 8 – 17): a variety of designs and materials are used to make fish pots in the Virgin Islands. In St. Thomas/St. John District, fish pots are usually made of plastic/vinyl coated 2" square wire framed with steel reinforcing rods. 2" mesh is the minimum legal size in St. Thomas/St. John District. The traps are often square (4' x 4' x 1.5' or 2' in height), rectangular, arrowhead (chevron), or Z (S) shaped with one or two downward facing curving entry funnels. In St. Croix District, traps are similarly constructed. However, many fishers use 1.5" square or hexagonal mesh. Owing to fisher lobbying on St. Croix, the minimum legal mesh size on St. Croix is 1.5" hexagonal mesh. 1.5" square mesh is not legal in either territorial or federal waters, but it is still sometimes used on St. Croix. Fish pots on St. Croix are commonly built with galvanized wire mesh and may be constructed using wood for frames. Territorial regulations require one escape panel fastened by biodegradable material while federal regulations require two similarly fastened doors. The purpose of the regulation is to ensure that lost traps do not continue "fishing" (commonly referred to as ghost fishing), depleting the resource. However, data from diving on traps indicated that fishers rarely fasten the escape panels with biodegradable material (J. Vasques, pers. com.).

b. Lobster pot (cajón): Two types of lobster pot are used in St. Thomas/St. John District: modified fish pots and plastic lobster pots.

Modified fish pots: used as lobster pots are identical to fish pots except that an opening, usually about 6" in diameter, is cut in the top of the trap allowing lobsters to access the downward facing fish trap funnel. Lobsters crawl onto the top of the trap and enter the funnel through the opening on the top.

*Plastic slatted lobster pot (*Appendix III, photos 18 – 21)*:* These are commercially available traps imported from Florida. The traps have plastic slats on the sides and bottom and a wooden lid. This gear is only used in St. Thomas/St. John District, where it is replacing the modified lobster pots previously used by fishers because it is more cost effective and lasts longer. The wooden lids provided by the manufacturer are considered too fragile and they are usually replaced with thicker lids (< ¼" plywood) of a similar design by local fishers. Also two slabs of concrete are usually placed inside the trap on either side on the bottom to weight the trap. A plastic lobster pot costs $60.00 per pot but a minimum of 20 must be purchased at one time from the St. Thomas vendor.

c: Shrimp pot: used to catch deepwater shrimp. These pots are rectangular in shape, measuring 3' x 2' x 1.5'. The pots are made with ¾" square plastic coated wire mesh. They were only recorded from St. Croix, where they are fished in deepwater off the edge of the insular shelf.

4. Diving Gears

a. Spear (fisga, arpón, and tridente): these include hand spears as well as the spear gun (Appendix III, photos 28 – 30).

b. Gaff (bichero): a metal or wooden rod to which is attached a large barbless fish hook which was once used to catch lobster (it is illegal – VI Code, Title 12).

c. Snare (lazo): a short metal or wooden rod to which soft, pliable, wire is looped to form a lasso. Used by lobster divers.

d. Bag (saco): usually a nylon dive bag used to collect the queen conch and whelk.

e. PVC pipe lobster attractor: This a relatively new method used by primarily by scuba divers in St. Thomas/St. John District to attract and catch lobsters. A 6" diameter PVC pipe approximately 3 feet long is capped off at one end and a number of approximately 1/2" diameter holes are drilled through the sides of the pipe. Salted cow skin is jammed into the capped end of the pipe and the pipe is set with the opening facing a lobster hole. Lobsters crawl into the pipe, attracted by the cow skin. Divers check the pipes every 2-3 days. If lobsters are present in the pipe they take the pipe to the surface and shake out the lobsters returning the pipe to the bottom. Up to six lobsters may be found in a single pipe.

f. Nets: Scuba gear is used in conjunction with nets by fishers on St. Croix (see descriptions of gill nets and trammel nets above). Divers herd schools of fish into nets.

Appendix III
Photos of Fishing Gears of the US Virgin Islands

Net Fishing

Photo 1: St. Thomas, USVI. Fisher at the St. Thomas Frenchtown fishers' landing shows a "fry" net, which is commonly used in the US Virgin Islands to catch bait.

Photo 2: St. Thomas, USVI. A typical net used to catch ballyhoo (*Hemiramphis brasiliensis).*

Photo 3: St. Croix, USVI. Commercial cast net showing bait fish caught using the net.

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Photos 4 and 5: St. Croix, USVI. Fisher throwing cast net and hauling it in.

Photo 6: St. Croix, USVI. Gill net used to catch reef fish.

Photo 7: St. Croix, USVI. Gill net used to catch reef fish. A fishing boat is in the background.

Trap Fishing
- Fish Traps

Photo 8: St. Thomas, USVI: Typical arrowhead or chevron fish trap constructed of a welded rebar frame and 2" square plastic coated wire mesh. There is one downward facing funnel.

Photo 9: St. Thomas, USVI: Another view of the same trap as in photo 8 showing the method of construction more clearly.

Photo 10: St. Thomas, USVI: An arrowhead or chevron fish trap constructed of rebar and 2" plastic coated wire mesh with wood bracing.

Photo 11: St. Thomas, USVI: Pile of traps ready for deployment.

Photo 12: St. Thomas, USVI: Square trap with 2" plastic coated wire mesh and a steel reinforcing rod frame.

Photo 13: St. Thomas, USVI. Square metal trap design showing funnel.

Photo 14: St. Thomas, USVI: Square trap with bait container attached.

Photo 15: St. Croix, USVI. Arrowhead trap of galvanized wire with boat used for fishing in background.

Photo 16: St. Thomas USVI. Arrowhead trap of galvanized wire.

Photo 17: St. Croix, USVI. Arrowhead trap of galvanized wire and 1½" square mesh (this is not legal sized mesh on St. Croix).

- Plastic lobster traps

Photo 18: St. Thomas, USVI. Plastic lobster traps (pots) being assembled.

Photo 19: St. Thomas, USVI. Plastic lobster pots showing wooden lid and yellow plastic tag indicating that the trap has been inspected.

Photo 20: St. Thomas, USVI. Plastic lobster pots showing how wooden lid is removed. Concrete slabs are placed inside trap to weigh the trap down.

Photo 21: St. Thomas, USVI. Plastic lobster pots showing interior of trap with concrete slabs.

Photo 22: A typical pot hauler used to haul both fish and lobster traps.

Photo 23: St. Thomas USVI: Type of boat used in commercial trap fishery.

Photo 25: St. Thomas, USVI. Small single engine boat modified by the addition of a cabin.

Photo 24: St. Thomas, USVI: Typical small (18-20'), single engine, open boat used by commercial fishers in St. Thomas/St. John District.

Photo 26: St. Thomas, USVI: Larger sized boats with trap haulers are used to fish traps that are deployed farther off shore near the shelf edge.

Photo 27: St. Thomas, USVI. Frenchtown commercial fishers' landing site. Boat in middle is a trap fishing boat with pot (trap) hauler. The metal sheet on side of boat is to protect the fiberglass when pots are hauled.

Spearfishing

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Photos 28, 29, 30: St. Croix, USVI. Showing typical spear gun used for spearing reef fish.

Photo 31: Typical fish species caught by spear fishermen.

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Conch Fishing

Photo 32: St. Croix, USVI. A conch midden in the Aulucroix Channel by the Molasses Dock. Conch fishers in the USVI are required to bring the conch to shore before removing the meat from the shell.

Lobster Fishing

Photo 33: St. Croix, USVI. Fisher holding spiny lobster (*Panulirus argus*) with snare. Fishers use this device to catch lobsters while skin or scuba diving.

Photo 34: St. Croix, USVI. Lobster catch from fisher being weighed as part of the DPNR/Division of Fish and Wildlife's biostatistical program.

Photo 35: St. Croix, USVI. Fisher selling spiny lobster (*Panulirus argus*) in St. Croix Villa LaReine fish market.