PILOT SURVEY OF BOAT BASED RECREATIONAL FISHERS IN THE U.S. VIRGIN ISLANDS - 2013

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List of Acronyms

ACLs	Annual Catch Limits
AMs	Accountability Measures
BVI	British Virgin Islands
CCRs	Commercial Catch Reports
CFMC	Caribbean Fishery Management Council
DEE	Division of Environmental Enforcement
DFW	Division of Fish and Wildlife
DPNR	Department of Planning and Natural Resources
EEZ	Exclusive Economic Zone
FADs	Fish Attraction Devices
HMS	Highly Migratory Species
MPAs	Marine Protected Areas
MRFSS	Marine Recreational Fishery Statistics Survey
MRIP	Marine Recreational Information Program
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NSAR	National Saltwater Angler Registry
QA/QC	Quality Assurance/Quality Control
SD	Standard Deviation
SEFSC	Southeast Fisheries Science Center
STT/STJ	St. Thomas/St. John
STX	St. Croix District
USFWS	United States Fish and Wildlife Service
USVI	United States Virgin Islands
VI	Virgin Islands

Executive Summary

A study was conducted to determine if the annual vessel registration list maintained by the Government of the US Virgin Islands (USVI), Division of Environmental Enforcement (DEE), could be used as a frame to characterize boat-based recreational fishing in the USVI. A survey questionnaire was developed to collect basic information on recreational fishers and their fishing effort. Pilot telephone and mail surveys were conducted of boat-based recreational fishers to identify if either method was viable in establishing a mode of conducting continuous MRIP sampling in the U.S. Virgin Islands. The 2013 USVI boater registration list was compared to the National Marine Fisheries Service Highly Migratory Species (HMS) and National Saltwater Anglers Registry (NSAR) list for the same period.

Four hundred boaters were randomly selected from the 2013 boater registration database in each district (200 for phone interviews and 200 for mailed questionnaires) for a total sample size of 800. However, the sample size was reduced to 769 for several reasons:

- Some registered boaters owned more than one boat and were listed more than once on the mail or phone list of boaters to be sampled.
- Some registered boaters were on both the mail and phone list and only responded to the mail survey. This duplication of names was not detected prior to the commencement of the surveys.
- Eight registered boat owners surveyed in the summer of 2014 in each district (4%) said that they had not owned a boat in 2013.

To determine if an incentive would increase participation in the mail survey, a $2.00 incentive was provided to half of the boaters from each district selected for the mail survey.

Recreational fishers included fishers who not only reported that they recreationally fished, but also three fishers who said they only subsistence fished, and fishers who also were licensed commercial fishers and charter fishers. Of the 769 boat registrants sampled who owned a boat, 47% (378) completed the questionnaire. Of these 378 respondents, 38% (145) were recreational fishers. The total number of individuals who responded that they recreationally fished in the phone and mail survey was 50 of 190 (26%) and 31 of 195 (16%), respectively, for the St. Croix District (STX), and 32 of 191 (17%) and 32 of 195 (16%), respectively, for the St. Thomas/St. John District (STT/STJ).

The USVI mail surveys that included a $2.00 incentive had a slightly higher response rate (58% returned) than the mail surveys without the $2.00 incentive (52% returned). The response rate on STT/STJ was almost the same with (60%) and without (59%) the incentive, while the response rate was higher on STX with the incentive (54%) vs without (46%). There was a higher response rate for telephone interviews (60%) compared with mail surveys (40%).

Eighty-one vessels from the USVI were registered and obtained permits in 2013 to fish in federal waters for HMS species. Of this total, 38% (31) were from STT/STJ and 35% (28) were from STX. Stateside vessels and vessels from Puerto Rico and the BVI represented 18%, 4% and 5%, of HMS registered boaters, respectively. Of those vessels registered in the HMS Virgin Islands database, 71% of the registrants residing in STT/STJ and 86% residing in STX were listed in the VI-DPNR boater registration database. The 2013 NSAR had 1,017 individual anglers and 16 For-Hire vessels registered to fish in federal waters of the USVI. Boat registrants from STT/STJ and STX represented only 1%, respectively, of that total compared to 18% registered from Puerto Rico. The majority of the registrants represented a transient stateside recreational fishing population (80%). Only one registrant in the NSAR database from STT/STJ and five registrants from STX had vessels registered in the VI-DPNR boater registration.

Ninety-six percent of respondents in both districts owned a boat sometime in 2013. The total percentage of respondent boaters in the USVI who recreationally fished was 37%. A higher percentage of boaters in STX indicated they were recreational fishers (42%) than STT/STJ (32%). Five percent of fishers in STT/STJ and STX who recreationally fished also stated that they commercially fish. Most commercial fishers reported their recreational catches on their Commercial Catch Reports (CCRs). Ninety-five percent of the respondents from both districts used their own boat most of the time when they fished, including charter and commercial fishers. Obtaining food, having fun and relaxing, and for sport were the most important reasons people fished in the USVI. Fishers reported obtaining an average of 8.9% of their household's food from recreational fishing. Powerboats were the primary type of boat used for recreational fishing in the USVI, used by 81% of recreational fishers, and sail boats were a distant second, used by only 16% of fishers. Jet skis and kayaks were seldom used for recreational fishing. The mean length of power boats used for recreational fishing in the USVI was 21.4 ft. Sail boats were generally larger with a mean size of 39.7 ft.

Fishers were asked if they fished solely in territorial or federal waters or if they fished in both jurisdictions. More STX fishers fished in solely in territorial waters than STT/STJ fishers (54% vs 33%, respectively). Sixteen percent of USVI fishers (20% on STT/STJ and 12% on STX) solely fished in federal waters. Combining these values with those who fished both > and < 3 miles significantly increased the percentages (85% of fishers in the USVI fishing < 3 miles from shore and 56% fishing > 3 miles from shore). Fishers who said they fished in both territorial and federal waters, were asked the percentage of time they fished in each jurisdiction. STT/STJ fishers fished more in territorial waters (57%, SD = 21.4) than federal waters (43%, SD = 21.4). In contrast, STX fishers who fished in both territorial and federal waters spent more time fishing in federal waters (57%, SD = 24.05) than territorial waters (43%, SD = 24.05). The mean percent of time all respondents fished <3 miles in the USVI is 50.6% (SD = 23.5) and 49.4% (SD = 23.5) for >3 miles.

Government maintained boat ramps were the most commonly used facilities for landing fish, followed by marinas/yacht clubs. Fishers in STX used government improved public boat ramps much more frequently than in STT/STJ. Fishers on STX often used more

than one government improved boat ramp, while in STT/STJ no fisher indicated using more than one ramp. The most common time of day that boat-based recreational fishers in the USVI landed fish was 9 am to 9 pm with a peak landing period from 3 – 6pm. The mean length of an average recreational fishing trip in the USVI was 4.4 hrs with a mean of 3.3 trips per month. Fourteen percent of the Virgin Islands respondents participated in recreational fishing tournaments (22% from STT/STJ and 6% from STX). The mean annual number of tournaments participated in by anglers who fished in tournaments in the USVI was 2.8.

Some variations in popularity of fishing methods existed between districts. Offshore trolling, inshore trolling and shallow bottom fishing had the highest participation rates in STT/STJ (65%, 61%, and 52%, respectively) and offshore trolling, shallow bottom fishing and inshore trolling had the highest participation rates in STX (55%, 54% and 42%, respectively). By order of fishing effort, the top five targeted families include Scombridae (54%), Lutjanidae (49%), Coryphaenidae (37%), Serranidae (32%) and Carangidae (23%).

St. Croix recreational fishers identified Marine Protected Areas, Overfishing and Weather as the three most important issues affecting their recreational fishing experience at nearly equal priority (13%, 12% and 12%, respectively). Overfishing (23%), Enforcement (13%) and Environmental Degradation (11%) were cited by STT/STJ fishers as the three most important issues affecting their recreational fishing experience.

Respondents identified, in order of priority, their preferred method of contact for future surveys was phone (43%), mail (35%), Email (21%) and in person (6%). The response rate by boaters was greater in the phone survey (60%) than in the mail survey (40%) and the responses to the phone survey were often more complete and/or comprehensive than to the mail survey.

The Need for Regulations regarding recreational fishing was identified by fishers as the most important additional comment write-in issue with 23 specific comments (18% of total comments).

Introduction

Saltwater recreational fishing is one of the most important outdoors activities in the U.S. Virgin Islands (USVI) (CFMC 1985; Griffith et al. 1988; Hinkey et al. 1994; Friedlander and Contillo 1994; Adams et al. 1996; Friedlander 1995). Telephone surveys conducted by Jennings (1992), Eastern Caribbean Center (2002) and Mateo (2004) indicate that as much as 10% of the population participates in recreational fishing. Besides personal enjoyment and providing an important source of household dietary protein, recreational fishing activities also contribute significantly to the Virgin Islands economy. Hinkey et al. (1994) estimated that more than $25 million dollars were spent on activities associated with recreational fishing, primarily during the seasonal blue marlin fishery.

Several categories of recreational fishing have been identified, including charter boat, private boat (both inshore and offshore) and shore and pier (Jennings 1992; Mateo 2004). The recreational line fishery targets offshore, inshore and reef fish fisheries (Adams et al. 1996; Mateo et. al. 2000; Toller et al. 2005). By censusing individuals from a recreational boaters' registration list, Tobias and Dupigny (2009) determined that 38% of the U.S. Virgin Islands recreational powerboat owners with vessels greater than 16 feet fish recreationally for marlin and pelagic fish species.

Although separated by a distance of only 40 miles, significant differences exist between the recreational fisheries of St. Croix and the three major northern Virgin Islands, St. Thomas, St. John and Water Island. These differences include island topography, bathymetry of adjacent waters, coastal platform size, fishing methods, resources and resource users (Griffith et al. 1988; Brandon 1989; Hinkey et al. 1994; Friedlander and Contillo 1994; Tobias 1994; Adams 1995; Friedlander 1995; Garcia-Moliner et al. 2002).

The USVI developed a recreational fisheries port sampling program in 1981 and has used various methods, including telephone surveys, socio-economic surveys, logbooks, shoreline roving creel surveys, dockside interviews and fishing tournaments, to collect data on recreational fishing activities (Tobias 1985 and 1991; Brandon 1989; Jennings 1992; Adams 1995; Adams et al. 1996; Mateo 2004; Toller et al. 2005). However, a continuous, statistically valid survey methodology and resulting long-term estimates of recreational catch and effort is lacking. Early federal attempts by the National Marine Fisheries Service (NMFS) to collect catch and effort date through the Marine Recreation Fisheries Statistics Survey (MRFSS) from 1979 to 1981 and from 1999 to 2001 in St. Thomas were unsuccessful due to lack of funding and difficulty to recruit, hire and retain field interviewers (Munoz et al. 2013). Presently, the redirection of territorial program funding and reduction of staff have limited USVI recreational fisheries data collection to recreational fishing tournaments only (Toller et al. 2005), the majority of which are for coastal pelagic or pelagic fish species. Data on recreational landings of federally-managed resources, such as shallow water reef fish, is sparse or non-existent for lobster, conch and deep water snappers.

Federal mandates, as a result of the Magnuson-Stevens Fisheries Conservation and Management Reauthorization Act of 2007, required management plans for resources in federal waters of the Exclusive Economic Zone (EEZ) to eliminate overfishing by 2010 and all other managed stocks by 2011. Annual catch limits (ACLs) and accountability measures (AMs) are required for all managed species that comprise the commercial and recreational fishery. In order to establish viable ACLs that are equitable and fair to all U.S Caribbean user groups, it is essential to know the amount of harvest of the managed resources by recreational fishers. Although a draft USVI recreational fisher license program and recreational fishing regulations were developed by the St. Croix and St. Thomas/St. John Fisheries Advisory Committees (Tobias 2010), the program has not received government sanction. At the present time, USVI ACLs have been established for federally-managed species of the commercial fishery only.

The NMFS has recognized the need to collect statistically valid, long-term recreational fisheries data in the USVI. The NMFS Marine Recreational Information Program (MRIP) funded workshops in the US Caribbean to review the current MRIP program in Puerto Rico and to look at the potential of establishing MRIP in the USVI (Kojis and Tobias, 2012). Data needs and recommendations for collecting recreational fisheries data were identified in a report completed by MRIP consultants (Munoz et al. 2013).

This report presents the results of a MRIP pilot study, based on priority recommendations from Munoz et al. 2013, to determine if the annual vessel registration list maintained by the Government of the USVI, Division of Environmental Enforcement, could be used as a frame to characterize boat-based recreational fishing. A survey questionnaire was developed to collect basic recreational fishing effort information and a pilot telephone and mail survey conducted of boat-based recreational fishers to identify if either method was viable in establishing a mode of conducting continuous MRIP sampling in the U.S. Virgin Islands.

Materials and Methods

Task 1: Obtain and proof DPNR-DEE vessel registration database.

Vessel owners are required to register their vessels annually at the Division of Enforcement (DEE) offices in the districts of St. Croix and St. Thomas/St. John. An electronic MS Access database and hardcopies of all vessel registrations are housed and maintained at the Division of Environmental Enforcement offices. Vessel registration data from the most recent complete calendar year (2013) was requested and received from the DEE and converted to Excel format.

The converted Excel electronic vessel database was proofed with the individual hardcopy files catalogued by individual vessel registration numbers at the DEE. Criteria checked included vessel owner name, mailing address, phone number, residence, registration number, vessel make, boat type, boat length, home port, year manufactured, horsepower, engine type, year registered and DEE size class codes. Vessels in the DEE boater registration database capable of participating in the recreational fishery were identified and categorized by strata: powerboat, sailboat, rowboat, jet ski and kayak.

Task 2: Compare USVI vessel registration database with Highly Migratory Species (HMS) and National Saltwater Angler Registry (NSAR) databases.

Data extraction compliance requests were submitted to Randy Blankinship, Branch Chief, HMS Species Division and Scott Sauri, Science Information Division, NOAA, for U.S. Virgin Islands HMS and NSAR databases, respectively. The 2013 DEE vessel registration database was compared with HMS and NSAR electronic databases for compliance with private vessel and angler/For-Hire vessel permits, respectively.

Task 3: Determine recreational boat-based fishery sector sample sizes and develop a protocol for telephone and mail surveys.

Assistance was obtained from Dr. Virginia Lesser, Oregon State University, MRIP project consultant, to identify representative recreational boat-based fishery sample sizes for the vessel strata (powerboat, sailboat, rowboat, jet ski and kayak) and to identify the protocol for the telephone and mail surveys. A sample size of 400 was selected for each of the two districts (STT/STJ and STX). The 400 vessels were then selected to reflect the same proportion of vessel types within each of the two representative districts, STT/STJ and STX. In order to compare the mail and telephone approaches, this sample of 400 was split so that 200 were surveyed by mail and the remaining 200 by telephone.

Explanatory Pre-letter

The protocol for both the telephone and mail survey followed standard survey procedures (Dillman et al. 2014), which included preparing a bi-lingual pre-letter (Spanish/English), approved and signed by Roy Pemberton, Director, Department of Planning and Natural Resources (DPNR), Division of Fish and Wildlife (DFW), to the registered boat owners

selected in the survey (Telephone: Appx. II, Mail: Appx. III). The letter explained the purpose of the upcoming survey and requested their assistance in responding to either a telephone survey or mail survey. This letter was sent to all 800 individuals selected for the telephone and mail surveys.

Telephone Survey

Day 6/7 after pre-letter - Initiate phone contact attempts

A maximum of six attempts were made by telephone interviewers to contact individuals on different days and at different times of the day. Contact and no-contact results were recorded on a disposition sheet attached to each survey instrument (Appx VIII). All answers to questions by respondents were voluntary.

Mail Survey

Day 1 - Pre-survey postcard

The sample size for the mail survey was reduced based on the number of undeliverable pre-letters received from the post office. A postage-paid, self-addressed postcard was included with the introductory bi-lingual cover letter mailed to each of the selected individuals in the mail survey that appeared to have valid addresses asking if they wanted an English or Spanish version of the survey instrument (Appx. IV).

Day 6/7 after pre-survey postcard – Initiate first mailing

The first mail survey posting was initiated, irrespective of whether the pre-survey postcard had been returned. The mailing included a bi-lingual letter approved and signed by Director Pemberton (Appx. V), a bi-lingual version of the survey instrument (Appx. IX & X), if they requested a Spanish version or had a Hispanic last name, and a postage-paid, self-addressed return envelope. To compare the effectiveness of incentives on mail survey response rates, half of the individuals selected in the mail survey were randomly selected to receive a $2.00 bill as an incentive.

Day 13/14 after the first survey mailing - Follow-up postcard

A follow-up postcard was sent to individuals that did not return the survey as a reminder to complete the questionnaire (Appx. VI).

Day 28 after the first mailing - Second mailing

A second mailing was forwarded to only non-respondents. The second mailing contained a new DPNR-approved bi-lingual cover letter signed by Roy Pemberton (Appx VII), bi-lingual versions of the survey instrument, if they had requested a Spanish version or had a Hispanic last name, and a postage-paid, self-addressed return envelope. All survey documents and disposition of the survey were recorded when received from the

respondent. Responses that came in two months or more after the last survey mailing were recorded as late responses and not included in the database.

Task 4: Design and test a survey instrument to characterize the USVI boat-based recreational fishery.

A survey instrument was developed to characterize the boat-based recreational fishery with assistance from stakeholders, survey formats used to assess other tropical recreational fisheries (Anon. 2012), researchers involved in other Virgin Islands recreational fisheries research projects (Dr. Theresa Goedeke, NOAA), territorial and regional fisheries managers (MRIP Caribbean Team members Roy Pemberton, DPNR-DFW; Graciela Garcia-Moliner, Caribbean Fishery Management Council) and Dr. Virginia Lesser, Oregon State University, MRIP consultant for this project. Two separate survey instruments based on identical questions were required, one for the telephone survey and one for the mail survey, due to the different methods in contacting respondents and recording responses. Survey instruments were pre-tested on a minimum of 12 selected recreational boaters to identify problematic questions and to determine appropriate survey duration. The survey instruments were then further refined.

Task 5: Dissemination of information.

MRIP information was disseminated to the public in advance of the survey by multiple media methods. Two additional recreational fisheries projects on St. Croix, funded by the NOAA Coral Reef Conservation Program (CRCP), were scheduled to commence during the same period as the MRIP project. Drs. Theresa Goedeke, NOAA-NOS, and Jim Berkson, NOAA National Marine Fisheries Service (NMFS), received funding to conduct a shore-based recreational fisher survey and boat ramp intercept survey, respectively. To avoid confusion in the recreational fishing community, coordination and partnership with Drs. Goedeke and Berkson were essential wherever possible.

Presentations

The authors partnered with Dr. Goedeke at two public meetings held on September 10 and 12, 2013 by setting up an information station with a PowerPoint poster presentation about the MRIP survey.

The MRIP project was presented to the St. Croix Fisheries Advisory Committee (STX-FAC) in December 2013. Also, in attendance were Lia Ortiz and Marlon Hibbert, NOAA Coral Reef Conservation Program (CRCP). Project updates were provided at STX-FAC meetings in February and May 2014.

A MRIP PowerPoint presentation was given to the Caribbean Fishery Management Council on April 23, 2014 in St. Croix.

Discussions

The authors discussed fisheries research project status, timelines and coordination with CRCP Project Leaders Goedeke and Berkson on January 17, 2014 and Goedeke on March 27, 2014. Areas of research connectivity between the projects were identified and the MRIP survey instrument modified to incorporate data collection needs.

Public Media

A public service announcement on the MRIP project was prepared, approved by the Government of the Virgin Islands, Department of Planning and Natural Resources, and published in the St. Croix Avis and St. Thomas Daily News newspapers on May 25 and 26 and June 1 and 2, 2014. The public service announcement was also distributed to St. Croix and St. Thomas/St. John boaters by the Division of Environmental Enforcement during the vessel registration period starting in June 2014.

NOAA Newsletter

Information on the MRIP Virgin Islands project was provided to Ms. Alicia Clarke, NOAA Center for Coastal Monitoring and Assessment, for publication in their newsletter.

Task 6: Hire and train telephone interviewers and mail assistance.

Two Virgin Islands residents, former Government of the Virgin Islands DPNR employees familiar with regional fisheries and local fishers, were hired as telephone interviewers. An interviewer workshop was conducted in April 2014 to familiarize the individuals with MRIP, the telephone survey guidelines, respondent contact sheet and survey contact list. The contact list contained an equal number of registered boaters for 2013 from the St. Thomas/St. John and St. Croix districts. Interviewers were asked to conduct several practice interviews to familiarize themselves with the survey instrument and identify problematic areas. A second workshop was conducted on May 21 to review the survey instrument again, field questions, identify the startup date and distribute questionnaires. An individual was also hired to provide assistance processing the telephone and mail survey pre-letters and two mail survey mailings.

Task 7. Conduct telephone and mail surveys and compare response rates.

The general methodology and timetable for the telephone and mail surveys is provided in Table 1.

Telephone Survey

Telephone survey interviews were started May 28, 2014 and completed on August 13, 2014. A slight delay of two days was experienced in starting the telephone survey due to questions on the survey instrument by one telephone interviewer and work schedule

priorities experienced by the other telephone interviewer. Individuals selected for the survey were told that their participation in the study was voluntary and that they may skip any questions they choose not to answer. All interviews were identified as either complete (recreational fisher-full interview), partial (incomplete interview – respondent did not own a boat in 2013, did not recreationally fish or only fished commercially) or incomplete (no contact after six attempts). The disposition of each interview was recorded on the interview survey and entered onto an Excel spreadsheet. Data was entered in an Excel spreadsheet established for each of the question responses. Quality assurance/quality control (QA/QC) was maintained by having only one individual enter data and conduct routine data checks. At the completion of all telephone interviews, the data in the Excel databases were verified with each of the hard copy questionnaires. Responses that were questionable were referred back to the original telephone interviewer for verification with the respondent.

Mail Survey

The first mail questionnaire was mailed on June 13, 2014. Similar to the telephone survey, participants were told that their participation in the study was voluntary and that they may skip any question that they choose not to answer. All mail survey responses were identified as complete, partial, no response (no postcard or no survey returned) or undeliverable. The disposition of each mail survey, including U.S. Postal Service notification as to why the survey was not deliverable, was entered onto an Excel spreadsheet. An Excel spreadsheet was established for each of the question responses. Follow-up reminder postcards were sent to those individuals not responding to the first mailing of the questionnaire on July 31 (STT/STJ) and August 7, 2014 (STX). The different mail times for the two districts were because the US Postal Service did not have enough postcards initially and had to order more. Also, the order had to be placed a second time when the first order did not go through. A second questionnaire mailing only to non-respondents and initial no contacts was conducted on August 18, 2014. Delays were incurred in mailing both the first and second questionnaire due to delays in obtaining approved and signed cover letters from DPNR to accompany the mailings, $2.00 bills as incentives and postal supplies. The mail survey was terminated on October 14, 2014. QA/QC was maintained by having only one individual enter data and conduct routine data checks.

Survey Response Rates

Survey response rates from the telephone and mail survey, a measurement of the percent of qualified or eligible respondents who participated in the survey and the percent of respondents who recreationally fished, were compared using several methods including a response rate calculator published by the American Association for Public Opinion Research (http://www.aapor.org/For_Researchers/5850.htm#VAemZhbOeAo).

Table 1. An outline of the tasks and timetable for conducting the USVI mail and telephone surveys.

SURVEY	TIMING	EVENT
Phone Survey	Day 1 May 19, 2014	Send pre-letter - DFW letterhead - Director signature - Spanish translation
	Day 6-7 Proposed – May 26, 2014 Actual – May 28, 2014	Initiate contact attempts - Six contact attempts - Different days and times - Record contact disposition
Mail Survey	Day 1 May 30, 2014	Send pre-letter - DFW letterhead - Director signature - Spanish translation - Include post card for English or Spanish version of survey
	Day 6-7 Proposed – June 6, 2014 Actual – June 13, 2014	First mailing of survey - Bilingual cover letter - Questionnaire (1/2 with $2 incentive) - Stamped return envelope - Check off when survey received
	Day 13-14 Proposed – June 13 Actual – STT/STJ – July 31, 2014 STX – August 7, 2014	Send follow-up postcard
	Day 28 Proposed – June 30, 2014 Actual – August 18, 2014	Second mailing of survey (Non-respondents only) - New bilingual cover letter - Copy of questionnaire - Stamped return envelope - Check off when survey received

Results

Four hundred boaters were randomly selected from the 2013 boater registration database in each district (200 for phone interviews and 200 for mailed questionnaires) for a total sample size of 800 (Table 2). The DEE boater registration database from both districts had numerous individuals that registered more than one vessel. The files were examined to remove duplicates; however, there were several different spellings for some boat owner names and these duplicates were more difficult to identify. Four duplicates appeared on the St. Croix District (STX) phone list and one boater was on both the phone and mail lists and chose to complete a mail survey. Two duplicates appeared on the St. Thomas-St. John District (STT/STJ) phone list. A third boater was on both the phone and mail lists and chose to also complete a mail survey. Therefore, the phone sample size was reduced to 195 and 197 for STX and STT/STJ, respectively. Similarly, duplicate mail samples resulted in only 196 and 197 distinct boaters mailed questionnaires in STX and STT/STJ, respectively. Boat owners receiving duplicate mailings responded to only one questionnaire. Table 2 summarizes the above reduction in the sample size as well as the number of boaters responding to the phone interviews and mail surveys and the number of surveyed boaters who were recreational fishers.

The total number of individuals who responded that they recreationally fished in the phone and mail survey for STT/STJ was 32 and 32, respectively, and 50 and 31, respectively, for STX. Because all answers to questions by respondents were voluntary, the total respondents answering each question varied. One respondent in the STT/STJ phone survey only answered Questions 1-9, reducing the total number of possible respondents thereafter from 32 to 31. A mail survey respondent from STT/STJ did not answer Questions 3-8, reducing the number of possible respondents from 32 to 31 for those questions. Similarly, one respondent in the STX phone survey answered Questions 1-12 and a second respondent answered Questions 1-14, reducing the total number of possible respondents thereafter from 50 to 48.

Highly Migratory Species (HMS) Angler Registry

We also obtained the Highly Migratory Species (HMS) National Registry and the National Saltwater Angler Registry (NSAR) databases for the USVI to determine if the individuals registering to fish recreationally in waters under federal jurisdiction were included in the VI-DPNR boat registration database.

The National Marine Fisheries Service (NMFS), Highly Migratory Species Branch, had 81 vessels from the Virgin Islands that were registered and obtained permits in 2013 to fish in federal waters for HMS species (tuna, sharks, swordfish and billfish) (Table 3). Of this total, 38% (31) were from STT/STJ and 35% (28) were from STX. Stateside vessels and vessels from Puerto Rico and the BVI represented 18%, 4% and 5%, of HMS registered boaters, respectively. Vessels registered stateside represent a transient, seasonal fleet from June through September that fish in offshore billfish tournaments in the region. Of those vessels registered in the HMS Virgin Islands database, 71% of the

registrants residing in STT/STJ and 86% residing in STX were listed in the VI-DPNR boater registration database.

Table 2. The evolution of the sample size for the survey of boat based recreational fishers in the US Virgin Islands. Note: Shaded cells are to highlight the small changes in one row.

	STT/STJ				STX				USVI			
	Phone	**Mail**	**Total**	**% of Original Sample Size**	**Phone**	**Mail**	**Total**	**% of Original Sample Size**	**Phone**	**Mail**	**Total**	**% of Original Sample Size**
Original sample size	200	200	400	100%	200	200	400	100%	400	400	800	100%
Sample size minus duplicates	197[1]	197[2]	394	99%	195[3]	196[4]	391	98%	392	393	785	98%
Reduction owing to no boat ownership	191	195	386	97%	190	195	385	96%	381	390	770	96%
Reduction owing to respondent returning a blank questionnaire	191	195	386	97%	190	195	384	96%	381	389	769	96%
# responding to surveys who owned a boat	120	78	198	50%	104	74	178	45%	225	154	379	47%
# of respondents who were recreational fishers	32	32	64	16%	50[5]	31[6]	81	19%	82	63	145	17%

[1] Sample size was reduced owing to duplications: 1) two boat owners were duplicated on phone list (because they owned more than one boat) and 2) one boat owner was on both the mail and phone list and chose to complete the mail questionnaire.
[2] Sample size reduced because three boat owners were duplicated on mailing list.
[3] Sample size reduced owing to duplications: 1) four boat owners were duplicated on the phone list and 2) one boat owner was on both the phone and mail list and chose to do the mail survey.
[4] Sample size was reduced because four boat owners were duplicated on the phone list.
[5] Includes 3 subsistence only fishers.
[6] Includes 3 subsistence only fishers and one charter/commercial fisher.

Table 3. Comparison of the NMFS Highly Migratory Species (HMS) USVI database with VI-DPNR boater registration database for 2013.

Home Port[1]	Number and Percent of Registrants in the National Highly Migratory Species Angler Registry					Number and Percent of HMS Registrants also found in the USVI Boat Registration Database	
	Angling	Head-boat	General	Total N	%	N	%
STT/STJ	13	15	3	31	38%	24	71%
STX	14	5	9	28	35%	25	86%
Stateside	14	1	0	15	18%	0	0%
Puerto Rico	3	0	0	3	4%	0	0%
BVI[2]	3	1	0	4	5%	0	0%
Total				81	100%	49	

[1] Address of HMS Angler in registry
[2] BVI = British Virgin Islands

National Saltwater Angler Registry (NSAR)

The purpose of the NSAR registry is to provide a more accurate count of fishermen and their catch to help conserve the oceans and ensure the future of recreational fishing. Saltwater anglers in the USA and its territories are required to register with NSAR if they plan to fish in federal waters (>3 nm from shore) of the USA and/or its territories and do not possess a fishing license from any of the 49 states with approved fishing licenses. If they do have a license from one of the 49 states, they are automatically registered. Residents of Hawaii, the US Virgin Islands or Puerto Rico must register with NSAR if they plan to fish in federal waters.

There are exceptions to this requirement to obtain a license. These exceptions include:

1. if the state in which they reside does not require them to get a license because of, for example, disability or active military service,
2. if they have a For-Hire vessel license from a state (not including Hawaii, USVI or Puerto Rico) or the federal government or plan only to fish on a For-Hire vessel in federal waters, and
3. if they are fishing on a vessel registered on the HMS Angler Registry.

The list of anglers we obtained from NSAR consisted of residents of the USVI and anglers who were residents of the 50 states or Puerto Rico, who checked the USVI as an intended fishing location (J. Pursel, NOAA, pers. com.). The 2013 NSAR had 1,017 individual anglers and 16 For-Hire vessels registered to fish in federal waters of the Virgin Islands for the calendar year 2013 (Table 4). Boat registrants from STT/STJ and STX represented only 1%, respectively, of that total compared to 18% registered from Puerto Rico. The majority of the registrants represented a transient stateside recreational fishing population (80%). Only one registrant in the NSAR database from STT/STJ and five registrants from STX had vessels registered in the VI-DPNR boater registration

database for 2013, representing 17% and 56% of NSAR registrants, respectively by district.

Table 4. National Oceanic and Atmospheric Administration, National Saltwater Angler Registry (NSAR) Virgin Islands database comparison with VI-DPNR boater registration database for the calendar year 2013.

NOAA National Saltwater Registry for the U.S. Virgin Islands						
Registrants location	**Individual Angler Registration**		**For-Hire Boat Registration**		**Registrants also found in VI Database**	
	N	**%**	**N**	**%**	**N**	**%**
STT/STJ	6	1%	0	0%	1	17%
STX	9	1%	0	0%	5	56%
Puerto Rico	182	18%	10	63%		
Stateside	820	80%	6	38%		
Total	1,017	100%	16	100%		

Question 1 – Boat Ownership

The first question of the survey verified whether the boat registrant had owned a boat during the time period targeted by this survey (January 1 – December 31, 2013).

Question 1: Have you owned a boat during the 12-month period beginning January 1, 2013 to December 31, 2013? Yes No (If response was no, the interview ended.)

Ninety-six percent of respondents in both St. Thomas/St. John District (STT/STJ) and St. Croix District (STX) owned a boat sometime in 2013 (Table 5).

For Question 1, STT/STJ had a higher response rate for both the telephone and mail surveys than STX. There were 209 boat owners and non-boat owners who responded to surveys on STT/STJ vs 186 boat owners and non-boat owners who responded on STX. More questionnaires (including non-boat owners) were completed by phone interviews than by mail surveys in both districts (STT/STJ: Phone: 129 (62%) vs Mail: 80 (38%) and STX 110 (59%) vs 76 (41%) (Table 5). Combining the data for both districts, the response rate for phone was 60% (239) and 40% (157) for mail surveys.

Table 5. *Question 1*: The number of respondents who owned boats at any time during January 1 – December 31, 2013.

Boat Ownership	Number and Percentage of Respondents									
	St. Thomas/St. John District				St. Croix District				USVI	
	Phone	Mail	Total	Percent	Phone	Mail	Total	Percent	N	Percent
Total contacted	197	197	394		195	196	391		785	
Owned a boat	123	78	201	96%	104	74	178	96%	379	96%
Did not own a boat	6	2	8	4%	6	2	8	4%	16	4%
Total # respondents	**129**	**80**	**209**	**100%**	**110**	**76**	**186**	**100%**	**395**	**100%**
Refusal	0	0	0	0%	0	1	1	0.5%	1	0.2%

Question 2 – Determined if Respondent a Recreational Fisher

The second question determined if the respondent recreationally fished. Charter fishing and subsistence fishing were considered types of recreational fishing. A commercial fisher could also recreationally fish.

Question 2: Have you used your boat(s) during the 12-month period beginning January 1, 2013 to December 31, 2013 for one or more of the following fishing activities?

a. Recreational Fishing 1 ☐ **YES** 2 ☐ **NO**

b. Charter Fishing 1 ☐ **YES** 2 ☐ **NO**

c. Subsistence Fishing 1 ☐ **YES** 2 ☐ **NO**

d. Commercial Fishing 1 ☐ **YES** 2 ☐ **NO**

The following definitions were provided to telephone interviewers and in the mail survey for the fishing activities listed above:

Commercial fishing *means you possess a commercial fishing license and a business license to sell fish caught from your boat.*

Recreational fishing *means you fish for personal enjoyment and do not sell fish but may give some away.*

Charter fishing *means you possess a USCG captain's license and passengers hire your vessel to recreationally fish.*

Subsistence fishing *means that you fish to put food on the table for you and your family. If you didn't catch fish your family may go hungry.*

If the respondent answered "no" to all of the above fishing activities or "yes" to only commercial fishing, the interview ended or respondent filling out the mail survey was informed that this was all the information needed at this time and asked to return the survey in the envelope provided.

The total percentage of respondent boater owners in the USVI who recreationally fished was 38% (Table 6). A higher percentage of boaters in STX indicated they were recreational fishers (45%) than STT/STJ (32%). A higher proportion of boaters on STT/STJ interviewed by mail indicated that they were recreational fishers (41%, 32 of 78) compared with boaters interviewed by phone (27%, 32 of 120). In contrast, a higher proportion of boaters on STX interviewed by phone (48%, 50 of 104) indicated that they were recreational fishers compared with boaters interviewed by mail (41%, 31 of 76). Combining data for both Districts, 36% (82 of 224) of boaters interviewed by phone were recreational fishers vs 41% (63 of 154) interviewed by mail

Table 6. *Question 2a:* The percentage of respondents that recreationally fished, broken down by phone and mail survey results. Respondents that did not own boats or refused to answer the question were excluded from the table.

Fishing Activities	Number and Percentage of Respondents									
	St. Thomas/St. John District				St. Croix District				USVI	
	Phone	Mail	Total	Percent[1]	Phone	Mail	Total	Percent*	N	Percent
Recreational fisher	32[2]	32	64	32%	50[3]	31	81	45%	145	38%
Not recreational fisher	88	46	134	68%	54	45	99	55%	233	62%
Total # boater owners responding	120	78	198	100%	104	76	180	100%	378	100%

[1]Based on total number of respondents for both phone and mail surveys for each district.
[2]Number of respondents in the STT/STJ phone interviews changed from 32 to 31 after Question 9 because one respondent chose not to answer any more questions.
[3]Number of respondents in the STX phone interviews changed from 50 to 48 after Question 14 because two respondents chose not to answer any more questions.

Of the boaters that said they fished on St. Thomas/St. John, 89% said they recreationally fished (Table 7). This included three commercial fishers who said they both commercially and recreationally fished. Two of the recreational fishers reported charter fishing and 26 of non-commercial recreational fishers reported fishing for subsistence. Two boaters reported fishing commercially, recreationally and for subsistence. Eight reported fishing commercially only.

Of the boaters that said they fished on St. Croix, 79% said they recreationally fished (Table 7). This included one commercial fisher who commercially and recreationally fished and one charter fisher who also commercially fished. Thirty-three non-commercial recreational fishers also fished for subsistence and five fishers only fished for

subsistence. Three boaters reported fishing commercially, recreationally and for subsistence. Thirteen reported fishing commercially only.

Table 7. *Question 2b-d:* The frequency with which respondents reported undertaking recreational, charter, subsistence and commercial fishing activities during the period January 1 – December 31, 2013. Some fishers indicated more than one activity, e.g. commercial and recreational fishing, recreational and subsistence fishing, etc. Note: All fishers who were not licensed commercial fishers and commercial fishers who said they recreationally fished were asked to complete the questionnaire.

Fishing Activities	Number and Percentage of Respondents									
	St. Thomas/St. John District				St. Croix District				USVI	
	Phone	Mail	Total	Percent[1]	Phone	Mail	Total	Percent[1]	N	Percent[1]
Recreational only	32	32	64	89%	47	27	74	79%	138	83%
Charter	1	1	2	3%	0	1	1	1%	3	2%
Subsistence	24	4	28	39%	37	5	42	45%	70	42%
Commercial	9[2]	2[3]	11	15%	12[4]	7[5]	19	20%	30[6]	18%
Total # respondents	38	34	72	146%	57	37	94	145%	166	145%

[1] Percent of respondents in each fishing category as compared to total # of respondents
[2] Includes six fishers who only commercially fished.
[3] Includes two fishers who only commercially fished.
[4] Includes seven fishers who only commercially fished.
[5] Includes six fishers who only commercially fished. One commercial fisher also charter fished.
[6] Includes 21 fishers who only commercially fished.

Questions 3 and 4 – Recreational Fishers Who Also Are Licensed Commercial Fishers

Fishers who said that they recreationally fished were asked if they had commercially fished in 2013 (Question 3). If they had commercially fished, they were asked if they recorded their recreationally caught fish on their catch reports (Question 4).

Question 3: Have you used your boat at any time during the 12-month period beginning January 1, 2013 to December 31, 2013 for commercial fishing?
(*Check one box then follow arrow to next question.)*

1 ☐ NO ➔ ***SKIP TO QUESTION 5.***

2 ☐ YES ***PROCEED TO QUESTION 4.***

Question 4: As a commercial fisher, do you record the fish that you catch recreationally (i.e., when fishing from your commercial boat for personal enjoyment only) on your commercial catch reports?

Five percent of fishers in STT/STJ (N = 3) and STX (N = 4) who recreationally fished, also stated that they commercially fish (Table 8). From this group of 7 anglers, 86% (67% in STT/STJ and 100% on STX) reported their recreational catches on their Commercial Catch Reports (CCRs).

Table 8. *Questions 3 and 4:* Frequency with which recreational fishers who commercially fished in 2013 reported their recreational catch on their Commercial Catch Reports (CCRs).

Fishing Activities	Number and Percentage of Respondents									
	St. Thomas/St. John District				St. Croix District				USVI	
	Phone	Mail	Total	Percent	Phone	Mail	Total	Percent	N	Percent
Commercially fished	3	0	3	5%[1]	3	1	4	5%[1]	7	5%[1]
Reported recreational catch on CCRs	2	0	2	67%	3	1	4	100%	6	86%
Did not report recreational catch on CCRs	1	0	1	33%	0	0	0	0%	1	14%
Total # Respondents	32	31[2]	63		50	28[3]	78		141	

[1] Percent of recreational fishers who also commercially fished.
[2] One STT/STJ fisher did not respond to the question.
[3] Three STX fishers did not respond to the question.

Question 5 – Whose Boat Was Used When Recreationally Fishing?

Fishers were asked the frequency with which they used their own boat, their own commercial boat, a friend's or family boat, hired a charter boat, rented a boat, or used their own charter boat (Question 5) (see Appx. VIII - X for complete question).

Question 5: We would like to find out whose boat you used when you fished during the 12-month period beginning January 1, 2013 to December 31, 2013.

Most recreational fishers used their own boat (95% of respondents in both districts) most of the time when they fished. When this category of boat ownership was selected, anglers selected 'Always' or 'Usually' as the most common description of the frequency of use (Tables 9 & 10). The second most common type of boat used for recreational fishing was a family or friend's boat (38% in STT/STJ and 28% in STX). When this boat type was selected, anglers selected 'Sometimes' as the most common description of the frequency of use. Commercial fishers who recreationally fished used their own commercial boat. Also, few used a rental boat, hired a charter boat or used their own charter boat (few charter boat owners were interviewed).

The category 'Always' was checked by fishers who also sometimes used other types of boats. "Always" was probably interpreted as 'Most of the time,' by some fishers. If this question is asked in the future and precise answers are considered important, the terminology should be clarified either by changing the categories of use or defining them.

Table 9. *Question 5*: Frequency of use of boats by type of owner by recreational fishers in St. Thomas/St. John District during 2013.

Boat Used in Recreational Fishing	Number of Fishers – St. Thomas/St. John District													
	Phone Survey						Mail Survey						Total	
	Always	Usually	Sometimes	Never	# of fishers who used type of boat at least sometimes	% using each type of boat	Always	Usually	Sometimes	Never	# of fishers who used type of boat at least sometimes	% using each type of boat	Sum of boat users for each type of boat	% Using each type of Boat
Own personal boat	30	0	0	2	30	94%	23	6	1	1	30	97%	60	95%
Commercial boat	3	0	0	29	3	9%	0	0	0	31	0	0%	3	5%
Boat owned by friends or family	1	2	10	19	13	41%	0	1	10	20	11	35%	24	38%
Hire a charter boat	0	0	1	31	1	3%	0	1	2	28	3	10%	4	6%
Rental boat with or without a captain	0	0	0	32	0	0%	0	1	1	29	2	6%	2	3%
Own charter boat	1	0	0	31	1	3%	0	3	0	28	3	10%	4	6%
# of Respondents					32						31[1]		63	

[1] One STT/STJ fisher did not respond to this question.

Table 10. *Question 5:* Frequency of use of boats by type of ownership by recreational fishers in St. Croix District during 2013.

Boats Used in Recreational Fishing	Number of Fishers – St. Croix District													
	Phone Survey						Mail Survey						Total	
	Always	Usually	Sometimes	Never	# of fishers who used type of boat at least sometimes	% using each type of boat	Always	Usually	Sometimes	Never	# of fishers who used type of boat at least sometimes	% using each type of boat	Sum of boat users for each type of boat	% Using each type of Boat
Own personal boat	45	1	2	2	48	96%	19	2	6	2	27	93%	75	95%
Commercial boat	5	0	0	45	5	10%	1	0	0	28	1	3%	6	8%
Boat owned by friends or family	1	0	13	36	14	28%	1	1	6	21	8	28%	22	28%
Hire a charter boat	0	0	3	47	3	6%	0	0	2	27	2	7%	5	6%
Rental boat with or without a captain	1	1	0	48	2	4%	0	0	0	29	0	0%	2	3%
Own charter boat	2	1	0	47	3	6%	1	0	0	28	1	3%	4	5%
# of Respondents					50						29[1]		79	

[1] Two STX fishers did not respond to the question.

Question 6 – Main Reasons for Recreationally Fishing

In order to obtain information on the boater's motivation to recreationally fish, fishers were provided seven specific reasons that were considered the most common reasons people fished (Tables 11 & 12) and space to include an "Other" reason. Respondents were asked to indicate the three main reasons in order of importance by placing a 1, 2 and 3 next to the reason (Appx. VIII - X – survey questionnaires). Telephone interviewers changed the order in which they asked the reasons for recreationally fishing so as not to introduce a selection bias by the respondent. Only one order was provided in the mail questionnaires.

Question 6: What are your three main reasons for recreationally fishing?

Six people completing the mail questionnaire on STT/STJ filled out their three reasons with only ones instead of one (primary reason), two (secondary reason), and three (tertiary reason). Two people placed a one in two boxes and one person placed a one in only a single box. One person chose not to respond to the question. Similarly, four people completing the mail questionnaire on STX filled out their three reasons with only ones and seven people placed a one in only a single box. One person filled out only their first and second reasons for recreationally fishing. It was unclear if the respondents who filled out the form with three ones did so because they misunderstood the directions or because their three main reasons for fishing were all equally important or if the individuals who placed a one a single box or a one in two boxes did so because there were only one or two equally important reasons the person fished. One of the disadvantages with mail surveys is that an interviewer is not available to clarify any questions that the respondent may not understand. On the other hand, the telephone survey has a disadvantage in that the respondent would more often provide responses perceived to be more favorable to the interviewer.

Obtaining food (STT/STJ – 75%, STX – 72%) and having fun and relaxing (STT/STJ - 68%, STX – 59%) were the most important reasons people fished on both STT/STJ and STX (Tables 11 & 12). Fishing for sport was the third most important reason people fished in the Virgin Islands (44%). One respondent on STT/STJ, who owned a charter sailing vessel, indicated that making money was a secondary reason for recreational fishing. Presumably guests on board his vessel recreationally fish (Table 11). On STX, two commercial fishers who recreationally fish indicated that making money was of primary importance when recreationally fishing (Table 12). Note that it is illegal in the U.S. Virgin Islands to make money by selling recreationally caught fish. However, commercial fishers may take their families or friends recreationally fishing and end up selling some of the fish caught.

Catch and release fishing was not addressed in this survey because it has not been observed to be commonly practiced by recreational boat owners (Kojis and Tobias, pers. obs.). Only two people in STT/STJ reported catch and release fishing. However, in future surveys and the long term it might be important to track the frequency that catch and release fishing is conducted in the US Virgin Islands.

Table 11. *Question 6:* The main reasons for recreational fishing given by St. Thomas/St. John District recreational fishers who owned boats in 2013.

Reasons for Recreationally Fishing	Number of Fishers – St. Thomas/St. John District											
	Phone Survey					Mail Survey					Total	
	Primary	Secondary	Tertiary	Total	Percent	Primary	Secondary	Tertiary	Total	Percent	Sum for each reason	Total percent
Sport	6	3	4	13	41%	10	3	2	15	48%	28	44%
Food	9	10	7	26	81%	12	6	3	21	68%	47	75%
Be Outdoors	1	0	3	4	13%	7	1	6	14	45%	18	29%
Have fun or relax	7	8	6	21	66%	10	6	6	22	71%	43	68%
Teach kids about fishing	2	3	6	11	34%	1	3	1	5	16%	16	25%
Spend time with friends and family	7	7	5	19	59%	5	4	3	12	39%	31	49%
Make money[1]	0	1	0	1	3%	0	0	0	0	0%	1	2%
Other	0	0	0	0	0%	0	0	1[2]	1	3%	1	2%
Total # respondents				32					31[3]		63	

[1] This respondent owned a charter sailing vessel.

[2] Other reason given for recreationally fishing was "kill lionfish."

[3] One STT/STJ fisher did not respond to the question.

Table 12. *Question 6:* The main reasons for recreational fishing given by St. Croix District recreational fishers who owned boats in 2013.

Reasons for Recreationally Fishing	Number of Fishers – St. Croix District											
	Phone Survey					Mail Survey					Total	
	Primary	Secondary	Tertiary	Total	Percent	Primary	Secondary	Tertiary	Total	Percent	Sum of boat users for each type of boat	% Using each type of Boat
Sport	1	14	7	22	44%	8	2	3	13	45%	35	44%
Food	17	12	10	39	78%	12	2	4	18	62%	57	72%
Be Outdoors	3	7	7	17	34%	1	1	3	5	17%	22	28%
Have fun or relax	16	9	6	31	62%	10	3	3	16	55%	47	59%
Teach kids about fishing	5	3	3	11	22%	1	4	1	6	21%	17	22%
Spend time with friends and family	5	4	14	23	46%	2	6	3	11	38%	34	43%
Make money	2[1]	0	0	2	4%	1	0	0	1	3%	3	4%
Other	1[2]	0	1	2	4%	2[3]	0	0	2	7%	4	5%
Total				50					29[4]		79	

[1] One commercial/subsistence fisher and one commercial/subsistence/recreational fisher reported that making money was their primary reason for recreationally fishing.
[2] Other reasons: Kill lionfish, bragging rights
[3] Other reasons: Part of sailing is to "drag a line behind the boat" and "only fish commercially".
[4] Two STX fishers did not respond to the question.

Question 7 – Percentage of Household's Food Derived from Recreational Fishing

Fishers were asked what percentage of their household's food came from recreational fishing. Fishers reported obtaining an average of 8.9% of their household's food from recreational fishing (Table 13). STX reported a slightly higher percent of household food from recreational fishing (10.4%) than STT/STJ (7.3%). Presumably those who reported high percentages of food from fishing, especially 100%, were referring to the percentage of animal protein obtained from fishing by their household or the frequency they ate fish. For example, 100% could have meant that they ate fish every day. During the QA/QC process, phone interviewers were contacted to clarify this question and asked to re-contact those individuals who reported high percentages of food from fishing. More than likely this question was still misinterpreted by some respondents based on the 100% maximum provided during the subsequent re-contact. A better question might have been: "Assuming 30 days in a month, how many days does your family eat fish each month?"

Question 7: In a typical month, approximately what percentage of your household's food comes from recreational fishing or gathering other food from the sea?

Table 13. *Question 7:* Percentage of household's food comes from recreational fishing or gathering other food from the sea.

	Percentage of Household Food from Sea						
	St. Thomas/St. John			**St. Croix**			**USVI**
	Phone	**Mail**	**Total N & Mean %**	**Phone**	**Mail**	**Total N & Mean %**	**Grand Total #/Mean**
N	31[1]	25[2]	56	49[3]	21[4]	70	126
Mean	7.9%	6.7%	7.3%	14.1%	6.7%	10.4%	8.9%
SD	7.7%	10.4%	9.1%	19.5%	7.3%	13.4%	11.3%
Minimum	0%	0%	0%	0%	0%	0%	0%
Maximum	26%	40%	33%	100%	25%	62.5%	47.8%
Median	5%	1%	3%	5%	5%	5%	4%
Mode	1%	1%	1%	5%	5%	5%	3%

[1] 31 people provided a percentage and 1 said they didn't know.
[2] 25 people provided a percentage and 3 said they didn't know.
[3] 49 people provided a percentage and 1 said they didn't know.
[4] 21 people provided a percentage and 5 said they didn't know.

Question 8 – Boats Used in Recreational Fishing

Questions 8 a-i (a multi-part question) requested information about the type, size, and ownership of boats used ***most often, 2nd most often and 3rd most*** often for recreational fishing (Appx. VIII - X). Below are the questions asked for "most often":

Question 8a: What type of boat do you use <u>most often</u> for recreational, subsistence or charter fishing?

1 ☐ Power boat 2 ☐ Sail boat 3 ☐ Row boat 4 ☐ Jet ski 5 ☐ Kayak

See Question 8 (Appendices I – IV) for definitions of the types of boats.

Question 8b. What is the length of the boat <u>most often</u> used for recreational, subsistence or charter fishing?

Question 8c. Who is the owner of the boat most often used?

1 ☐ Own boat 2 ☐ Friend's boat 3 ☐ Rental 4 ☐ Charter

The same questions were repeated for the 2nd and 3rd most commonly used boat (Appx. VIII – X). If the respondent only used one or two boats, the interviewer or respondent in the mail survey was instructed to go to Question 9, the next question.

The primary type of boat used for recreational fishing in the USVI was a power boat, used by 81% of recreational fishers. Sail boats were a distant second, used by only 16% of fishers (Tables 14 & 15). No boat owner on STT/STJ surveyed used a jet ski or kayak for fishing (Table 14). On STX, one boat owner reported using a jet ski and two boat owners reported using kayaks to recreationally fish (Table 15).

An analysis of the mean length of boats used for recreational fishing is provided in Tables 16 – 22. The mean length of power boats used for recreational fishing in the USVI was 21.4 ft, ranging in length from 12 – 50 ft (Table 22). The mean length of power boats was slightly larger on STT/STJ (22.2 ft; SD = 8.09 ft) than on STX (20.5 ft; SD = 7.64 ft). Sail boats were generally larger with a mean size of 39.7 ft. (Table 22). Also, the mean size of sailboats was larger on STT/STJ (44.6 ft; SD = 12.98 ft) (Table 18) than STX (34.4 ft; SD = 11.22 ft) (Table 21).

Recreational fishers most often used their own boats to recreationally fish (Tables 23 - 25) (Most Often category: STT/STJ – 97% of time, STX – 95%). They selected 'Most Often' much less frequently when they used a friend's boat (STT/STJ – 3%, STX – 4%). The percentage using a friend's boat increased to 41% in STT/STJ and 24% in STX in the '2nd Most Often' boat category and further increased in the '3rd Most Often' category to 56% in STT/STJ. Note that the number of respondents dropped precipitously from the '1st Most Often' to the '3rd Most Often' category (USVI – 'Most Often' – 137, '2nd Most Often' - 50, and '3rd Most Often' - 14), indicating that most people simply used their own boat.

Table 14. *Question 8a:* The primary (1st), secondary (2nd) and tertiary (3rd) most common type of boat used for recreational, subsistence or charter fishing in St. Thomas/St. John District.

Boat Type	Frequency of Use of Boat Type Primarily Used on St. Thomas/St. John											
	Phone					Mail					Total	
	1st	2nd	3rd	Total N	Percent	1st	2nd	3rd	Total N	Percent	N	Percent
Power	25	17	3	45	85%	21	8	4	33	77%	78	81%
Sail	6	1	0	7	13%	7	2	0	9	21%	16	17%
Row	1	0	0	1	2%	0	0	1	1	2%	2	2%
Jet Ski	0	0	0	0	0%	0	0	0	0	0%	0	0%
Kayak	0	0	0	0	0%	0	0	0	0	0%	0	0%
Total # responses[1]	32	18	3	53	100%	28	10	5	43	100%	96	100%

[1] Total # responses reflects the number of fishers that responded to the question.

Table 15. *Question 8a:* The primary (1st), secondary (2nd) and tertiary (3rd) most common type of boat used for recreational, subsistence or charter fishing in St. Croix District.

Boat Type	Frequency of Use of Boat Type Primarily Used on St. Croix											
	Phone					Mail					Total	
	1st	2nd	3rd	Total N	Percent	1st	2nd	3rd	Total N	Percent	N	Percent
Power	42	13	3	58	84%	20	5	1	26	76%	84	81%
Sail	7	0	1	8	12%	6	1	0	7	21%	15	15%
Row	0	0	0	0	0%	1	0	0	1	3%	1	1%
Jet Ski	1	0	0	1	1%	0	0	0	0	0%	1	1%
Kayak	0	2	0	2	3%	0	0	0	0	0%	2	2%
Total # responses[1]	50	15	4	69	100%	27	6	1	34	100%	103	100%

[1] Total # responses reflects the number of fishers that responded to the question.

Table 16. *Question 8b:* Phone Survey - The length of the boats most often, 2nd most often and 3rd most often used on St. Thomas/St. John District by boat owners who recreationally fish.

Boat Type	Length of Boats Used in Recreational Fishing on St. Thomas/St. John District															
	Phone Survey															Total Mean (ft)
	1st Most Often					2nd Most Often					3rd Most Often					
	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	
Power	25	**22.2**	6.59	12	47	17	**23.4**	9.92	12	50	3	**25.3**	12.85	16	40	22.8
Sail	6	**43.2**	4.87	36	48	1	**40.0**				0					42.7
Row	1	**10.0**				0					0					10.0
Jet Ski	0					0					0					0
Kayak	0					0					0					0
All	32	**25.9**	10.61	10	48	18	**24.3**	10.39	12	50	3	**25.3**	12.85	16	40	

Table 17. *Question 8b:* Mail Survey - The length of the boats most often, 2nd most often and 3rd most often used in St. Thomas/St. John District by boat owners who recreationally fish.

Boat Type	Length of Boats Used in Recreational Fishing on St. Thomas/St. John District															
	Mail Surveys															Total Mean (ft)
	1st Most Often					2nd Most Often					3rd Most often					
	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	
Power	21	**23.2**	7.88	12	40	7	**20.8**	9.65	12	41	4	**16.5**	4.79	11	21	21.9
Sail	6	**49.8**	17.85	33	84	2	**33.0**	5.65	29	37						45.6
Row	0					0					1	**8.0**		8	8	8.0
Jet Ski	0					0					0					0
Kayak	0					0					0					0
All	28[1]	**29.2**	15.07	12	84	9	**23.3**	10.28	12	41	5	**14.8**	5.63	8	21	

[1] For one boat, the length was provided but not the type.

Table 18. The mean length of the boats most often, 2nd most often and 3rd most often used in St. Thomas/St. John District and the total mean length of boats for boat owners who recreationally fish. Combines telephone and mail survey data.

Boat Type	Length of Boats Used in Recreational Fishing on St. Thomas/St. John District																	
	1st Most Often					2nd Most Often					3rd Most often					Combined		
	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Total Mean	SD (ft)
Power	46	**22.7**	7.15	12	47	24	**22.7**	9.70	12	50	7	**20.4**	9.43	11	40	80	**22.2**	8.09
Sail	12	**46.5**	12.96	33	84	2	**38.5**		37	40	0					14	**44.6**	12.98
Row	1	**10.0**				0					1	**8.0**				2	**9**	
Jet Ski	0					0					0					0		
Kayak	0					0					0					0		

Table 19. *Question 8b:* Phone Survey – The mean length of boats most often used, 2nd most often used, and 3rd most often used in St. Croix District by boat owners who recreationally fish.

Boat Type	Length of Boats Used in Recreational Fishing on St. Croix District															
	Phone Survey															Total Mean (ft)
	1st Most Often					2nd Most Often					3rd Most Often					
	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	
Power	42	**20.0**	4.63	12	30	13	**17.3**	7.90	9	37	3	**16.0**	8.71	10	26	19.2
Sail	7	**35.2**	5.52	30	42	0					1	**19.0**				33.2
Row	0					0					0					0
Jet Ski	1	**11.0**														11.0
Kayak	0					2	**14.0**	0	14	14	0					14.0
All	50	**21.9**	7.26	11	42	15	**16.8**	7.41	9	37	4	**16.7**	7.27	10	26	

Table 20. *Question 8b:* Mail Survey – The mean length of the boats most often used, 2nd most often used, and 3rd most often used in St. Croix District by boat owners who recreationally fish.

Boat Type	Length of Boats Used in Recreational Fishing on St. Croix District															
	Mail Survey															Total Mean (ft)
	1st Most Often					2nd Most Often					3rd Most Often					
	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	
Power	20	**23.4**	10.49	12	49	5	**26.0**	9.03	20	42	1	**9.0**				23.3
Sail	6	**37.0**	15.85	15	60	1	**28.0**				0					35.7
Row	1	**NL1**				0					0					0
Jet	0					0					0					0
Kayak	0					0					0					0
All	26	**26.5**	12.97	12	60	6	**26.3**	8.12	20	42	1	**9.0**				

[1] No length provided.

Table 21. The mean length of the boats most often, 2nd most often and 3rd most often used in St. Croix District and the total mean length of boats for boat owners who recreationally fish. Combines telephone and mail survey data.

Boat Type	Length of Boats Used in Recreational Fishing on St. Croix District																	
	1st Most Often					2nd Most Often					3rd Most often					Combined		
	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Total Mean	SD (ft)
Power	62	**21.1**	7.15	12	49	18	**19.7**	8.91	9	42	4	**14.3**	7.93	9	26	84	**20.5**	7.64
Sail	13	**36.1**	10.99	15	60	1	**28**				1	**19**				15	**34.4**	11.22
Row	0					0					0					0		
Jet Ski	1	**11**														1	**11**	
Kayak	0					2	**14**		14	14	0					2	**14**	

Table 22. The mean length of the boats most often, 2nd most often, 3rd most often used in the US Virgin Islands and the total mean length of boats by type for boat owners who recreationally fish. Combines telephone and mail survey data for both districts.

Boat Type	Length of Boats Used in Recreational Fishing in the USVI																	
	1st Most Often					2nd Most Often					3rd Most often					Combined		
	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Mean (ft)	SD (ft)	Min (ft)	Max (ft)	N	Total Mean	SD (ft)
Power	108	**21.8**	7.16	12	49	50	**21.4**	9.38	9	50	11	**18.1**	9.03	9	40	161	**21.4**	7.92
Sail	25	**41.1**	12.87	15	84	3	**35**	6.24	28	40	1	**19**				29	**39.7**	12.81
Row	1	**10.0**				0					1	**8.0**				2	**9.0**	
Jet Ski	1	**11.0**				0					0					1	**11**	
Kayak	0					2	**14**		14	14	0					2	**14**	

Table 23. *Question 8c:* Ownership of boat ***most often used*** in recreational fishing in the U.S. Virgin Islands.

Boat Owner	St. Thomas/St. John						St. Croix						U.S. Virgin Islands	
	Phone		Mail		Total N	Total %	Phone		Mail		Total N	Total %	N	%
	N	%	N	%			N	%	N	%				
Own Boat	31	97%	29	97%	60	97%	47	96%	25	93%	72	95%	132	95%
Friend's Boat	1	3%	1	3%	2	3%	1	2%	2	7%	3	4%	5	4%
Rental Boat	0	0%	0	0%	0	0%	1	2%	0	0%	1	1%	1	1%
Charter Boat	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Total	32	100%	30	100%	62	100%	49	100%	27	100%	76	100%	137	100%

Table 24. *Question 8d:* Ownership of boat ***2nd most often used*** in recreational fishing in the U.S. Virgin Islands.

Boat Owner	St. Thomas/St. John						St. Croix						U.S. Virgin Islands	
	Phone		Mail		Total N	Total %	Phone		Mail		Total N	Total %	N	%
	N	%	N	%			N	%	N	%				
Own Boat	11	61%	6	55%	17	59%	14	93%	2	33%	16	76%	33	66%
Friend's Boat	7	39%	5	45%	12	41%	1	7%	4	67%	5	24%	17	34%
Rental Boat	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Charter Boat	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Total	18	100%	11	100%	29	100%	15	100%	6	100%	21	100%	50	100%

Table 25. *Question 8e:* Ownership of boat ***3rd most often used*** in recreational fishing in the U.S. Virgin Islands.

Boat Owner	St. Thomas/St. John						St. Croix						U.S. Virgin Islands	
	Phone		Mail		Total N	Total %	Phone		Mail		Total N	Total %	N	%
	N	%	N	%			N	%	N	%				
Own Boat	2	50%	2	33%	4	44%	4	100%	1	100%	5	100%	9	64%
Friend's Boat	1	50%	4	67%	5	56%	0	0%	0	0%	0	0%	5	36%
Rental Boat	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Charter Boat	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Total	3	100%	6	100%	9	100%	4	100%	1	100%	5	100%	14	100%

Question 9 – Distance Fished from Shore (< 3 mi and/or > 3 mi)

Recreational fishers were asked if they fished <3 miles from shore (approximating the waters under territorial jurisdiction), >3 miles from shore (approximating the waters under federal jurisdiction) or in both areas. The actual legal distances are in nautical miles. However, because fishers are more familiar with miles and usually only estimate how far from shore they fish, we used miles instead of nautical miles (nm). The difference is minor since one nautical mile equals 1.151 statute miles.

If a respondent fished in waters under both territorial and federal jurisdiction, they were asked to estimate the percentage of time they fished in each jurisdiction.

Question 9. Where did you recreationally fish from the boats you own? Did you fish less than 3 miles from shore, more than 3 miles from shore or both during the 12-month period starting January 1, 2013 and ending December 31, 2013?

Recreational fishers from STX were more likely to fish solely in territorial waters (<3 miles from shore) in St. Croix (54%) than fishers on STT/STJ (33%) (Table 26). St. Croix's shelf is narrow, dropping to depths of > 1,000 m on most of the northern, southern and western side of the island. The shelf around STX only extends into federal waters on the east side of the island on Lang Bank. Only 16% of fishers (20% on STT/STJ and 12% on STX) solely fished in federal waters (> 3 miles from shore). However, when the number of respondents who fished both > and < 3 miles were added to < 3 miles and > 3 miles, then the percentage fishing in each jurisdiction is significantly higher with 85% of fishers in the USVI fishing < 3 miles from shore and 56% fishing > 3 miles from shore (Table 27).

Table 26. *Question 9:* The number and percentage of boat owners who recreationally fish in the U. S. Virgin Islands (USVI) fished <3 miles from shore (territorial jurisdiction), >3 miles (federal jurisdiction) from shore or both.

Distance from shore	St. Thomas/St. John District						St. Croix District						USVI	
	Phone		Mail		Total		Phone		Mail		Total		Grand Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<3 mi	14	44%	7	22%	21	33%	28	56%	15	50%	43	54%	64	44%
>3 mi	5	16%	8	25%	13	20%	5	10%	5	17%	10	12%	23	16%
<>3 mi	13	40%	17	53%	30	47%	17	34%	10	33%	27	34%	57	40%
Total	32	100%	32	100%	64	100%	50	100%	30[1]	100%	80	100%	144	100%

[1] One STX fisher did not respond to the question.

Table 27. *Question 9:* The total number and percent of boat owners who recreationally fish < 3 mi or > 3 mi in the USVI. The total for each category includes the number of respondents that fished only < or > 3 mi plus those that said fished both < and > 3 miles.

Distance from shore	STT/STJ						STX						USVI	
	Phone		Mail		Total		Phone		Mail		Total		Grand Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<3 mi	27	84%	24	75%	51	80%	45	90%	25	83%	70	88%	121	85%
>3 mi	18	56%	25	78%	43	67%	22	44%	15	50%	37	46%	80	56%
Total # of respon-dents[1]	32	141%	32	153%	64	147%	50	134%	30[2]	133%	80	134%	144	141%

[1] Percentage is > 100% in this row because the number of respondents fishing < and > than 3 miles was added to the number who fished < 3 miles and the number who fished > 3 miles.

[2] One STX fisher did not respond to the question.

Question 9a. If fished less and more than 3 miles from shore, please tell us what percent of the total time that you engage in fishing from your boat that you spend fishing less than and more than 3 miles from shore?

Recreational fishers who owned boats in STT/STJ and fished in both territorial and federal waters (47% of fishers) (Table 26), fished more in territorial waters (57%, SD = 21.4) than federal waters (43%, SD = 21.4) (Table 28). In contrast, the 34% of fishers who fished in both jurisdictions on STX (Table 26), spent more time fishing in federal waters (57%, SD = 24.05) than territorial waters (43%, SD = 24.05) (Table 29). The mean percent of time all respondents fished <3 miles in the USVI is 50.6% (SD = 23.5) and 49.4% (SD = 23.5) for >3 miles.

Table 28. *Question 9a:* Percentage of time recreational boat owners in St. Thomas/St. John District who were recreationally fishing spent fishing less than (<) and more than (>) 3 miles from shore.

Distance from shore	STT/STJ													
	Phone						Mail						Total	
	N	Mean %	SD	Min	Max	Mode	N	Mean %	SD	Min	Max	Mode	N	Mean %
<3 mi	13	**53%**	24	10%	95%	50%	16	**60%**	19.7	10%	90%	50%	29	**57%**
>3 mi	13	**47%**	24	10%	90%	50%	16	**40%**	19.7	10%	90%	50%	29	**43%**
Total # respondents	13	**100%**					16	**100%**					29	**100%**

Table 29. *Question 9a:* Percentage of time recreational boat owners in St. Croix District who were recreationally fishing spent fishing less than (<) or more than (>) 3 miles from shore.

Distance from Shore	STX													
	Phone						Mail						Total	
	N	Mean %	SD	Min	Max	Mode	N	Mean %	SD	Min	Max	Mode	N	Mean %
<3 mi	17	**48%**	24.9%	10%	90%	50%	9	**34%**	20.6	10%	70%	40%	26	**43%**
>3 mi	17	**52%**	24.9%	10%	90%	50%	9	**66%**	20.6	30%	90%	60%	26	**57%**
Total # respond-ents	17	**100%**					9	**100%**					26	**100%**

Question 10 – Fish Landing Sites

Recreational boat owners were asked where they landed their fish when they returned to shore. This was an important question to determine which sites to initially target when port sampling recreational fishers. The question listed government boat ramps in each district and then asked if they used a private boat ramp or unimproved access area, a public or private marina, a public or private dock, a private residence, or other. If they used other than a government boat ramp, they were asked to provide the location of the landing site.

The responses to Question 10 were sometimes difficult to interpret because some government boat ramps, depending on site location, were also constructed with docks to facilitate launching and retrieval of boats; others were not. STT/STJ government ramps do not have docks; whereas, Frederiksted and Altona Lagoon facilities in STX have docks. To further complicate matters, the Molasses Dock on STX consists of an old concrete bulkhead for offloading commercial cargo and two adjacent government ramps. The concrete bulkhead, because of its distance from the boat ramps and height above water may or may not be used in the launching and retrieval of recreational vessels. Recreational boat owners using public or private marinas keep their boats in slips along docks. To avoid redundancy, it was assumed that if a dock was present at a government ramp, the dock was used during the launching and retrieval of the vessel. Use of a public or private dock was recorded only if the dock was not associated with a government boat ramp, marina or if the recreational boater indicated specifically that they only used a dock rather than a boat ramp at a government facility. Also for analysis purposes, marinas and yacht clubs were considered as belonging to the same category.

Question 10. **Where do you most often land your fish when you return to shore with your boat? See Appx VIII - X for details.**

Government improved boat ramps were the most commonly used facilities for landing fish (Table 30). Fishers in STX used government improved public boat ramps much more frequently than in STT/STJ (Table 30). On STX 70% of recreational fishers used government boat ramps vs. 50% on STT/STJ. Marinas were the second most common type of facility used for landing

fish with 21% of fishers in the USVI reporting using marinas. Marinas were more often used by STT/STJ recreational fishers (25%) than STX fishers (17%).

The locations of boat ramps, marinas, docks, etc. used by recreational fishers are provided in Tables 31 – 39. The boat ramps most commonly used by recreational fishers on St. Croix District were the Altona Lagoon and Frederiksted ramps (Table 31). No recreational fishers indicated that they used the Cane Bay ramp. This ramp is located on the northwest coast, distant from populated areas, subject to wave action and lies within a designated non-motorized recreational watersports activity area. The Mangrove Lagoon, Hull Bay and Krum Bay ramps were the ones most commonly used in STT/STJ (Table 31). Fishers on STX often used more than one government improved boat ramp, while in STT/STJ no fisher indicated using more than one ramp.

Table 30. *Questions 10a,b,c:* Frequency of use of general types of fish landing sites by recreational fishers in the U.S. Virgin Islands. These include government improved boat ramps (Gov't ramps), private boat ramps or unimproved access areas (Other ramps), public or private marinas (Marinas), public or private docks (Docks), private residence (Residence) and/or other.

Fish landing sites	Use of different types of Fish Landing Sites													
	St. Thomas/St. John						St. Croix						U.S. Virgin Islands	
	Phone		Mail		Total N	Total %	Phone		Mail		Total N	Total %		
	N	%	N[1]	%			N	%	N	%			N	%
Gov't ramps	14	45%	16	55%	30	50%	36	72%	22	71%	58	72%	88	62%
Other ramps	6	19%	2	7%	8	13%	5	10%	3	10%	8	10%	16	11%
Marinas	5	16%	10	34%	15	25%	6	12%	8	26%	14	17%	29	21%
Docks	5	16%	5	17%	10	17%	3	6%	0	0	3	4%	13	9%
Residence	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Other	4	13%	3	10%	7	12%	7	14%	2	6%	9	11%	16	11%
Total # respondents	31	109%	29	124%	60	117%	50	114%	31	113%	81	114%	141	115%

[1] Three recreational fishers did not respond to Question 10.

Table 31. *Question 10a,b,c:* Frequency of use of government improved public boat ramps to land fish by recreational fishers who use boat ramps by in the U.S. Virgin Islands. STT = St. Thomas and STJ = St. John.

Gov't Improved Public Boat Ramps	Use of Government Improved Public Boat Ramps											
	St. Thomas/St. John District						St. Croix District[1]					
	Phone		Mail		Total N	Total %	Phone		Mail		Total N	Total %
	N	%	N	%			N	%	N	%		
St. Croix												
Altona Lagoon							20	56%	12	55%	32	55%
Frederiksted							15	42%	10	45%	25	43%
Molasses Dock							20	56%	5	23%	25	43%
Cane Bay							0	0%	0	0%	0	0%
Total # Respondents							36	153%	22	123%	58	141%
St. Thomas/St. John[2]												
Krum Bay – STT	1	7%	5	31%	6	21%						
Mangrove Lagoon – STT	6	43%	3	19%	9	31%						
Hull Bay - STT	3	21%	5	31%	8	28%						
Frenchtown – STT	1	7%	2	13%	3	10%						
Sea Plane (NPS) – STJ	1	7%	1	6%	2	7%						
Coral Bay - STJ	2	14%	0	0%	2	3%						
Total # Respondents	13	100%	16	100%	29	100%						

[1] Some respondents used more than one boat ramp.
[2] None of the respondents on St. Thomas/St. John indicated using more than one ramp.

Public boat ramps are built and/or maintained by the Department of Planning and Natural Resources, Division of Fish and Wildlife (DPNR/DFW) through federal funding provided by U.S. Fish and Wildlife, Sport Fish Restoration Grants. Any fisherman can use the boat ramps. Over the years, there has been some concern that the ramps are not being used by recreational fishers. However, in this study, 72% of recreational fishers use these ramps on STX and 50% on STT/STJ (Table 30). Note that we did not ask about frequency of use of the boat ramp facilities. It is likely that STX fishers use the ramps regularly while STT/STJ fishers may use the ramps only periodically, e.g. when a storm is imminent or their boat needs maintenance.

The use of boat ramps in the USVI is a function of terrain, coastal features and fetch of adjacent open waters. STX has large expanses of relatively flat land and many power boat owners trailer their boats, storing them at their homes. STT/STJ are mountainous and boat ramps are more often used to take boats out of the water for repair, to store during hurricane season or when people are away, and when storms are imminent. The coastline of STT/STJ is more irregular that STX affording numerous protected bays for mooring boats. STT, STJ and adjacent cays (the

northern USVI) lie on the Puerto Rico Bank along with the BVI. The proximity to the British Virgin Islands (BVI) and numerous small cays affords further protection from seas, prevailing winds and storm conditions. In contrast, STX is an oceanic island located 40 miles south of the northern USVI and BVI. Recreational boaters on STX are exposed to open ocean conditions immediately offshore. Buck Island is the only other land mass nearby.

Table 32. *Question 10d:* Location, type and percentage of respondents using private or unimproved boat access areas to land fish in St. Thomas/St. John District.

Private or unimproved boat ramps	Type	Phone		Mail		Total N	Total %
		N	%	N	%		
Coral World Ramp – STT	Improved – private business	1	25%			1	17%
Cruz Bay Creek – STJ	Improved – US Gov't (NPS)	1	25%			1	17%
Lovango Cay	Improved – private subdivision			1	50%	1	17%
Magen's Bay Beach – STT	Unimproved – public	2	50%	1	50%	3	50%
Total		4	100%	2	100%	6	100%

Table 33. *Question 10d:* Location, type and percentage of respondents using private boat ramp or unimproved boat access areas to land fish in St. Croix District.

Private or unimproved boat ramps	Type	Phone		Mail		Total N	Total %
		N	%	N	%		
Castle Nugent	Unimproved	2	40%			2	25%
Estate Carlton	Unimproved	1	20%			1	13%
St. Croix Yacht Club	Private/unimproved			3	100%	3	38%
Salt River	Unimproved	2	40%			2	25%
Total		5	100%	3	100%	8	100%

Table 34. *Question 10e:* Location, type and percentage of respondents using public or private marinas to land fish in St. Thomas/St. John District.

Public or Private Marinas	Type	Phone		Mail		Total N	Total %
		N	%	N	%		
American Yacht Harbor – STT				6	60%	6	40%
Compass Point Marina – STT	Private	2	40%	2	20%	4	27%
Coral Bay Marina – STJ	Private	1	20%			1	7%
Crown Bay Marina – STT	Private	2	40%			2	13%
St. Thomas Yacht Club – STT	Private	1	20%	1	10%	2	13%
WICO – STT[1]	Public			1	10%	1	7%
Yacht Haven Grande Marina - STT	Private	1	20%			1	7%
Total # respondents[2]		5	140%	10	100%	15	113%

[1] WICO (West Indies Corporation) is owned by the VI Government through the Government Employees Retirement Association.
[2] Two respondents each provided two marinas where they kept their boats.

Table 35. *Question 10e:* Location, type and percentage of respondents using public or private marina to land fish in St. Croix District.

Public or Private Marinas	Phone			Mail		Total N	Total %
	Type	N	%	N	%		
Green Cay Marina	Private	1	17%	3	38%	4	29%
St. Croix Marine	Private	1	17%	3	38%	4	29%
St. Croix Yacht Club	Private	1	17%	1	13%	2	14%
St. Thomas Yacht Club	Private	1	17%			1	7%
Salt River Marina	Private	2	33%			2	14%
Silver Bay Marina	Private			1	13%	1	7%
Total		6	100%	8	100%	14	100%

Table 36. *Question 10f:* Location, type and percentage of respondents using public or private docks to land fish in St. Thomas/St. John District. Not included are docks at government improved public boat facilities.

Public or Private Docks	Phone			Mail		Total N	Total %
	Type	N	%	N	%		
Benner Bay Dock – STT	Private	1	20%			1	10%
Carib Beach Hotel – STT	Private			1	20%	1	10%
Coki Point – STT	Private			1	20%	1	10%
Coral Bay Dock – STT	Private	1	20%			1	10%
Cruz Bay Dock – STJ	Public	1	20%			1	10%
Flamingo Bay, Water Island – STT	Public			2	40%	2	20%
Frenchtown Dock – STT	Public	1	20%			1	10%
Lovango Cay – STT	Private			1	20%	1	10%
Water Taxi Dock – Vessup Bay – STT	Private	1	20%			1	10%
Total		5	100%	5	100%	10	100%

Table 37. *Question 10f:* Location, type and percentage of respondents using public or private docks to land fish by recreational fishers in St. Croix District. Not included are docks at government improved public boat facilities.

Public or Private Docks	Phone			Mail			Total N	Total %
	Type	N	%	Type	N	%		
Gallows Bay	Public	2	67%	N/A	0	0%	2	67%
King's Alley Dock	Private	1	33%	N/A	0	0%	1	33%
Total		3	100%	N/A	0	0%	3	100%

Table 38. *Question 10h:* Location, type and percentage of respondents using "Other" landing facilities to land fish in St. Thomas/St. John District.

Other Fish Landing Facilities	Phone			Mail		Total N	Total %
	Type of boat	N	%	N	%		
Catch and Release Only – no landing of fish	Sail/Power	1	17%	1	33%	1	13%
Cruz Bay Mooring – STJ	Sail	1	17%			1	13%
Elephant Bay – Water Island – STT	Power	1	17%			1	13%
Johnson's Bay – STJ	Power	1	17%			1	13%
Mandal Bay Salt Pond – STT	Power	1	17%	1	33%	2	25%
Mooring (LOB[1]) – STJ	Sail			1	33%	1	13%
Water Bay Beach – STT	Power	1	17%			1	13%
Total		6	102%	3	100%	8	103%

[1] LOB = Live on Board

Six recreational fishers on STX reported landing their fish at their mooring. All but one of these fishers owned sailboats (Table 39).

Table 39. *Question 10g:* Location, type and use of "other" fish landing facilities by recreational fishers in St. Croix District.

Other Fish Landing Facilities	Phone			Mail		Total N	Total %
	Type of boat	N	%	N	%		
Christiansted Harbor Mooring	Sail	4	57%	1	50%	5	56%
Rainbow Beach[1]	Jet Ski	1	14%			1	11%
St. Croix Yacht Club Mooring	Sail	1	14%			1	11%
Salt River Marina Mooring	Sail	1	14%			1	11%
Teague Bay Mooring	Sail			1	50%	1	11%
Total		7	100%	2	100%	9	100%

[1] Recreational boat-based fisher using jet ski lands fish at beach launch site.

Question 11 – Time of Day Fish Are Landed

This question asked what time of day boat-based recreational fishers landed their fish. Possible times were broken into three hour intervals starting with midnight and fishers were asked what time period they most frequently, 2nd most frequently, and third most frequently landed their fish.

Question 11. We are interested in what time of day you usually land your fish. We have divided the day into three-hour time periods starting with midnight to 3 am, 3 am to 6 am, etc. What are your most frequent, 2nd most frequent and 3rd most frequent times that you RETURN to shore from fishing?

The most common time of day that boat-based recreational fishers on STT/STJ landed fish was 9 am to 9 pm with a peak landing period from 3 – 6pm, when 38% of fishers landed fish (Table 40). The percentage of fishers landing fish at the peak time was over twice that of any other time. No fishers said that they landed fish between midnight and 3 am and very few from 3 - 6 am and 9 pm to 12 midnight.

In STX, the most common time for landing fish was the same, 9 am – 9 pm, with a peak landing time of 3 – 6 pm, followed closely by 12 noon – 3 pm (Table 41). The overall peak percentage on STX was only 24% compared with 38% on STT/STJ. While the number/percent of STX fishers landing fish between 9 pm to 9 am was considerably lower than 9 am – 9 pm, some STX fishers landed fish during every time period.

Table 40. *Question 11:* The time of day (3-hr intervals) that recreational fishers on STT/STJ most frequently (1st), 2nd most frequently (2nd), and 3rd most frequently (3rd) return to shore from fishing.

Return Time	Time period recreational fishers on STT/STJ usually land fish																	
	Phone								Mail								Grand Total	
	1st		2nd		3rd		Total N	Total %	1st		2nd		3rd		Total N	Total %		
	N	%	N	%	N	%			N	%	N	%	N	%			N	%
12 – 3 am	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
3 – 6 am	2	6%	0	0%	0	0%	2	3%	0	0%	0	0%	0	0%	0	0%	2	2%
6 – 9 am	2	6%	2	10%	0	0%	4	6%	3	10%	2	10%	1	6%	6	9%	10	8%
9 am – 12 pm	6	19%	1	5%	3	21%	10	15%	3	10%	4	19%	5	28%	12	17%	22	17%
12 – 3 pm	3	10%	4	20%	5	36%	12	19%	5	17%	4	19%	1	6%	10	15%	22	17%
3 - 6 pm	12	39%	9	45%	4	29%	25	38%	15	52%	6	29%	4	22%	25	37%	50	38%
6 – 9 pm	6	19%	3	15%	2	14%	11	17%	2	7%	5	24%	5	28%	12	17%	23	17%
9 pm – 12 am	0	0%	1	5%	0	0%	1	2%	1	3%	0	0%	2	11%	3	4%	4	3%
Total	31[1]	99%[3]	20	100%	14	100%	65	100%	29[2]	100%	21	101%[3]	18	101%	68	100%	133	102%[3]

[1] One fisher did not respond to the question.

[2] Three fishers did not respond to the question.

[3] Percentages are higher or lower than 100% because of rounding.

Table 41. *Question 11:* The time of day (3-hr intervals) that recreational fishers on STX most frequently (1st), 2nd most frequently (2nd), and 3rd most frequently (3rd) return to shore from fishing.

Return Time	Time period recreational fishers on STX usually land fish																	
	Phone								Mail								Grand[2] Total	
	1st		2nd		3rd		Total N	Total %	1st		2nd		3rd		Total N	Total %		
	N	%	N	%	N	%			N	%	N	%	N	%			N	%
12 – 3 am	0	0%	1	3%	1	6%	2	2%	1	4%	1	5%	2	14%	4	7%	6	4%
3 – 6 am	2	4%	0	0%	0	0%	2	2%	0	0%	0	0%	0	0%	0	0%	2	1%
6 – 9 am	2	4%	1	3%	1	6%	4	4%	2	7%	0	0%	1	7%	3	5%	7	4%
9 am – 12 pm	8	16%	3	9%	5	28%	16	16%	9	32%	1	5%	5	36%	15	24%	31	19%
12 – 3 pm	9	18%	9	26%	5	28%	23	22%	6	21%	8	40%	1	7%	15	24%	38	23%
3 - 6 pm	18	36%	7	20%	2	11%	27	26%	8	29%	4	20%	1	7%	13	21%	40	24%
6 – 9 pm	6	12%	11	31%	1	6%	18	17%	1	4%	5	25%	4	29%	10	16%	28	17%
9 pm – 12 am	5	10%	3	9%	3	17%	11	11%	1	4%	1	5%	0	0%	2	3%	13	8%
Total	50	100%	35	101%[1]	18	102 %[1]	103	100%	28[3]	101%[1]	20	100%	14	100%	62	100%	165	100%

[1] Percentages are higher than 100% because of rounding.

[2] Grand total includes total of most frequent, 2nd most frequent and 3rd most frequent for both phone and mail surveys.

[3] Three fishers did not respond to the question.

Question 12 – Length of Fishing Trips

This question was the first of two questions (Questions 12 and 13) regarding fisher effort.

Question 12. On average, how many hours do you fish during each trip?

The mean length of an average recreational fishing trip in the USVI was 4.2 hrs on STX and 4.7 hrs on STT/STJ for a territorial mean of 4.4 hrs (Table 42). The median and mode for hours fished per trip in the U.S. Virgin Islands was 4 hrs. The minimum number of hours fished on average was 0.5 on STX and 1.0 on STT/STJ. The maximum was longer on STT/STJ than on STX for both the phone and mail surveys.

Table 42. *Question 12:* Average number of hours recreational fishermen in the U.S. Virgin Islands estimated that they fished per trip. Median and mode were included because the data had a negative skewness and kurtosis indicating that the distribution was non-normal.

Survey	Estimated Average Number of Hours Fished per Trip						
	N	Mean	SD	Min	Max	Median	Mode
St. Thomas/St. John District							
Phone	30[1]	4.4	2.45	1	13	4	4
Mail	30[2]	5.1	4.34	1	24	4	4
Total[1]	60	4.7	3.51	1	24	4	4
St. Croix District							
Phone	50	4.3	1.88	0.5	9	4	6
Mail	29[3]	4.0	1.29	2	7	4	3
Total[1]	79	4.2	1.69	0.5	9	4	4
U.S. Virgin Islands							
Grand Total[4]	139	4.4	2.64	0.5	24	4	4

[1] Two fishers did not respond to the question.
[2] Two fishers did not respond to the question.
[3] Two fishers did not respond to the question
[4] Total is based on an analysis of the combined data from the surveys.

Question 13 – The Average Number of Fishing Trips Taken Each Month

This was the second question of two questions regarding fisher effort.

Question 13. On average, how many trips do you take to go fishing in a month?

The average # of trips fished per month was not significantly different between STT/STJ and STX (Z-Score for non-parametric one-tail Mann-Whitney U-Test (Stangroom 2015) is 1.1322, p-value = 0.12924, distribution is approximately normal so Z-value can be used). The mean number of fishing trips per month in the USVI was 3.3 with a mean of 2.7 on STT/STJ and 3.8 on STX (Table 43). There were 1.1 fewer estimated fishing trips per month on STT/STJ compared with STX.

Table 43. *Question 13:* Average number of trips recreational fishermen in the U.S. Virgin Islands estimated that they fished per month.

Survey	Estimated Average Number of Trips Fished per Trip						
	N	Mean	SD	Min	Max	Median	Mode
St. Thomas/St. John District							
Phone	30[1]	3.1	1.98	1	8	3	1
Mail	29[2]	2.4	2.48	0.001	10	1.5	1
Total	59	2.7	2.27	0.001	10	2	1
St. Croix District							
Phone	49[3]	4.4	4.75	0.08	24	3	1
Mail	25[4]	2.8	2.51	0.2	9	2	1
Total	74	3.8	4.18	0.08	24	2	1
U.S. Virgin Islands							
Grand Total[5]	133	3.3	3.50	0.001	24	2	1

[1] Two fishers did not respond to the question.
[2] Three fishers did not respond to the question.
[3] One fisher did not respond to the question.
[4] Six fishers did not respond to the question.
[5] Total is based on an analysis of the combined data from the surveys.

Question 14 – Tournament Participation

Tournaments are an important recreational fishing activity in the USVI. Question 14 asked recreational fishers if they participated in fishing tournaments in the USVI in 2013 and, if so, how many.

Question 14. Did you fish in any fishing tournaments during the 12-month period starting January 1, 2013 and ending December 31, 2013?

Five types of sportfishing tournaments are recognized in the Virgin Islands, shore-based handline, boat-based handline, offshore coastal pelagic, offshore pelagic and marlin tournaments (Toller et. al., 2005). Shore-based and boat-based handline tournaments target demersal (bottom) species such as snappers, groupers, grunts and triggerfish. Offshore coastal pelagic tournaments target barracudas, mackerel, jacks and small tunas. Offshore pelagic tournaments target dolphin, wahoo and large tunas. Marlin tournaments are specific for marlin species. It is not uncommon for a district to hold nine or more recreational fishing tournaments annually, which may include one or more inter-island tournaments.

More individuals participated in fishing tournaments from St. Thomas/St. John than in St. Croix (22% and 6%, respectively) (Table 44). Very little variation in numbers of participants was exhibited within district phone vs mail responses. Overall, 14% of the Virgin Islands respondents participated in recreational fishing tournaments.

Table 44. *Question 14:* Tournament participation rate of USVI recreational fishers in 2013.

	Tournament Participation Rate													
	St. Thomas/St. John District						St. Croix District						USVI	
	Phone		Mail		Total		Phone		Mail		Total		Grand Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
# of tournament participants	7	23%	7	22%	14	22%	3	6%	2	7%	5	6%	19	14%
Total # respondents answering question	31[1]		32		63		49[2]		29[3]		78		141	

[1] One fisher did not respond to the question.
[2] One fisher did not respond to the question.
[3] Two fishers did not respond to the question.

Question 14a. How many times do you participate in fishing tournaments during a typical year?

The percentage of USVI anglers participating in tournaments was 14% (Table 45). While the angler participation rate was higher on STT/STJ (22%) than on STX (8%), individual STX anglers who fished in tournaments participated in more tournaments annually than anglers on STT/STJ (3.3 vs 2.6, respectively). The mean number of tournaments participated in by anglers who fished in tournaments in the USVI was 2.8.

Table 45. *Question 14a:* Annual tournament participation of boat-based anglers who indicated that they participated in tournaments during 2013.

Survey	Total # respondents answering question	Frequency of tournament participation by fishers who participate in tournaments					
		N	% angler participation	Mean # of tournaments	SD	Min	Max
St. Thomas/St. John District							
Phone	31[1]	7	23%	3.3	1.38	2	6
Mail	32	7	22%	1.9	1.57	1	5
Total[1]	63	14	22%	2.6	1.60	1	6
St. Croix District							
Phone	49[2]	3	6%	3.3	1.15	2	4
Mail	29[3]	3	10%	3.2	1.04	2	4
Total[1]	78	6	8%	3.3	0.99	2	4
U.S. Virgin Islands							
Grand Total	141	20	14%	2.8[4]	1.46	1	6

[1] One fisher did not respond to the question.
[2] One fisher did not respond to the question.
[3] Two fishers did not respond to the question.
[4] Total mean and SD is based on an analysis of the combined data from the surveys.

Question 15 – Type of Fishing Undertaken

Anglers were asked what types of fishing they did, such as offshore trolling, inshore trolling, etc., and the frequency with which they used that gear. The primary types of fish caught with each method were provided to help fishers identify the type of fishing more accurately (see Appx. VIII - X).

Question 15. During the 12-month period starting January 1, 2013 and ending December 31, 2013, we would like to know the types of fishing that you did. I will read you the types of fishing and ask you to indicate the number of times in the year that you used that fishing type. The frequency choices are Never (0), Rarely (1-3), Sometimes (4-8), Often (9-12) and Very Often (>12).

Phone interviewers recorded the responses from the respondents. Mail survey respondents checked the frequency box for all fishing types that applied. Mail survey frequency boxes not checked for a type of fishing were assumed to be a "Never" response (respondent did not use that fishing type).

Tables 46 – 58 summarize the participation rate of USVI boat-based recreational fishers in 13 different types of fishing methods. The method of fishing with the highest participation rate in STT/STJ (65%) was offshore trolling for tuna, dolphin, wahoo and billfish (Table 46). The 2nd most common type of fishing (61% participation rate) in STT/STJ was inshore trolling for jacks, mackerel and barracuda (Table 47). Shallow bottom fishing for snapper, grunt and grouper was also a popular fishing method in STT/STJ (52%) (Table 49). Similarly, St. Croix fishers' highest participation rate was also in offshore trolling (55%) (Table 46), followed closely by shallow bottom fishing (54%) (Table 49) and inshore trolling (42%) (Table 47). The participation rate was lowest for deep drift line fishing at night for swordfish on STT/STJ and STX, 5% and 3% respectively (Table 58). Both STT/STJ and STX respondents reported similar values for shallow bottom fishing (52% and 54%, respectively) (Table 49), shallow drift line fishing for yellowtail snapper (30% and 32%, respectively) (Table 55), buoy fishing (11% and 13%, respectively) (Table 56) and deep drop fishing in daytime for swordfish (8% and 8%, respectively) (Table 57).

Table 46. *Question 15:* USVI recreational angler participation rate in **offshore trolling** (e.g. tuna, dolphin/wahoo/billfish) in 2013.

Type of Survey	Number of Times a Year											
	N[1] Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31[2]	13	42%	6	19%	6	19%	4	13%	2	6%	18	58%
Mail	32	9	28%	4	13%	9	28%	5	16%	5	16%	23	72%
Total	63	22	35%	10	16%	15	24%	9	14%	7	11%	41	65%
St. Croix District													
Phone	48[3]	22	46%	7	15%	7	15%	6	13%	6	13%	26	54%
Mail	30[4]	13	43%	3	10%	7	23%	2	7%	5	17%	17	57%
Total	78	35	45%	10	13%	14	18%	8	10%	11	14%	43	55%
USVI													
Total	141	57	40%	20	14%	29	21%	17	12%	18	13%	84	60%

[1] The number of respondents in the survey.
[2] One fisher did not respond to the question.
[3] Two fishers did not respond to the question.
[4] One fisher did not respond to the question.

Table 47. *Question 15:* USVI recreational angler participation rate in **inshore trolling** (e.g. jacks, mackerel, barracuda) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	30[1]	10	32%	5	16%	10	32%	3	10%	2	6%	20	65%
Mail	32	14	44%	5	16%	6	19%	5	16%	2	6%	18	56%
Total	62	24	40%	10	16%	16	26%	8	13%	4	6%	38	61%
St. Croix District													
Phone	48	25	54%	5	11%	8	17%	6	13%	4	9%	23	48%
Mail	30	20	67%	7	23%	1	3%	1	3%	1	3%	10	33%
Total	78	45	58%	12	15%	9	12%	7	9%	5	6%	33	42%
USVI													
Total	140	69	49%	22	16%	25	18%	15	11%	9	6%	71	51%

[1] One fisher did not respond to inshore trolling.

Table 48. *Question 15:* USVI recreational angler participation rate in **tuna handlining** in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	24	77%	3	10%	4	13%	0	0%	0	0%	7	23%
Mail	32	28	88%	1	3%	2	6%	0	0%	1	3%	4	13%
Total	63	52	83%	4	6%	6	10%	0	0%	1	2%	11	17%
St. Croix District													
Phone	48	43	90%	1	2%	2	4%	1	2%	1	2%	5	10%
Mail	30	29	97%	0	0%	1	3%	0	0%	0	0%	1	3%
Total	78	72	92%	1	1%	3	4%	1	1%	1	1%	6	8%
USVI													
Total	141	124	88%	5	4%	9	6%	1	1%	2	1%	17	12%

Table 49. *Question 15:* USVI recreational angler participation rate in **shallow bottom fishing** (grouper, snapper, grunt, etc.) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	7	23%	4	13%	10	32%	4	13%	6	19%	24	77%
Mail	32	23	72%	4	13%	4	13%	0	0%	1	3%	9	28%
Total	63	30	48%	8	13%	14	22%	4	6%	7	11%	33	52%
St. Croix District													
Phone	48	19	40%	3	6%	9	19%	10	21%	7	15%	29	60%
Mail	30	17	57%	6	20%	3	10%	4	13%	0	0%	13	43%
Total	78	36	46%	9	12%	12	15%	14	18%	7	9%	42	54%
USVI													
Total	141	66	47%	17	12%	26	18%	18	13%	14	10%	75	53%

Table 50. *Question 15:* USVI recreational angler participation rate in **deep bottom fishing**, also known as "banking," (e.g. grouper, snapper) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	17	55%	7	23%	3	10%	3	10%	1	3%	14	45%
Mail	32	21	66%	1	3%	9	28%	1	3%	0	0%	11	34%
Total	63	38	60%	8	13%	12	19%	4	6%	1	2%	25	40%
St. Croix District													
Phone	48	34	71%	2	4%	6	13%	6	13%	0	0%	14	29%
Mail	30	22	73%	4	13%	3	10%	1	3%	0	0%	8	27%
Total	78	56	72%	6	8%	9	12%	7	9%	0	0%	22	28%
USVI													
Total	141	94	67%	14	10%	21	15%	11	8%	1	1%	47	33%

Table 51. *Question 15:* USVI recreational angler participation rate in **spearfishing** (scuba or free diving) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	20	65%	1	3%	5	16%	3	10%	2	6%	11	35%
Mail	32	20	63%	3	9%	2	6%	1	3%	6	19%	12	38%
Total	63	40	63%	4	6%	7	11%	4	6%	8	13%	23	37%
St. Croix District													
Phone	48	35	73%	1	2%	3	6%	5	10%	4	8%	13	27%
Mail	30	23	77%	4	13%	2	7%	1	3%	0	0%	7	23%
Total	78	58	74%	5	6%	5	6%	6	8%	4	5%	20	26%
USVI													
Total	141	98	70%	9	6%	12	9%	10	7%	12	9%	43	30%

Table 52. *Question 15:* USVI recreational angler participation rate in **casting** (rod and reel) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	28[1]	11	39%	7	25%	4	14%	1	4%	5	18%	17	61%
Mail	32	20	63%	4	13%	5	16%	3	9%	0	0%	12	38%
Total	60	31	52%	11	18%	9	15%	4	7%	5	8%	29	48%
St. Croix District													
Phone	48	31	65%	6	13%	7	15%	3	6%	1	2%	17	35%
Mail	30	24	80%	2	7%	2	7%	0	0%	2	7%	6	20%
Total	78	55	71%	8	10%	9	12%	3	4%	3	4%	23	29%
USVI													
Total	138	86	62%	19	14%	18	13%	7	5%	8	6%	52	38%

[1] Three fishers did not respond to casting.

Table 53. *Question 15:* USVI recreational angler participation rate in **hand collecting** (conch, lobster, whelk, octopus) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	17	55%	5	16%	6	19%	2	6%	1	3%	14	45%
Mail	32	25	78%	3	9%	1	3%	0	0%	3	9%	7	22%
Total	63	42	67%	8	13%	7	11%	2	3%	4	6%	21	33%
St. Croix District													
Phone	48	35	73%	8	17%	3	6%	1	2%	1	2%	13	27%
Mail	30	25	83%	3	10%	2	7%	0	0%	0	0%	5	17%
Total	78	60	77%	11	14%	5	6%	1	1%	1	1%	18	23%
USVI													
Total	141	102	72%	19	13%	12	9%	3	2%	5	4%	39	28%

Table 54. *Question 15:* USVI recreational angler participation rate in **cast net fishing** (bait, other) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	13	42%	4	13%	8	26%	5	16%	1	3%	18	58%
Mail	32	24	75%	1	3%	4	13%	1	3%	2	6%	8	25%
Total	63	37	59%	5	8%	12	19%	6	10%	3	5%	26	41%
St. Croix District													
Phone	48	30	63%	3	6%	6	13%	6	13%	3	6%	18	38%
Mail	30	24	80%	2	7%	3	10%	0	0%	1	3%	6	20%
Total	78	54	69%	5	6%	9	12%	6	8%	4	5%	24	31%
USVI													
Total	141	91	65%	10	7%	21	15%	12	9%	7	5%	50	35%

Table 55. *Question 15:* USVI recreational angler participation rate in **shallow drift line fishing** (yellowtail snapper) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	18	58%	4	13%	4	13%	5	16%	0	0%	13	42%
Mail	32	26	81%	0	0%	5	16%	1	3%	0	0%	6	19%
Total	63	44	70%	4	6%	9	14%	6	10%	0	0%	19	30%
St. Croix District													
Phone	48	28	58%	7	15%	5	11%	5	11%	3	6%	20	42%
Mail	30	25	83%	2	7%	2	7%	1	3%	0	0%	5	17%
Total	78	53	68%	9	12%	7	9%	6	8%	3	4%	25	32%
USVI													
Total	141	97	69%	13	9%	16	11%	12	9%	3	2%	44	31%

Table 56. *Question 15:* USVI recreational angler participation rate in **buoy fishing** (live or dead bait fished from surface buoy) in 2013.

Type of Survey	Number of Times a Year												
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	28	90%	1	3%	1	3%	1	3%	0	0%	3	10%
Mail	32	28	88%	2	6%	1	3%	1	3%	0	0%	4	13%
Total	63	56	89%	3	5%	2	3%	2	3%	0	0%	7	11%
St. Croix District													
Phone	48	42	88%	1	2%	4	8%	1	2%	0	0%	6	13%
Mail	30	26	87%	2	7%	0	0%	2	7%	0	0%	4	13%
Total	78	68	87%	3	4%	4	5%	3	4%	0	0%	10	13%
USVI													
Total	141	124	88%	6	4%	6	4%	5	4%	0	0%	17	12%

Table 57. *Question 15:* USVI recreational angler participation rate in **deep drop fishing – daytime** fishing (swordfish) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	28	90%	1	3%	1	3%	0	0%	1	3%	3	10%
Mail	32	30	94%	1	3%	1	3%	0	0%	0	0%	2	6%
Total	63	58	92%	2	3%	2	3%	0	0%	1	2%	5	8%
St. Croix District													
Phone	48	44	92%	3	6%	1	2%	0	0%	0	0%	4	8%
Mail	30	28	93%	1	3%	1	3%	0	0%	0	0%	2	7%
Total	78	72	92%	4	5%	2	3%	0	0%	0	0%	6	8%
USVI													
Total	141	130	92%	6	4%	4	3%	0	0%	1	1%	11	8%

Table 58. *Question 15:* USVI recreational angler participation rate in **deep drift line fishing – night** (swordfish) in 2013.

Type of Survey	Number of Times a Year											
	N Respondents	Never		Rarely (1-3)		Sometimes (4-8)		Often (9-12)		Very Often (>12)		Total (excluding participants who responded "Never")	
		N	%	N	%	N	%	N	%	N	%	N	%
St. Thomas/St. John District													
Phone	31	29	94%	1	3%	1	3%	0	0%	0	0%	2	6%
Mail	32	31	97%	1	3%	0	0%	0	0%	0	0%	1	3%
Total	63	60	95%	2	3%	1	2%	0	0%	0	0%	3	5%
St. Croix District													
Phone	48	48	100%	0	0%	0	0%	0	0%	0	0%	0	0%
Mail	30	28	93%	1	3%	1	3%	0	0%	0	0%	2	7%
Total	78	76	97%	1	1%	1	1%	0	0%	0	0%	2	3%
USVI													
Total	141	136	96%	3	2%	2	1%	0	0%	0	0%	5	4%

Question 16 – Target Species

Question 16 asked fishers which species they targeted in order to determine which species are targeted by recreational fishers, and the time of the year the fish could be expected in port samples.

Question 16: In the months that you prefer to fish, what are the species of fish or invertebrates (lobster, conch, whelk, crab, etc.) that you target on your trips?

Tables 59 – 81 summarize data on the families and species predominately targeted by boat-based recreational fishers. The number of respondents is the same for all the tables. However, some species were targeted by only a few fishers or not at all (designated by n/a = not applicable). Respondents provided either a common name referring to a fish family (i.e. triggerfish) or the common name for a species (i.e. Queen triggerfish). All responses were recorded. The data for each family are provided in separate tables. The tables provide information on the frequency with which the particular species was targeted by fishers and the months they prefer to fish for each family/species. However, it should be kept in mind that a fisher who only targeted a species for say four months, might only fish these months because the fisher is only on the island during this time of the year and not because of the abundance of the species. The USVI has "snowbirds" who may rent accommodation, own a home or a boat, and visit only seasonally, usually sometime between November to April. Due to the small sample size of the pilot study, the data obtained is not sufficient to identify seasonality of species or peak season. For the purpose of this study, the months fished will be referred to as fishing effort. Peak fishing effort based on the respondents to this survey has been identified for those species in which 20% of the respondents fished for a species. Respondents indicated that popular target species, identified as those sought by 10% or more of the respondents, were targeted year round.

The following are species most commonly targeted (>10% of fishers) by boat-based recreational fishers in the USVI:

- Family Balistidae (Triggerfish): The primary species of Triggerfish (Table 60), harvested in the USVI by both commercial and recreational fishers, is the Queen triggerfish (*Balistes vetula*). Other species of Balistidae are caught and sold by commercial fishers (Kojis 2012), especially on STX, and, although not likely targeted, are probably kept and eaten if caught. Twenty percent of anglers in the USVI targeted species in this family. It was targeted similarly in both districts (19% in STT/STJ and 20% in STX). For some unknown reason, fishers listed this as a target species much more frequently in phone surveys than mail surveys. While 20% of recreational fishers surveyed by phone on STX mentioned triggerfish as a target species, none of the STX fishers completing mail surveys did. Only 4% and 0% of fishers surveyed by mail on STT/STJ and STX, respectively, listed this species while 15% and 20% interviewed by phone did so.
- Family Carangidae (Jacks): A number of species were listed as being targeted by fishers in this family (Table 62). These include: Jacks – *Caranx* spp., Blue runner – *C. crysos*, Permit – *Trachinotus falcatus*, African pompano – *Alectis ciliaris*, Rainbow runner – *Elagatis bipinnulatus*, Horse-eye jack – *C. latus*, Crevalle jack – *C. hippos*. The Blue runner, locally known as the hardnose, was the most commonly targeted species in this family with 14% of fishers indicating that they targeted this species (STT/STJ – 13% of fishers, STX – 16%).

Rainbow runner, Horse-eye jack, and Pompano were only listed as target species in STT/STJ, while Crevalle jacks were only listed as a target species on STX. Twenty three percent of fishers targeted species in this family.

- Family Coryphaenidae (Dolphinfish): Although two species of Dolphinfish, *Coryphaena hippurus* and *C. equisietis* (the smaller Pompano dolphinfish) are present in local waters, respondents only reported catching "dolphinfish" and did not distinguish between the two species in either the phone or mail survey. The species is also called locally by its Hawaiian name, mahi mahi. Dolphinfish were targeted by 37% of fishers in the USVI (STT/STJ – 35%, STX – 39%) (Table 65). More fishers listed dolphinfish in mail surveys than phone surveys (STT/STJ – 26% in phone surveys and 48% in mail surveys, STX – 28% and 77%, respectively).
- Family Lutjanidae (Snapper): This is a commonly targeted family in the USVI for both recreational and commercial fishers with 49% of USVI fishers (50% of STT/STJ and 47% of STX) targeting species in this family. Recreational boat-based fishers reported that they targeted the following Snapper species (Table 71): Blackfin snapper (*Lutjanus buccanella*), Lane snapper (*L. synagris*), Mutton snapper (*L. analis*), Queen snapper (*Eletis oculatus*), Schoolmaster snapper (*L. apodus*), and Yellowtail snapper (*Ocyurus chrysurus*). Fishers most frequently reported targeting "Snapper" (USVI – 30%, STT/STJ - 27%, STX – 32%). For specific species, fishers reported most frequently targeting Yellowtail snapper (18% USVI total; 21% STT/STJ total, 15% STX total). Lane snapper was targeted in both districts but at a low level (2% of fishers). Queen snapper, a deepwater species, was listed by 2% of fishers on STT/STJ. This species falls under the "Deepwater" category listed by STX fishers, which 4% of fishers on STX targeted. Mutton snapper (5% of fishers) and Schoolmaster snapper (7%) were only listed as being targeted in STX. These two species are known to be ciguatoxic in STT/STJ, especially if caught on the south side of the islands. Ciguatera is not as pervasive on STX as on STT/STJ.
- Family Pomadasyidae (formerly Haemulidae) (Grunts): Grunts is the common name for about 10 species of generally small fish of which only two grow large enough to be commonly harvested: White grunt (*Haemulon plumieri*) and the Bluestriped grunt (*H. sciurus*). Large individuals of the French grunt (*H. flavolineatum*) were also sometimes harvested. Grunts were commonly reported to be targeted by fishers (USVI – 19% of fishers targeted grunts, STT/STJ - 17% and STX – 20%) (Table 73). Most of the fishers that reported targeting grunts were interviewed by phone (STT/STJ – Phone: 26%, Mail: 5%, STX – Phone: 26%, Mail 0%). French grunts are one of the most abundant species caught during shore handline fishing tournaments on STX (Tobias, pers. obs.).
- Family Scombridae (Tuna and Mackerel): This is a family commonly targeted by both recreational and commercial fishers. It includes a wide variety of species of which seven were reported as targeted by fishers in this survey. Species identified by fishers include the Tunas - Skipjack tuna, *Katsuwonus pelamis*; Tunny, *Euthynnus alleteratus*; Blackfin tuna, *Thunnus atlanticus*; Yellowfin tuna, *Thunnus albacares*; and Mackerels – Cero, *Scomberomorus regalis*; Kingfish – *S. cavalla;* Wahoo – *Acanthocybium solandri*). Wahoo were the most commonly targeted species (USVI 32% of fishers, STT/STJ – 29%, STX – 34%) (Table 74). The family Scombridae was targeted by 54% of fishers in the USVI (STX - 53% and STT/STJ – 56%).
- Family Serranidae (Groupers): Species in this family were targeted by 32% of fishers in the USVI (Table 77). Fishers identified three species that they targeted: Red hind, *Epinephelus*

guttatus; Coney, *E. fulvus*; Misty grouper, *E. mystacinus.* Red hind was targeted by 26% in the USVI (STT/STJ – 25%, STX – 27%) compared to 6% of USVI fishers targeting Coney (STT/STJ – 10%, STX – 3%). Again, fishers responding to phone surveys reported targeting Red Hind more (STT/STJ – 32%, STX – 35%) than fishers responding to mail surveys (STT/STJ – 14%, STX 0%). Misty grouper was only reported to be targeted by one STT/STJ fisher and no STX fishers.

- Family Sphyraenidae (Barracuda): Fishers primarily target the Great barracuda *Sphyraena barracuda* in this family. Eleven percent of USVI fishers targeted this species (STT/STJ – 6%, STX – 15%) (Table 79). Barracuda are often ciguatoxic in STT/STJ and sometimes in STX (W. Ventura, pers. com.); however, they are routinely eaten on STX and some commercial fishers on STX even target Great barracuda (Kojis and Quinn, 2011).

Families targeted by >3% - 10% of fishers include the following:

- Family Holocentridae: Squirrelfish (*Holocentrus adscensionis*) was targeted by 5% of fishers in the USVI (STT/STJ – 6%, STX – 5%) (Table 68). Most of the species in this family are small in size. Generally, only the Squirrelfish (*H. adscensionis*) obtains a size that fishers are interested in consuming. Squirrelfish are one of the most common species caught in shore handline fishing tournaments.
- Istiophoridae: Marlin are targeted by only 4% of fishers in the USVI (STT/STJ – 4%, STX – 3%) (Table 69). Blue marlin (*Makaira nigricans*) is a highly prized game fish and the primary species in this family targeted by recreational fishers in the USVI. It is often targeted during recreational fishing tournaments and by charter boat operators, especially on STT/STJ. The fishery is predominately a catch and release fishery in the USVI. Catch and release fishing of this species is promoted by the USVI gamefishing industry in order to maintain adequate populations. Blue marlin is currently considered a vulnerable species by the International Union of the Conservation of Nature (IUCN) due to overfishing (Collette et al. 2011). It is illegal to sell species in this family in the United States, though a fisher can take it home for his own consumption. Given the size of the fish targeted in this family, it is often not practical for an individual or his family to prepare, store and consume a fish of this size.
- Family Palinuridae: Spiny lobster were targeted by 8% of boat-based recreational fishers in the USVI (STT/STJ – 10%, STX 7%) (Table 72). At least two species of Panuluridae are harvested in the USVI, *Panuluris argus*, the Spiny lobster, and *P. guttatus*, the Spotted lobster. The former is the most abundant and the primary target of the fishery. This species is regulated by size, gear type, and a prohibition against the harvest of berried females. It is primarily caught by hand or snare by fishers who snorkel or scuba dive. It is a highly prized species in the commercial fishery. A third lobster species, *P. laevicauda*, the Smoothtail spiny lobster, is occasionally found in USVI waters.
- Family Scaridae: Parrotfish are targeted by 6% of boat-based recreational fishers in the USVI (STT/STJ – 6%, STX – 7%) (Table 74). Species in this family are regulated by size restrictions and quotas in the commercial fishery. They are not caught on hook and line because they are herbivores. Recreational fishermen catch this species by spearfishing. Parrotfish are a staple food fish in the USVI, particularly on STX.
- Family Sparidae: Porgies were targeted by 12% of recreational boat-based fishers in STT/STJ (Table 78). No fishers reported targeting this species on STX. Because of differences in the insular shelf platform, the abundance of Porgies may be a function of the

amount of habitat and food availability in each district. STT/STJ, in contrast to STX, appears to have the environment to support sufficient numbers of Porgies to make them a target of recreational fishers.

- Family Strombidae: Queen conch (*Strombus gigas*) was only targeted by four fishers, three in STX and one in STT/STJ (Table 80). Queen conch are found at depths up to 75 m but most often less than 30 m (McCarthy 2007). They are limited in depth to the depth range of seagrass and algae cover on which they feed. STX's relatively shallow shelf supports sufficient populations to sustain a small commercial fishery for this species. The commercial conch harvest occurs primarily by Hispanic fishers on St. Croix using scuba gear. Conch is commonly served in local restaurants and to tourists as a Caribbean delicacy. It is under strict management with a number of regulations that apply to both commercial and recreational fishers. These include a closed season for harvest of Queen conch by commercial and recreational fishers from June 1 to October 30th to protect the species during spawning and a size limit of 9" in length or 3/8" shell lip thickness to allow most individuals to become sexually mature. Two of the recreational fishers on STX targeting Queen conch reported harvesting them year round while the third fisher reported harvesting conch only during the open fishing season (Table 80). The one STT/STJ recreational fisher reported fishing for conch only during January and February, most likely during the fisher's visit to the USVI. Clearly, more education of recreational fishers regarding rules and regulations is required. Recreational fishers are also limited to possession of six conch per day per person up to 24 per boat. Commercial fishers can possess up to 200 conch per boat. There is a maximum allowed commercial annual harvest of 50,000 lbs cleaned meat weight in each district. The commercial harvest level on STT/STJ is always significantly under the maximum harvest limit, while the limit in STX is usually exceeded.

A number of families/species were targeted by only a few recreational boat-based fishers. These include the following which were targeted by 3% or fewer of fishers in the USVI.

- Family Albulidae: Bonefish (*Albula vulpes*) (Table 59) are designated in the USVI as a recreational sportfish for catch and release only. Catch and release fishers are generally "snowbirds," especially retirees, who can afford and have the time to fish solely for fun and not for food as well. Bonefish are said to have tasty flesh but as their common name states are too boney for most fishers targeting food fish. Only fishers in STX stated that they targeted this species. St. Croix has extensive shallow flats, which are ideal habitat for Bonefish. Tourists are known to target Bonefish on St. John (Kojis, pers. obs.). While not commonly targeted as a food fish on STT/STJ, some Bonefish are caught by commercial and shoreline fishers on STX and eaten (W. Tobias, pers. obs.).
- Family Belonidae (Houndfish/locally called Gar): Three species are present in USVI waters (*Tylosurus crocodilus, T. acus, Ablennes hians*) (Table 61). Some confusion may occur identifying *T. crocodilus* and *T. acus*, the latter which is found in more offshore habitat. *A. hians*, commonly called a Flat Needlefish, is easily distinguished by its laterally compressed body and is also found in more offshore waters. Houndfish are not commonly recreationally fished with only two (2%) of fishers reporting targeting this species. Both fishers were located in STT/STJ.
- Family Centropomidae: Snook (*Centropomus unidecimalis*) were targeted by only 2% of fishers (Table 63). This is a species commonly targeted by catch and release recreational fishers and was targeted by fishers (STT/STJ – 1, STX – 2) in both districts. Snook are

ambush predators commonly found inshore along mangrove and open shorelines with turbid waters where concentrations of baitfish are abundant. Snook are also readily consumed as food fish by shoreline fishers (W. Tobias, pers. obs.).

- Family Carcharinhidae (Requiem sharks): Only one fisher (1% of fishers) targeted requiem sharks in the USVI (Table 64). They targeted this species in STT/STJ.
- Family Dasyatidae (Stingrays): Only one fisher (1% of fishers) targeted stingrays in the USVI (Table 66). They targeted this family only in STX.
- Family Elopidae (Tarpon and Ladyfish): Three fishers (3% of fishers) targeted tarpon (*Megalops atlantica*) or Ladyfish (*Elops saurus*) in the USVI (Table 67). One fisher in STT/STJ and two on STX listed species in this family as target species. Tarpon are regulated as a recreational sportfish in the USVI for catch and release only. Tarpon are considered a tourist attraction in certain areas and fishing for them is discouraged. At certain locations along the shoreline, often in front of restaurants, people feed tarpon and as a result 10 – 20 large fish often can be seen, especially in the evening, at these sites. Although take of Tarpon is prohibited, some consumption occurs on STX by shoreline fishers (W. Tobias, pers. obs.).
- Family Labridae (Wrasse): Only one fisher (STT/STJ) reported targeting Hogfish (*Lachnolaimus maximus*) although the fisher might have meant Spanish hogfish (*Bodianus rufus*) (Table 70). Few species in the family Labridae grow large enough to be harvested and many are herbivores or planktivores and thus are not caught on hook and line. Hogfish (*L. maximus*) are good eating and were likely not reported targeted by more fishers because they are not common in the USVI today. Spanish hogfish are a smaller species, but larger individuals are sold by commercial fishers. Recreational fishers likely keep large individuals as well. The only other species in this family that might be recreationally caught is the puddingwife, *Halichoeres radiatus*. It grows to a maximum size of 18 in (Humann 1994). In comparison, the Spanish hogfish and Hogfish grow to a maximum of 2 ft and 3 ft, respectively (Humann 1994). No other species in the family Labridae in the Caribbean is large enough to warrant being targeted by fishers.
- Family Scorpaenidae (Lionfish): Three fishers (two on STX and one on STT/STJ) targeted Lionfish (*Pterois volitans* and *P. miles*) (Table 76). The two species are indistinguishable unless the number of spines is counted. This is an invasive species that is abundant in the USVI and is a voracious predator. Often fishers, especially dive charter operators and recreational spearfishers, target this species to try to reduce its impact on native species. Several lionfish fishing tournaments are held annually in the USVI. The flesh is tasty but it can be ciguatoxic so it is generally not eaten in STT/STJ, where ciguatera is prevalent, but consumed on STX.
- Family Tegulidae: The West Indian topshell or Whelk (*Cittarium pica*) is considered a delicacy throughout the Caribbean and is vulnerable to overharvest. It is an intertidal mollusk inhabiting rocky shores. Only one fisher reported harvesting this species on STT/STJ (Table 81). STT/STJ has more habitat (rocky shoreline), especially on offshore cays, than STX, which are only accessible by boat. The isolated habitat helps maintain population numbers. There are several management regulations related to this species including a minimum harvest size (2 7/16-inch diameter) and a closed season from April 1 – September 30 to protect the species during spawning.

Table 59. *Question 16***:** Family Albulidae (Bonefish – *Albula vulpes*)– Percentage of boat-based recreational fishers targeting species in the family Albulidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Survey Type	Species	Total # of Respondents	Frequency respondents target species		Frequency species targeted compared to other species		Number of respondents that reported fishing for species each month												
			N of respondents fishing for species	% fishers fishing for species	Total Species N		Fishing Effort	J	F	M	A	M	J	J	A	S	O	N	D
St. Thomas/St. John District																			
Phone	Bonefish	31	0	0%	31	0%	n/a												
Mail	Bonefish	21	0	0%	28	0%	n/a												
Total		52	0	0%	59	0%													
St. Croix District																			
Phone	Bonefish	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Bonefish	13	1	8%	16	6%		1	1	1									1
Total		*59*	*2*	*3%*	*53*	*4%*		*2*	*2*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*
USVI																			
Total N for respondents and species	**Bonefish**	**111**	**2**	**2%**	**112**	**2%**		**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**

Table 60. *Question 16*: Family Balistidae (Triggerfish) – Percentage of boat-based recreational fishers targeting species in the family Balistidae (Queen triggerfish – *Balistes vetula*), the time of the year they fished for the species and the frequency with which species were targeted compared to other species.

Family Balistidae (Triggerfish)																				
			Frequency respondents target species		Frequency species targeted compared to other species		Number of respondents that reported fishing for species each month													
Survey Type	Species	Total # of Respondents	N of respondents fishing for species	% fishers fishing for species	Total Species N	%	Fishing Effort	J	F	M	A	M	J	J	A	S	O	N	D
St. Thomas/St. John District																				
Phone	Triggerfish[1]	31	4	13%	31	13%		4	4	4	4	4	4	4	4	4	4	4	4	
Mail	Triggerfish	21	2	10%	28	7%		1	1	1	2	2	2	2	1	1	1	1	1	
Subtotal		*52*	*6*	*12%*	*59*	*17%*	*All yr*	*5*	*5*	*5*	*6*	*6*	*6*	*6*	*5*	*5*	*5*	*5*	*5*	
Phone	Queen triggerfish	31	4	13%	31	13%		3	3	3	3	4	3	3	3	3	3	3	3	
Mail	Queen triggerfish	21	0	0%	28	0%	n/a													
Subtotal	*Balistidae*	*52*	*4*	*8%*	*59*	*7%*		*3*	*3*	*3*	*3*	*4*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	
STT/STJ Total	***Balistidae***	***52***	***10***	***19%***	***59***	***17%***	***All yr***	***8***	***8***	***8***	***9***	***9***	***9***	***9***	***8***	***8***	***8***	***8***	***8***	
St. Croix District																				
Phone	Triggerfish	46	9	20%	37	24%		8	8	8	8	8	8	8	8	9	9	9	9	
Mail	Triggerfish	13	0	0%	16	0%	n/a													
Subtotal		*59*	*9*	*15%*	*53*	*17%*		*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*9*	*9*	*9*	*9*	
Phone	Queen triggerfish	46	3	7%	37	8%	All yr	2	2	2	2	2	2	2	2	3	3	3	3	
Mail	Queen triggerfish	13	0	0%	16	0%	n/a													
Subtotal	*Balistidae*	*59*	*3*	*5%*	*53*	*6%*		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*3*	*3*	*3*	*3*	
STX Total	***Balistidae***	***59***	***12***	***20%***	***53***	***23%***	***Sept-Dec***	***10***	***10***	***10***	***10***	***10***	***10***	***10***	***10***	***12***	***12***	***12***	***12***	

Family Balistidae (Triggerfish)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
USVI																			
Total N for respondents and species	Triggerfish	111	15	14%	112	13%	All yr	13	13	13	14	14	14	14	13	14	14	14	14
	Queen triggerfish	111	7	6%	112	6%		5	5	5	5	6	5	5	5	6	6	6	6
Family Total	**Balistidae**[2]	**111**	**22**	**20%**	**112**	**20%**	**All yr**	**18**	**18**	**18**	**19**	**20**	**19**	**19**	**18**	**20**	**20**	**20**	**20**

[1] Anglers from STX and STT/STJ targeting species in this family stated that they targeted Triggerfish or Queen triggerfish, but not both.

[2] Sum of all respondents targeting species in family Balistidae.

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Table 61. *Question 16***:** Family Belonidae (Needlefish) – Percentage of boat-based recreational anglers targeting species in the family Belonidae (Houndfish/Gar (local name) – *Tylosurus crocodilus, T. acus and Ablennes hians*), the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Belonidae (Needlefish)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Gar	31	1	3%	31	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Houndfish/ Gar	21	1	5%	28	4%												1	1
Total		*52*	*2*	*4%*	*59*	*3%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*2*
St. Croix District																			
Phone	Gar	46	0	0%	37	0%	n/a												
Mail	Gar	13	0	0%	16	0%	n/a												
Total		*59*	*0*	*0%*	*53*	*0%*	***n/a***												
USVI																			
Total N for respondents and species	**Houndfish /Gar**	**111**	**2**	**2%**	**112**	**2%**		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**

Table 62. *Question 16***:** Family Carangidae (Jacks) – Percentage of boat-based recreational fishers targeting species in the family Carangidae (Jacks – *Caranx* spp., Blue runner – *C. crysos*, Permit – *Trachinotus falcatus*, African pompano – *Alectis ciliaris*, Rainbow Runner – *Elagatis bipinnulata*, Horse-eye jack – *C. latus*, Crevalle jack – *C. hippos*) and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Carangidae (Jacks)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents targeted family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Jacks	31	2	6%	31	6%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Jacks	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1
Subotal		*52*	*3*	*6%*	*59*	*5%*		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Phone	Blue runner	31	5	16%	31	*16%*		5	4	4	4	4	4	4	4	4	5	5	5
Mail	Blue runner	21	2	10%	28	*7%*		2	2	2	1	1	1					1	1
Subotal		*52*	*7*	*13%*	*59*	12%	*All yr*	*7*	*6*	*6*	*5*	*5*	*5*	*4*	*4*	*4*	*5*	*6*	*6*
Phone	Permit	31	2	6%	31	6%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Permit	21	0	0%	28	0%	n/a												
Subotal		*52*	*2*	4%	*59*	3%		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Phone	Pompano	31	2	6%	31	6%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Pompano	21	0	0%	28	0%	n/a												
Subotal		*52*	*2*	*4%*	*59*	3%		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*

Family Carangidae (Jacks)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents targeted family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Phone	Rainbow Runner	31	3	10%	31	10%		2	2	2	2	2	3	3	2	2	2	2	2
Mail	Rainbow Runner	21	0	0%	28	0%	n/a												
Subotal		*52*	*3*	6%	*59*	5%		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Phone	Horse-eye jack	31	1	3%	31	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Horse-eye jack	21	0	0%	28	0%	*n/a*												
Subotal		*52*	*1*	*2%*	59	2%		1	1	1	1	1	1	1	1	1	1	1	1
STT/STJ Total	***Family Carangidae***	52	14	27%	59	24%	Nov-Mar	17	16	16	15	15	15	14	14	14	15	16	16
St. Croix District																			
Phone	Jacks	46	3	7%	37	8%		3	3	3	3	3	3	3	3	3	3	3	3
Mail	Jacks	13	0	0%	16	0%	n/a												
Subotal		*59*	*3*	6%	*53*	6%		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Phone	Blue runner	46	7	15%	37	19%		7	7	7	7	7	7	7	7	7	7	7	7
Mail	Blue runner	13	1	8%	16	6%		1	1	1									1
Subotal		*59*	*8*	16%	*53*	15%	*All yr*	*8*	*8*	*8*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*7*	*8*
Phone	Crevalle jack	46	2	4%	37	5%		2	2	2	2	2	2	2	2	2	2	2	2

Family Carangidae (Jacks)																				
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents targeted family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**													
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Mail	Crevalle jack	13	0	0%	16	0%	n/a												
Subotal		*59*	*2*	4%	*52*	4%		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Phone	Permit	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Permit	13	1	8%	16	6%		1	1	1									1
Subotal		*59*	*2*	4%	*53*	4%		*2*	*2*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*
STX Family Total	***Carangidae***	***59***	***11***	**22%**	***53***	**21%**	***Dec-Mar***	***32***	***31***	***31***	***28***	***28***	***29***	***28***	***27***	***27***	***28***	***29***	***31***
USVI – includes only species targeted by recreational fishers in both districts																			
Total N for respondents and species	Jacks	111	6	5%	112	5%		6	6	6	6	6	6	6	6	6	6	6	6
	Blue runner	111	15	14%	112	13%	All yr	15	14	14	12	12	12	11	11	11	12	13	14
	Permit	111	4	4%	112	4%	All yr	4	4	4	3	3	3	3	3	3	3	3	4
Family Total	**Carangidae**	**111**	**25**	**23%**	**112**	**22%**	**Dec – Mar**	**32**	**31**	**31**	**28**	**28**	**29**	**28**	**27**	**27**	**28**	**29**	**31**

Table 63. *Question 16***:** Family Centropomidae (Snook - *Centropomus undecimalis*)) – Percentage of boat-based recreational fishers targeting species in the family Centropomidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Centropomidae (Snook)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Snook	31	0	0%	31	0%	n/a												
Mail	Snook	21	1	5%	28	4%		1											
Total		*52*	*1*	*2%*	*59*	2%		*1*											
St. Croix District																			
Phone	Snook	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Snook	13	1	8%	16	6%		1	1	1									1
Total		*59*	*2*	*3%*	*53*	4%		*2*	*2*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
USVI																			
Total N for respondents and species	**Snook**	**111**	**2**	**2%**	**112**	**2%**		**3**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**

Table 64. *Question 16***:** Family Carcharhinidae (Requiem sharks) – Percentage of boat-based recreational fishers targeting species in the family Carcharhinidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Carcharhinidae (Requiem sharks)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Sharks	31	2	6%	31	6%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Sharks	21	0	0%	28	0%	n/a												
Total		*52*	2	2%	*59*	2%		2	2	2	2	2	2	2	2	2	2	2	2
St. Croix District																			
Phone	Sharks	46	0	0%	37	0%	n/a												
Mail	Sharks	13	0	0%	16	0%	n/a												
Total		*59*	0	0%	*53*	0%													
USVI																			
Total N for respondents and species	**Sharks**	**111**	**1**	**1%**	**112**	**1%**		**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**

Table 65: *Question 16***:** Family Coryphaenidae (Dolphinfish – primarily *Coryphaena hippurus* and *C. equisietis*) – Percentage of boat-based recreational fishers targeting species in the family Coryphaenidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Coryphaenidae (Dolphinfish)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Dolphinfish	31	8	26%	31	26%		6	7	6	7	7	7	7	8	8	8	7	7
Mail	Dolphinfish	21	10	48%	28	36%		8	8	10	10	10	7	7	7	7	8	8	8
Total		*52*	*18*	*35%*	*59*	*31%*	*Mar-May, Oct-Dec*	*14*	*15*	*16*	*17*	*17*	*14*	*14*	*15*	*15*	*16*	*15*	*15*
St. Croix District																			
Phone	Dolphinfish	46	13	28%	37	35%		11	12	13	12	13	12	10	8	8	10	9	11
Mail	Dolphinfish	13	10	77%	16	63%		10	10	10	9	8	8	6	6	6	7	9	9
Total		*59*	*23*	*39%*	*53*	*43%*	*Dec-Jun*	*21*	*22*	*23*	*21*	*21*	*20*	*16*	*14*	*14*	*17*	*18*	*20*
USVI																			
Total N for respondents and species	**Dolphinfish**	**111**	**41**	**37%**	**112**	**37%**	**Oct-Jun**	**35**	**37**	**39**	**38**	**38**	**34**	**30**	**29**	**29**	**33**	**33**	**35**

Table 66: *Question 16*: Family Dasyatidae (Stingrays) – Percentage of boat-based recreational fishers targeting species in the family Dasyatidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Dasyatidae (Stingrays)																			
Survey Type	**Species**	**Total # of Respondents**	**Percentage of respondents targeting species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Stingrays	31	0	0%	31	0%	n/a												
Mail	Stingrays	21	0	0%	28	0%	n/a												
Total		*52*	*0*	*0%*	*59*	*0%*													
St. Croix District																			
Phone	Stingrays	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Stingrays	13	0	0%	16	0%	n/a												
Total		*59*	*1*	*2%*	*53*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
USVI																			
Total N for respondents and species	**Stingrays**	**111**	**1**	**1%**	**112**	**1%**		**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

Table 67: *Question 16***:** Family Elopidae (Tarpons and Ladyfish) – Percentage of boat-based recreational fishers targeting species in the family Elopidae (Tarpon - *Megalops atlantica* or ladyfish *Elops saurus*), the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Elopidae (Tarpons and Ladyfish)																				
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**													
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																				
Phone	Tarpon	31	0	0%	31	0%	n/a													
Mail	Tarpon	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1	1
Total		*52*	*1*	*2%*	*59*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
St. Croix District																				
Phone	Tarpon	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1	1
Mail	Tarpon	13	1	8%	16	6%		1	1	1										1
Total		*59*	*2*	*3%*	*53*	*4%*		*2*	*2*	*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*
USVI																				
Total N for respondents and species	**Tarpon**	**111**	**3**	**3%**	**112**	**3%**		**3**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**3**

Table 68: *Question 16***:** Family Holocentridae (Squirrelfish) – Percentage of boat-based recreational fishers targeting species in the family Holocentridae (Squirrelfish – *Holocentrus adscensionis*) and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Holocentridae (Squirrelfish)																				
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**													
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																				
Phone	Squirrelfish	31	3	10%	31	10%		3	3	3	3	3	3	3	3	3	3	3	3	3
Mail	Squirrelfish	21	0	0%	28	0%	n/a													
Total		*52*	*3*	*6%*	*59*	*5%*		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
St. Croix District																				
Phone	Squirrelfish	46	3	7%	37	8%		3	3	3	3	3	3	3	3	3	3	3	3	3
Mail	Squirrelfish	13	0	0%	16	0%	n/a													
Total		*59*	*3*	*5%*	*53*	*6%*		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
USVI																				
Total N for respondents and species	**Squirrelfish**	**111**	**6**	**5%**	**112**	**5%**		**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**

Table 69. *Question 16*: Family Istiophoridae (Marlin) – Percentage of boat-based recreational fishers targeting species in the family Istiophoridae, the time of the year they fished for the species and the frequency the species was targeted compared to other species.

Family Istiophoridae (Marlin)																					
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**														
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																					
Phone	Marlin	31	0	0%	31	0%	n/a														
Mail	Marlin	21	1	5%	28	4%						1	1	1	1	1	1		
Total		*52*	*1*	*2%*	*59*	*2%*						1	1	1	1	1	1		
Phone	Blue Marlin	31	0	0%	31	0%	n/a														
Mail	Blue Marlin	21	1	5%	28	4%							1	1	1	1	1		
Total		*52*	*1*	*2%*	*59*	*2%*							*1*	*1*	*1*	*1*	*1*		
STT/STJ Total	***Marlin & Blue Marlin - Istiophoridae***	***52***	***2***	***4%***	***59***	***3%***						***1***	***2***	***2***	***2***	***2***	***2***		
St. Croix District																					
Phone	Marlin	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Marlin	13	1	8%	16	6%		1	1	1	1	1	1	1	1	1	1	1	1
STX Total		***59***	**2**	**3%**	***53***	**4%**		***2***	***2***	***2***	***2***	***2***	***2***	***2***	***2***	***2***	***2***	***2***	***2***
USVI																					
Total Total N for respondents and species	**Istiophoridae**	**111**	**4**	**4%**	**112**	**4%**	**Jun-Oct**	**2**	**2**	**2**	**2**	**3**	**4**	**4**	**4**	**4**	**4**	**2**	**2**

Table 70: *Question 16***:** Family Labridae (Wrasses) – Percentage of boat-based recreational fishers targeting species in the family Labridae (Hogfish – *Lachnolaimus maximus*) and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Labridae (Wrasses)																				
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**													
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																				
Phone	Hogfish	31	1	3%	31	3%											1	1		
Mail	Hogfish	21	0	0%	28	0%	n/a													
Total		*52*	1	2%	*59*	2%											1	1		
St. Croix District																				
Phone	Hogfish	46	0	0%	37	0%	n/a													
Mail	Hogfish	13	0	0%	16	0%	n/a													
Total		*59*	0	0%	*53*	0%														
USVI																				
Total N for respondents and species	**Hogfish**	**111**	**1**	**1%**	**112**	**1%**											**1**	**1**		

Table 71. *Question 16***:** Family Lutjanidae (Snappers) – Percentage of boat-based recreational fishers targeting species in the family Lutjanidae (Blackfin snapper (*Lutjanus buccanella*), Lane snapper (*L. synagris*), Mutton snapper (*L. analis*), Queen snapper (*Eletis oculatus*), Schoolmaster snapper (*L. apodus*), and Yellowtail snapper (*Ocyurus chrysurus*), the time of the year they fished for the species, and the frequency with which species are targeted compared to other species.

Family Lutjanidae (Snappers)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Snappers	31	9	29%	31	29%		9	9	9	9	9	9	9	9	9	8	8	8
Mail	Snappers	21	5	24%	28	18%		4	4	4	4	4	4	4	5	5	5	5	5
Subtotal		*52*	*14*	*27%*	*59*	*24%*	*All yr*	*13*	*13*	*13*	*13*	*13*	*13*	*13*	*14*	*14*	*13*	*13*	*13*
Phone	Yellowtail snapper	31	7	23%	31	23%		7	7	7	7	7	7	7	7	7	7	7	7
Mail	Yellowtail snapper	21	4	19%	28	14%		1	2	2	3	3	4	4	3	3	2	1	1
Subtotal		*52*	*11*	*21%*	*59*	*19%*	*Apr-Sep*	*8*	*9*	*9*	*10*	*10*	*11*	*11*	*10*	*10*	*9*	*8*	*8*
Phone	Lane snapper	31	1	3%	31	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Lane snapper	21	0	0%	28	0%	n/a												
Subtotal		*52*	*1*	*2%*	*59*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Phone	Queen snapper	31	0	0%	31	0%	n/a												
Mail	Queen snapper	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1
Subtotal		*52*	*1*	*2%*	59	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
STT/STJ Total	***Family Lutjanidae***	***52***	***26***	***50%***	***59***	***44%***	***Apr - Sep***	***23***	***24***	***24***	***25***	***25***	***26***	***26***	***26***	***26***	***24***	***23***	***23***

Family Lutjanidae (Snappers)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Croix District																			
Phone	Snappers	46	16	35%	37	43%		14	14	14	14	14	14	14	14	15	15	15	16
Mail	Snappers	13	3	23%	16	19%		3	3	3	3	3	3	3	3	3	3	3	3
Subtotal		*59*	*19*	*32%*	*53*	*36%*	*All yr*	*17*	*17*	*17*	*17*	*17*	*17*	*17*	*17*	*18*	*18*	*18*	*19*
Phone	Yellowtail snapper	46	9	20%	37	24%		8	8	8	8	8	8	8	8	9	9	8	8
Mail	Yellowtail snapper	13	0	0%	16	0%	n/a												
Subtotal		*59*	*9*	*15%*	*53*	*17%*	All yr	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
Phone	Lane snapper	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Lane snapper	13	0	0%	16	0%	n/a												
Subtotal		*59*	*1*	*2%*	*53*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Phone	Mutton snapper	46	3	7%	37	8%		2	2	2	2	2	2	2	2	2	2	3	2
Mail	Mutton snapper	13	0	0%	16	0%	n/a												
Subtotal		*59*	*3*	*5%*	*53*	*6%*		2	2	2	2	2	2	2	2	2	2	2	2
Phone	Schoolmaster snapper	46	4	9%	37	11%		4	4	4	4	4	4	4	4	4	4	4	4
Mail	Schoolmaster snapper	13	0	0%	16	0%	n/a												
Subtotal		*59*	*4*	*7%*	*53*	*8%*		*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*

Family Lutjanidae (Snappers)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Phone	Deepwater snapper	46	2	4%	37	5%		2	2	2	2	2	2	2	2	1	1	1	1
Mail	Deepwater snapper	13	0	0%	16	0%	n/a												
Subtotal		*59*	*2*	*4%*	*53*	*4%*		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*1*	*1*	*1*	*1*
Phone	Blackfin snapper	46	1	2%	37	3%							1	1	1				
Mail	Blackfin snapper	13	0	0%	16	0%	n/a												
Subtotal		*59*	*1*	*2%*	*53*	*2%*							*1*	*1*	*1*				
STX Family Total	***Lutjanidae***	***59***	***28***	***47%***	***53***	***53%***	***Sept-Oct/Dec***	***34***	***34***	***34***	***34***	***34***	***35***	***35***	***35***	***36***	***36***	***35***	***36***
USVI – includes totals for species targeted by recreational fishers in both districts and family total																			
Total N for respond-ents and species	Snappers	111	33	30%	112	29%	All yr	30	30	30	30	30	30	30	31	32	31	31	32
	Yellowtail snapper	111	20	18%	112	18%	Apr-Oct	16	17	17	18	18	19	19	18	19	18	16	16
	Lane snapper	111	2	2%	112	2%		2	2	2	2	2	2	2	2	2	2	2	2

Family Lutjanidae (Snappers)																			
Survey Type	Species	Total # of Respondents	Frequency respondents target family/species		Frequency species targeted compared to other species		Number of respondents that reported fishing for species each month												
			N of respondents fishing for species	%	Total Species N	%	Fishing Effort	J	F	M	A	M	J	J	A	S	O	N	D
USVI Family Total	Lutjanidae	111	54	49%	112	48%	Jul - Oct	57	58	58	59	59	61	61	61	62	60	58	59

Table 72: *Question 16***:** Family Palinuridae (Spiny Lobster) – Percentage of boat-based recreational fishers targeting species in the family Palinuridae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Palinuridae (Lobster)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Lobster	31	2	6%	31	6%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Lobster	21	3	14%	28	11%		3	3	3	3	3	3	3	3	3	3	3	3
Total		*52*	5	10%	*59*	8%	All yr	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*
St. Croix District																			
Phone	Lobster	46	3	7%	37	8%		3	3	3	3	3	3	3	3	3	3	3	3
Mail	Lobster	13	1	8%	16	6%		1	1	1	1	1	1	1	1	1	1	1	1
Total		*59*	4	7%	*53*	8%		*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
USVI																			
Total N for respond-ents and species	**Lobster**	**111**	**9**	**8%**	**112**	**8%**		**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**

Table 73: *Question 16***:** Family Pomadaysidae (Grunts) – Percentage of boat-based recreational fishers targeting species in the family Pomadaysidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Pomadaysidae (Grunts)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents targeting species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Grunts	31	8	26%	31	26%		8	8	8	8	8	8	8	8	8	8	8	8
Mail	Grunts	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1
Total		*52*	*9*	*17%*	*59*	*15%*	*All yr*	*9*	*9*	*9*	*9*	*9*	*9*	*9*	*9*	*9*	*9*	*9*	*9*
St. Croix District																			
Phone	Grunts	46	12	26%	37	32%		12	12	12	12	12	12	12	12	12	12	12	12
Mail	Grunts	13	0	0%	16	0%	n/a												
Total		*59*	*12*	*20%*	*53*	*23%*		*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*	*12*
USVI																			
Total N for respondents and species	**Grunts**	**111**	**21**	**19%**	**112**	**19%**	**All yr**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**	**21**

Table 74: *Question 16*: Family Scaridae (Parrotfish) – Percentage of boat-based recreational fishers targeting species in the family Scaridae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Scaridae (Parrotfish)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Parrotfish	31	3	10%	31	10%		3	3	3	3	3	3	3	3	3	3	3	3
Mail	Parrotfish	21	0	0%	28	0%	n/a												
Total		*52*	*3*	*6%*	*59*	*5%*		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
St. Croix District																			
Phone	Parrotfish	46	4	9%	37	11%		4	4	4	4	4	4	4	4	4	4	4	4
Mail	Parrotfish	13	0	0%	16	0%	n/a												
Total		*59*	*4*	*7%*	*53*	*8%*		*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	*4*
USVI																			
Total N for respondents and species	**Parrotfish**	**111**	**7**	**6%**	**108**	**6%**		**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**

Table 75. *Question 16***:** Family Scombridae (Tuna and Mackerel) – Percentage of boat-based recreational fishers targeting species in the family Scombridae (Species identified by fishers: Tunas: Skipjack tuna – *Katsuwonus pelamis*, Tunny – *Euthynnus alleteratus*, Blackfin tuna – *Thunnus atlanticus*, Yellowfin tuna – *Thunnus albacares*) (Mackerels: Cero – *Scomberomorus regalis*, Kingfish – *S. cavalla*, Wahoo – *Acanthocybium solandri*), the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Scombridae (Tuna and Mackerel)																				
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**													
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																				
Phone	Tuna	31	6	19%	31	19%		4	4	4	4	5	4	5	6	6	6	6	5
Mail	Tuna	21	7	33%	28	25%		6	6	6	7	7	7	7	7	6	6	5	5
Subtotal		*52*	*13*	*25%*	*59*	*22%*		*10*	*10*	*10*	*11*	*12*	*11*	*12*	*13*	*12*	*12*	*11*	*10*
Phone	Skipjack tuna	31	0	0%	31	0%	n/a												
Mail	Skipjack tuna	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1
Subtotal		*52*	*1*	*2%*	*59*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Phone	Tunny	31	0	0%	31	0%	n/a												
Mail	Tunny	21	2	10%	28	7%		2	2	2	2	2	2	2	2	2	2	2	2
Subtotal		*52*	*2*	*4%*	*59*	*3%*		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
Phone	Blackfin tuna	31	0	0%	31	0%	n/a												
Mail	Blackfin tuna	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1
Subtotal		*52*	*1*	*2%*	*59*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*

Family Scombridae (Tuna and Mackerel)																				
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**													
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Phone	Mackerel	31	4	13%	31	13%		4	4	4	4	4	4	4	4	4	4	4	4
Mail	Mackerel	21	2	10%	28	7%		1	1	1	2	2	2	2	2	2	2	1	1
Subtotal		*52*	*6*	*12%*	*59*	*10%*	*All yr*	*5*	*5*	*5*	*6*	*6*	*6*	*6*	*6*	*6*	*6*	*5*	*5*
Phone	Cero mackerel	31	0	0%	31	0%	n/a												
Mail	Cero mackerel	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1
Subtotal		*52*	*1*	*2%*	*59*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Phone	Kingfish	31	3	10%	31	10%		2	2	2	2	2	3	3	3	2	2	2	2
Mail	Kingfish	21	3	14%	28	11%		3	3	3	3	3	3	2	1	2	2	3	3
Subtotal		*52*	*6*	*12%*	*59*	*10%*	*All yr*	*5*	*5*	*5*	*5*	*5*	*6*	*5*	*4*	*4*	*4*	*5*	*5*
Phone	Wahoo	31	7	23%	31	23%		3	3	3	5	5	5	5	3	3	7	6	4
Mail	Wahoo	21	8	38%	28	29%		8	7	6	6	6	5	5	5	5	7	8	7
Subtotal		*52*	*15*	*29%*	*59*	*25%*	*Apr-Jul Oct-Feb*	*11*	*10*	*9*	*11*	*11*	*10*	*10*	*8*	*8*	*14*	*14*	*11*
STT/STJ Family Total	***Scombridae***	***52***	***29***	***56%***	***59***	***49%***	***Apr – Aug, Oct - Nov***	***36***	***35***	***34***	***38***	***39***	***38***	***38***	***36***	***35***	***41***	***39***	***36***
St. Croix District																			
Phone	Tuna	46	9	20%	37	24%	Apr - Jul	5	6	7	8	9	9	9	7	5	5	5	5
Mail	Tuna	13	6	46%	16	38%	All yr	6	6	6	6	5	6	5	5	5	5	6	6
Subtotal		*59*	*15*	*25%*	*53*	*28%*	*Feb-Aug*	*11*	*12*	*13*	*14*	*14*	*15*	*14*	*12*	*10*	*10*	*11*	*11*

Family Scombridae (Tuna and Mackerel)																				
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**													
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Phone	Skipjack tuna	*46*	*1*	*2%*	*37*	*3%*		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Skipjack tuna	13	0	0%	16	0%	n/a												
Subtotal		*59*	*1*	*2%*	*53*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Phone	Blackfin tuna	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Blackfin tuna	13	0	0%	16	0%	n/a												
Subtotal		*59*	*1*	*2%*	*53*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Phone	Yellowfin tuna	46	2	4%	37	5%		2	1	1	1	1	1	1	1	2	2	2	2
Mail	Yellowfin tuna	13	0	0%	16	0%	n/a												
Subtotal		*59*	*2*	*3%*	*53*	*4%*		*2*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*2*	*2*	*2*	*2*
Phone	Mackerel	46	2	4%	37	5%		1	1	1	1	1	2	2	1	1	1	1	1
Mail	Mackerel	13	0	0%	16	0%	n/a												
Subtotal		*59*	*2*	*3%*	*53*	*4%*		*1*	*1*	*1*	*1*	*1*	*2*	*2*	*1*	*1*	*1*	*1*	*1*
Phone	Cero Mackerel	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Cero Mackerel	13	0	0%	16	0%	n/a												

Family Scombridae (Tuna and Mackerel)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Subtotal		*59*	*1*	*2%*	*53*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
Phone	Kingfish	46	4	9%	37	11%		2	3	4	3	3	3	3	2	2	3	3	2
Mail	Kingfish	13	1	8%	16	6%		1	1	1	1	1	1	1	1	1	1	1	1
Subtotal		*59*	*5*	*8%*	*53*	*9%*		*3*	*4*	*5*	*4*	*4*	*4*	*4*	*3*	*3*	*4*	*4*	*3*
Phone	Wahoo	46	10	22%	37	27%		7	5	6	6	6	6	5	4	8	10	10	9
Mail	Wahoo	13	10	77%	16	63%		9	10	10	10	9	9	7	7	7	7	9	9
Subtotal		*59*	*20*	*34%*	*53*	*38%*	*Sept-Jun*	*16*	*15*	*16*	*16*	*15*	*15*	*12*	*11*	*15*	*17*	*19*	*18*
Phone	Pelagics	46	0	0%	37	0%	n/a												
Mail	Pelagics	13	1	8%	16	6%		1	1	1	1	1	1	1	1	1	1	1	1
Subtotal		*59*	*1*	*2%*	*53*	*2%*		1	1	1	1	1	1	1	1	1	1	1	1
STX Family Total	***Scombridae***	***59***	***31***	***53%***	***52***	***60%***	***Mar – May, Oct – Dec***	***37***	***37***	***40***	***40***	***39***	***41***	***37***	***32***	***35***	***38***	***41***	***39***
USVI – includes species targeted by recreational fishers in both districts and family total																			
Total N for respond-ents and species	Tuna	111	28	25%	112	25%	Apr-Aug	21	22	23	25	26	26	26	25	22	22	22	21
	Skipjack	111	2	2%	112	2%		2	2	2	2	2	2	2	2	2	2	2	2
	Blackfin tuna	111	2	2%	112	2%		2	2	2	2	2	2	2	2	2	2	2	2

Family Scombridae (Tuna and Mackerel)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
	Mackerel	111	8	7%	112	7%		6	6	6	7	7	8	8	7	7	7	6	6
	Cero mackerel	111	2	2%	112	2%		2	2	2	2	2	2	2	2	2	2	2	2
	Kingfish	111	11	10%	112	10%	Feb-Jul	8	9	10	9	9	10	9	7	7	8	9	8
	Wahoo	111	35	32%	112	31%	Oct-Jul	27	25	25	27	26	25	22	19	23	31	33	29
USVI Family Total	**Scombridae**	**111**	**60**	**54%**	**112**	**54%**	**Mar – Jul, Oct - Dec**	**68**	**68**	**70**	**74**	**74**	**75**	**71**	**64**	**65**	**74**	**76**	**70**

Table 76: *Question 16***:** Family Scorpaenidae (Lionfish – *Pterois volitans and P. miles*) – Percentage of boat-based recreational fishers targeting species in the family Scorpaenidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Scorpaenidae (Lionfish)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Lionfish	31	2	6%	31	6%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Lionfish	21	0	0%	28	0%	n/a												
Total		*52*	*2*	*4%*	*59*	*3%*		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
St. Croix District																			
Phone	Lionfish	46	1	2%	37	3%		1	1	1	1	1	1	1	1	1	1	1	1
Mail	Lionfish	13	0	0%	16	0%	n/a												
Total		*59*	*1*	*2%*	*53*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
USVI																			
Total N for respondents and species	**Lionfish**	**111**	**3**	**3%**	**112**	**3%**		**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**

Table 77. *Question 16***:** Family Serranidae (Groupers) – Percentage of boat-based recreational fishers targeting species in the family Serranidae (Species identified by fishers: Red hind, *Epinephelus guttatus*; Coney, *E. fulvus*; Misty grouper, *E. mystacinus*) and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Serranidae (Groupers)																				
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**													
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																				
Phone	Grouper	31	5	16%	31	16%		5	5	5	5	5	5	4	4	4	4	4	4	
Mail	Grouper	21	0	0%	28	0%	n/a													
Subtotal		*52*	*5*	*10%*	*59*	*8%*	All yr	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	
Phone	Red Hind	31	10	32%	31	32%		9	9	9	9	10	9	9	9	9	9	9	9	
Mail	Red Hind	21	3	14%	28	11%		2	2	3	2	2	2	2	2	2	2	2	2	
Subtotal		*52*	*13*	*25%*	*59*	22%	*All yr*	*11*	*11*	*12*	*11*	*12*	*11*	*11*	*11*	*11*	*11*	*11*	*11*	
Phone	Rock Hind	31	1	3%	31	3%		1	1	1	1	1	1	1	1	1	1	1	1	
Mail	Rock Hind	21	0	0%	28	0%	n/a													
Subtotal		*52*	*1*	*2%*	*59*	*2%*		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	
Phone	Coney	31	3	10%	31	10%		2	2	2	2	3	2	2	2	2	2	2	2	
Mail	Coney	21	2	10%	28	7%		2	2	2	2	2	2	2	2	2	2	2	2	
Subtotal		*52*	*5*	*10%*	*59*	*8%*	*All yr*	*4*	*4*	*4*	*4*	*5*	*4*	*4*	*4*	*4*	*4*	*4*	*4*	
Phone	Misty	31	0	0%	31	0%	n/a													
Mail	Misty	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1	
Subtotal		*52*	*1*	*2%*	*59*	2%		*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	*1*	

Family Serranidae (Groupers)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
STT/STJ Family Total	***Serranidae***	***52***	***19***	***37%***	***59***	***32%***	***All yr***	***22***	***22***	***22***	***22***	***24***	***22***	***21***	***21***	***21***	***21***	***21***	***21***
St. Croix District																			
Phone	Grouper	46	2	4%	37	5%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Grouper	13	1	8%	16	6%		1	1	1	1	1	1	1	1	1	1	1	1
Subtotal		*59*	*3*	*5%*	*53*	*6%*		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
Phone	Red Hind	46	16	35%	37	43%		16	16	15	15	15	15	15	15	15	15	15	16
Mail	Red Hind	13	0	0%	16	0%	n/a												
Subtotal		*59*	*16*	*27%*	*53*	*30%*	All yr	16	16	15	15	15	15	15	15	15	15	15	16
Phone	Rock Hind	46	0	0%	37	0%	n/a												
Mail	Rock Hind	13	0	0%	16	0%	n/a												
Subtotal		59	0	0%	53	0%													
Phone	Coney	46	2	4%	37	5%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Coney	13	0	0%	16	0%	n/a												
Subtotal		*59*	*2*	*3%*	*53*	*4%*		*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*	*2*
STX Family Total	***Serranidae***	***59***	***17***	***29%***	***53***	***32%***	***All yr***	***21***	***21***	***20***	***20***	***20***	***20***	***20***	***20***	***20***	***20***	***20***	***21***
USVI																			
Total N for respondents and species	Grouper	111	8	7%	112	7%		8	8	8	8	8	8	7	7	7	7	7	7

Family Serranidae (Groupers)																				
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target family/species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**													
			N of respondents fishing for species	**%**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
	Red Hind	111	29	26%	112	27%	All yr	27	27	27	26	27	26	26	26	26	26	26	27
	Rock Hind	111	1	1%	112	1%		1	1	1	1	1	1	1	1	1	1	1	1
	Coney	111	7	6%	112	6%		6	6	6	6	7	6	6	6	6	6	6	6
USVI Family Total	**Serranidae**	**111**	**36**	**32%**	**112**	**32%**	**Jan - Mar**	**42**	**42**	**42**	**41**	**42**	**41**	**40**	**40**	**40**	**40**	**40**	**41**

Table 78: *Question 16***:** Family Sparidae (Porgies) – Percentage of boat-based recreational fishers targeting species in the family Sparidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Sparidae (Porgies)																					
Survey Type	**Species**	**Total # of Respondents**	**Percentage of respondents targeting species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**														
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																					
Phone	Porgies	31	5	16%	31	16%		5	4	4	4	4	4	4	4	4	4	4	4	4	5
Mail	Porgies	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1	1	1
Total		*52*	*6*	*12%*	*59*	*10%*	*All yr*	*6*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*5*	*6*
St. Croix District																					
Phone	Porgies	46	0	0%	37	0%	n/a														
Mail	Porgies	13	0	0%	16	0%	n/a														
Total		*59*	0	0%	*53*	0%															
USVI																					
Total N for respondents and species	**Porgies**	**111**	**6**	**5%**	**112**	**5%**		**6**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**6**

Table 79: *Question 16***:** Family Sphyraenidae (Barracuda – *Sphyraena barracuda*) – Percentage of boat-based recreational fishers targeting species in the family Sphyraenidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Sphyraenidae (Barracuda)																			
Survey Type	**Species**	**Total # of Respondents**	**Number & Percentage of respondents targeting species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Barracuda	31	2	6%	31	6%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Barracuda	21	1	5%	28	4%		1	1	1	1	1	1	1	1	1	1	1	1
Total		*52*	*3*	*6%*	*59*	5%		*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*	*3*
St. Croix District																			
Phone	Barracuda	46	8	17%	37	22%		8	8	8	8	8	8	8	8	8	8	8	8
Mail	Barracuda	13	1	8%	16	6%		1	1	1									1
Total		*59*	*9*	*15%*	*53*	17%	*All yr*	*9*	*9*	*9*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*8*	*9*
USVI																			
Total N for respondents and species	**Barracuda**	**111**	**12**	**11%**	**112**	**11%**	**All yr**	**12**	**12**	**12**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**11**	**12**

Table 80: *Question 16***:** Family Strombidae (Queen conch, *Strombus gigas*) – Percentage of boat-based recreational fishers targeting species in the family Strombidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Strombidae (Queen conch)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Queen conch	31	1	3%	31	3%		1	1										
Mail	Queen conch	21	0	0%	28	0%													
Total		*52*	*1*	*2%*	*59*	*2%*		*1*	*1*										
St. Croix District																			
Phone	Queen conch	46	2	4%	37	5%		2	2	2	2	2	2	2	2	2	2	2	2
Mail	Queen conch	13	1	8%	16	6%		1	1	1	1	1						1	1
Total		*59*	*3*	*5%*	*53*	*6%*		*3*	*3*	*3*	*3*	*3*	*2*	*2*	*2*	*2*	*2*	*3*	*3*
USVI																			
Total N for respondents and species	**Queen[1] conch**	**111**	**4**	**4%**	**112**	**4%**		***4***	***4***	***3***	***3***	***3***	***2***	***2***	***2***	***2***	***2***	***3***	***3***

[1] November 1st to May 31st is the open season for harvesting queen conch, assuming the Annual Catch Limit has not been met. Harvest and possession of queen conch is prohibited from June to end of October.

Table 81: *Question 16*: Family Tegulidae (West Indian Top Shell or Whelk – *Cittarium pica*) – Percentage of boat-based recreational fishers targeting species in the family Tegulidae and the time of the year they fished for the species and the frequency with which species are targeted compared to other species.

Family Tegulidae (West Indian Top Shell or Whelk)																			
Survey Type	**Species**	**Total # of Respondents**	**Frequency respondents target species**		**Frequency species targeted compared to other species**		**Number of respondents that reported fishing for species each month**												
			N of respondents fishing for species	**% fishers fishing for species**	**Total Species N**	**%**	**Fishing Effort**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
St. Thomas/St. John District																			
Phone	Whelk	31	0	0%	31	0%	n/a												
Mail	Whelk	21	1	5%	28	4%		1	1	1							1	1	1
Total		*52*	1		*59*			*1*	*1*	*1*							*1*	*1*	*1*
St. Croix District																			
Phone	Whelk	46	0	0%	37	0%	n/a												
Mail	Whelk	13	0	0%	16	0%	n/a												
Total		*59*	0	0%	*53*	0%													
USVI																			
Total N for respondents and species	**Whelk[1]**	**111**	**1**	**1%**	**112**	**1%**		**1**	**1**	**1**							**1**	**1**	**1**

[1] October to March is the open season for harvesting whelks. Harvest and possession of whelks is prohibited from April to end of September.

Question 17 – Issues Affecting Respondents Recreational Fishing Experience

In Question 17, respondents were asked to identify and prioritize the three most important issues affecting their recreational fishing experience.

17. What are the three most important issues affecting your recreational fishing experience in order of priority?

The number of respondents providing comments to Question 17 was greater by phone than mail in both STT/STJ and STX Districts. On STT/STJ, 84% of the respondents provided responses to this question in phone interviews vs 69% by mail. On STX, 84% of respondents provided responses to this question in phone interviews vs 58% by mail (Table 82). Collectively, 75% of USVI respondents provided comments and 25% did not with 84% of respondents interviewed by phone providing comments vs 63% surveyed by mail.

Table 82: *Question 17:* The number and percentage of respondents that provided comments in response to issues of concern to them as recreational fishers.

	Number and Percent of Respondents													
	St. Thomas/St. John District				St. Croix District				USVI					
	Phone		Mail		Phone		Mail		Phone		Mail		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Respondents with comments	26	84%	22	69%	41	84%	18	58%	67	84%	40	63%	107	75%
Respondents with no comments	5	16%	10	31%	8	16%	13	42%	13	16%	23	37%	36	25%
Total	31	100%	32	100%	49	100%	31	100%	80	100%	63	100%	143	100%

Based on the comments received, the issues were grouped 15 general categories: Marine Protected Areas, Overfishing, Need for Fisheries Management, Enforcement, Against Rules and Regulations, For Rules and Regulations, Need for Fisheries Enhancement, Need for More and Improved/Repaired Boat Access Facilities, Need for Recreational Fishing Education, Lionfish Control, Bait, Cost of Fishing, Weather, Environmental Degradation and Other (Tables 83 & 84). Specific comments made by respondents were listed beneath the general category. For each issue of concern, we summed the number of times the issue was mentioned either as a primary, secondary and tertiary issue. This served as the numerator in our calculations. We then summed all the comments provided for primary, secondary and tertiary issues. There were 120 comments from STX and 118 comments from STT/STJ. These numbers served as our denominator.

On STX, Marine Protected Areas, Overfishing and Weather were the three most important issues identified (13%, 12% and 12%, respectively) (Table 83). Overfishing (23%), Enforcement (13%) and Environmental Degradation (11%) were identified as the three most important issues in STT/STJ (Table 84). Enforcement and the Need for Fisheries Enhancement on STX and Cost of Fishing and Weather on STT/STJ received 8% of the comments, followed by the Need for More and Improved/Repaired Boat Access Facilities (6%) in both districts. Lionfish Control was identified as a more important issue to recreational fishers on STX (3%) than on STT/STJ (0%).

The Need for Fisheries Management was mentioned by just one respondent in both STX and STT/STJ.

Table 83. *Question 17*: A summary of the primary, secondary and tertiary issues of concern expressed by recreational fishers in the St. Croix District in phone interviews and mail surveys. N = number of responses pertaining to each specific issue. Issues in bold are general headings. Issues in normal type are the specific comments by fishers.

Issues of Concern	Primary Issue		Secondary Issue		Tertiary Issue			
	N Phone	N Mail	N Phone	N Mail	N Phone	N Mail	Total N	%
Marine Protected Areas	**9**	**1**	**4**		**1**		**15**	**13%**
• NPS regulations too restrictive for boats with for fishing gear onboard in park waters	1							
• Too many BIRNM (Buck Island Reef National Monument) restrictions	2							
• BIRNM boundaries		1						
• Open restricted areas to catch and release fishing/fishing/availability of fishing area	1		1		1			
• Too many restricted fishing areas/protected areas/open restricted areas to fishing/ not enough areas for recreational fishers	1		2					
• Area closures too large	3							
• Shoreline access for fishing/shoreline access at Boy Scout property	1		1					
Overfishing	**7**	**1**	**5**		**1**		**14**	**12%**
• Overfishing by commercial fishers on reef fish	1							
• Overfishing	1		3		1			
• Lack of fish	4							
• Catchability of fish			1					
• Too many fishers			1					
• Distance from land to fish		1						
Recreational fishers catch too many small fish	**1**							
Need for Fisheries Management		**1**					**1**	**1%**
• Fish trap hazard around Buck Island for boaters		1						
Enforcement	**2**	**1**	**4**	**1**	**2**		**10**	**8%**
• Illegal use of gill nets and netting of fish	1	1						
• Discarded net on corals and on shore			1					
• People not following rules and regulations	1							
• Lack of enforcement/patrols			1					
• Recreational fishers should not sell fish			1					
• Vehicle and boat vandalism				1				

Issues of Concern	Primary Issue		Secondary Issue		Tertiary Issue			
	N Phone	N Mail	N Phone	N Mail	N Phone	N Mail	Total N	%
• Harvest of juvenile of fish and conch/juvenile fish and lobster					1			
• No response to issues reported to DFW[1]								
• Foreign fishing fleets					1			
• Safe boating use			1					
Against Rules and Regulations	**5**		**1**		**1**		**7**	**6%**
• Rules and regulations too strict	3							
• Catch limits too low for conch	1							
• Eliminate closed seasons for recreational fishing	1							
• Catch limits too low			1					
• Species restrictions					1			
For Rules and Regulations		**1**		**2**			**3**	**3%**
• Not having a license/would like to have a license		1		1				
• Fish pots harvesting small fish				1				
Need for fisheries enhancement	**3**	**1**	**3**	**1**		**1**	**9**	**8%**
• Need more FADs/lack of FADs	2	1	3	1		1		
• Need more artificial reefs	1							
Need for more and improved/repaired boat access facilities	**3**	**1**	**1**		**1**	**1**	**7**	**6%**
• Boat access facilities need improvement/access to boat ramps/bad condition	1		1					
• Need no swimming signs at the Frederiksted boat access	1							
• Condition of Frederiksted Fisherman's ramp/pier poor						1		
• Condition of ramps	1							
• Need more boat access facilities/fueling sites					1			
• Need light at the molasses dock		1						
• No mooring buoys in Hull Bay								
Need for recreational fishing education	**2**		**2**	**1**		**1**	**7**	**6%**
• Need greater distribution of fishing regulations	1							
• Learn more about fish and fishing techniques	1							
• Why is license needed?			1					
• Congress and legislators need to be more conscious of local fishing and fishers			1					

Issues of Concern	Primary Issue		Secondary Issue		Tertiary Issue			
	N Phone	N Mail	N Phone	N Mail	N Phone	N Mail	Total N	%
• Knowledge of closed areas for fishing						1		
• Knowledge of catch and release rules				1				
Lionfish control	**3**				**1**		**4**	**3%**
Over-abundance of lionfish	3							
Lionfish depleting resources					1			
Bait			**1**	**1**	**1**		**3**	**3%**
• Availability to purchase live bait/lack of round robin bait			1		1			
• Bait availability???				1				
Cost of fishing		**2**	**2**	**1**	**2**		**7**	**6%**
• Fuel cost		2		1	2			
• Cost of recreational fishing			2					
Weather	**5**	**3**	**1**	**2**	**1**	**2**	**14**	**12%**
• Bad weather/Rough sea conditions/High waves	5	3	1	2	1	2		
Environmental degradation	**1**	**1**	**1**		**1**		**4**	**3%**
• Polluted waters/clean ocean	1							
• Land-based pollution			1					
• Terrestrial runoff					1			
Water quality at some beaches unsafe		1						
Other	**1**	**5**	**1**	**3**	**2**	**3**	**15**	**13%**
• Lack of time to fish/work???	1	1	1		2	1		
• Someone to fish with/Friends		1		3		1		
• Use recreational fishing to relax and have fun		1						
• Open ocean sea conditions		1						
• The ability to be able to fish		1						
• Deepwater available a short distance offshore			1			1		
Lack of equipment								
TOTAL N Reponses	**41**	**18**	**27**	**12**	**14**	**8**	**120**	**100%**

[1] DFW = Division of Fish and Wildlife

Table 84. *Question 17*: A summary of the primary, secondary and tertiary issues of concern expressed by recreational fishers in the St. Thomas/St. John District in phone interviews and mail surveys. The number in the cell denotes N, number of responses pertaining to each specific issue. Issues in bold are general headings. Issues in normal type are the specific comments by fishers relevant to each general heading.

Issues of Concern	Primary Issue		Secondary Issue		Tertiary Issue		Total	
	N Phone	N Mail	N Phone	N Mail	N Phone	N Mail	N	%
Marine Protected Areas	**3**	**1**	**2**				**6**	**5**
• NPS regulations too restrictive for boats with for fishing gear onboard in park waters								
• Too many BIRNM (Buck Island Reef National Monument) restrictions								
• BIRNM boundaries								
• Open restricted areas to catch and release fishing/fishing/availability of fishing area/bait fishing in National Park waters	1	1						
• Too many restricted fishing areas/protected areas/open restricted areas to fishing/ not enough areas for recreational fishers			2					
• Area closures too large	1							
• Shoreline access for fishing/shoreline access at Boy Scout property/access to Megan's Bay	1							
Overfishing	**9**	**6**	**3**	**4**	**3**	**2**	**27**	**23**
• Overfishing by commercial fishers on reef fish								
• Commercial overfishing	1	2	1					
• Overfishing	2	2		2	1			
• Overfishing bait/by charter boats	2			2				
• Overfishing by spearfishers					1			
• Lack of fish	1	2	1			1		
• Catchability of fish								
• Too many fishers/other boats	*3*					1		
• Distance from land to fish			1					
• Fish size decreasing					1			
Recreational fishers catch too many small fish								
Need for Fisheries Management		**1**					**1**	**1**
• Fish trap hazard around Buck Island for boaters								
• Ability to have fish traps for personal use		1						
Enforcement	**1**		**3**	**5**	**3**	**3**	**15**	**13**
• Illegal use of gill nets, seine nets and netting of fish					1			

Issues of Concern	Primary Issue		Secondary Issue		Tertiary Issue		Total	
	N Phone	N Mail	N Phone	N Mail	N Phone	N Mail	N	%
• Discarded net on corals and on shore								
• People not following rules and regulations								
• Lack of enforcement/patrols	1			2		1		
• Recreational fishers should not sell fish								
• Vehicle and boat vandalism/theft					1			
• Harvest of juvenile of fish and conch/juvenile fish and lobster			1	1				
• No response to issues reported to DFW[1]			1					
• Foreign fishing fleets								
• Illegal commercial fishing				1	1			
• Illegal fish sales from trucks parked on road						1		
• Illegal fishing during closed season						1		
• Sabotage of mooring buoys			1					
• Safe boating use				1				
Against Rules and Regulations			**1**		**1**	**1**	**3**	**3**
• Rules and regulations too strict			1			1		
• Catch limits too low for conch								
• Eliminate closed seasons for recreational fishing								
• Catch limits too low								
• Species restrictions/no restrictions					1			
For Rules and Regulations		**2**			**2**	**1**	**5**	**4**
• Not having a license/would like to have a license								
• Fish pots harvesting small fish								
• Need size limits					1			
• Need no-fish zones for commercial fishers					1			
• Need sustainable fisheries/supported by tourism		2				1		
Need for fisheries enhancement			**1**	**1**			**2**	**2**
• Need more FADs/lack of FADs			1	1				
• Need more artificial reefs								
Need for more and improved/repaired boat access facilities	**1**	**2**	**1**	**1**	**1**	**1**	**7**	**6**
• Boat access facilities need improvement/access to boat ramps/bad condition								
• Need no swimming signs at the Frederiksted boat access								

Issues of Concern	Primary Issue		Secondary Issue		Tertiary Issue		Total	
	N Phone	N Mail	N Phone	N Mail	N Phone	N Mail	N	%
• Condition of Frederiksted Fisherman's ramp/pier poor								
• Condition of ramps								
• Need more boat access facilities/fueling sites	1	1		1		1		
• Need light at the Molasses Dock								
• No mooring buoys in Hull Bay/more moorings		1	1		1			
Need for recreational fishing education	**1**						**1**	**1**
• Need greater distribution of fishing regulations	1							
• Learn more about fish and fishing techniques								
• Why is license needed?								
• Congress and legislators need to be more conscious of local fishing and fishers								
• Knowledge of closed areas for fishing								
• Knowledge of catch and release rules								
Lionfish control							**0**	**0**
• Over-abundance of lionfish								
• Lionfish depleting resources								
Bait		**1**						**1**
• Availability to purchase live bait/lack of Round robbin bait		1						
• Availability of bait to catch								
Cost of fishing	**3**	**2**	**1**	**2**		**2**	**10**	**8**
• Fuel cost	2	2				2		
• Cost of recreational fishing	1		1	2				
Weather	**1**	**1**	**1**	**2**	**1**	**3**	**9**	**8**
• Bad weather/Rough sea conditions/High waves	1	1	1	2	1	3		
Environmental degradation	**3**	**2**	**4**	**1**	**2**	**1**	**13**	**11**
• Polluted waters/clean ocean/acidic ocean			1		1	1		
• Land-based pollution		1						
• Terrestrial runoff	1		1					
• Habitat destruction		1						
• Environmental impact				1				
• Keep healthy reef systems	1							
• Littering – plastic bags	1							
• Coral degradation			2					
• Commercial fishers destroy reefs					1			
Water quality at some beaches unsafe								

Issues of Concern	Primary Issue		Secondary Issue		Tertiary Issue		Total	
	N Phone	N Mail	N Phone	N Mail	N Phone	N Mail	N	%
Other	**3**	**4**	**3**	**3**	**1**	**4**	**18**	**15**
• Lack of time to fish/too much work	1	1	1	2		1		
• Someone to fish with/Friends								
• Use recreational fishing to relax and have fun						1		
• Open ocean sea conditions								
• The ability to be able to fish		1						
• Deepwater available a short distance offshore								
• Lack of equipment						1		
• Boat size (too small)		2						
• Food and drink for fishing trip				1		1		
• Jet skis are a problem/impact fishing in STJ	1		1					
• Unable to fish in BVI	1		1					
• Pristine beaches					1			
TOTAL N Reponses	**25**	**22**	**20**	**19**	**14**	**18**	**118**	**100**

[1] DFW = Division of Fish and Wildlife

Question 18 – Contact Preference

Respondents were asked to identify their preferred method of contact (telephone, mail, email/internet or in person) if they were selected to participate in a future recreational fishing survey. Response preferences to the different methods of contact were similar in both districts Table 85). Telephone was the preferred method of contact in the USVI (43%), followed by mail (35%), Email (21%) and in person (6%). Only one respondent (1% of the respondents) wished not to be contacted in the future.

Question 18. Our goal is to better understand the recreational fishing activities in the Virgin Islands and the experience and concerns of the resource users. If you were selected for a future survey to ask your opinions about your fishing experiences in order to help the Department of Planning and Natural Resources best manage our fishing resources, how would you prefer to be contacted?

1 ☐ TELEPHONE

2 ☐ MAIL

3 ☐ EMAIL/INTERNET

4 ☐ IN PERSON

Table 85. *Question 18:* Respondents' contact preferences for future surveys. Note that not all respondents provided a preference.

Contact Preference	Number and Percentage of Respondents									
	St. Thomas/St. John District				St. Croix District				USVI	
	Phone	Mail	Total	Percent	Phone	Mail	Total	Percent	N	Percent
Telephone	22	6	28	44%	30	3	33	42%	61	43%
Mail	5	16	21	33%	12	17	29	37%	50	35%
Email	4	10	14	22%	9	7	16	20%	30	21%
In Person	0	2	2	3%	5	1	6	8%	8	6%
Do Not Contact	1	0	1	2%	0	0	0	0%	1	1%
No Response	0	3	3	5%	0	6	6	8%	11	8%
Total # Respondents	31[1]	32[2]	63	110%	48[3]	31[4]	79	115%	142	114%

[1] One respondent gave two answers.

[2] Two respondents gave two answers and one gave 4 answers.

[3] Eight respondents gave two answers.

[4] Three respondents gave two answers.

Question 19 – Additional Comments

Respondents were given the opportunity to make any additional comments about recreational fishing in the Virgin Islands.

Question 19. Is there anything else you would like to say about recreational fishing in the Virgin Islands?

Following the format used in Question 17, the comments were grouped in the same 15 general categories: Marine Protected Areas, Overfishing, Need for Fisheries Management, Enforcement, Against Rules and Regulations, For Rules and Regulations, Need for Fisheries Enhancement, Need for More and Improved/Repaired Boat Access Facilities, Need for Recreational Fishing Education, Lionfish Control, Bait, Cost of Fishing, Weather, Environmental Degradation and Other. Specific comments made by respondents were listed beneath each general category.

A higher percentage of recreational fishers in both districts provided responses to Question 19 in phone surveys than mail surveys. For STT/STJ, 61% of the respondents provided responses to this question by phone vs 44% by mail and for STX, 66% of the respondents provided responses to this question by phone vs 35% by mail) (Table 86). A total of 53% of the USVI respondents provided comments. The three categories with the most comments for the USVI were For Rules and Regulations (18%), Overfishing (12%) and Need for More Improved/Repaired Boat Access Facilities (10%).

Table 86. *Question 19:* Number and percentage of boat-based recreational fishers that provided responses to Question 19 which provided additional comments about recreational fishing in the Virgin Islands.

	Number and Percent of Respondents													
	St. Thomas/St. John District				St. Croix District				USVI					
	Phone		Mail		Phone		Mail		Phone		Mail		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Respondents with comments	19	61%	14	44%	32	67%	11	35%	51	65%	25	40%	76	54%
Respondents with no comments	12	39%	18	56%	16	33%	20	65%	28	35%	38	60%	66	46%
Total	31[1]	100%	32	100%	48[2]	100%	31	100%	79	100%	63	100%	142	100%

[1] One respondent dropped out of survey after Question 9.

[2] Two respondents dropped out of survey, one after Question 12 and another after Question 14.

Table 87. *Question 19*. A summary of the additional comments about recreational fishing in the Virgin Islands from phone and mail surveys. The number in the cell denotes the number of responses pertaining to each specific comment. Topics in bold are general headings. Comments in normal type are the specific comments by fishers.

Recreational Fishing Comments	STT/STJ Phone	STT/STJ Mail	STX Phone	STX Mail	Total N	%
Marine Protected Areas	**1**	**1**	**6**		**8**	**6%**
Need "MPAs" and "no take " areas to replenish stocks		1				
Need designated fishing areas in St. John park for charter boats.	1					
Inability to fish from a boat in the EEMP but can fish from shore			1			
Too many EEMP fishing regulations for recreational fishers			1			
Too many recreational fishing restrictions around east end of St. Croix			1			
Too many area closures around BIRNM and east of St. Croix			1			
Too many fishing restrictions around Buck Island			1			
Opposed to restricted areas			1			
Overfishing	**2**	**6**	**5**	**3**	**16**	**12%**
Individual responsibility to maintain and police fishing industry		1				
Reduced fish stocks in last 20 years		1				

Recreational Fishing Comments	STT/STJ Phone	STT/STJ Mail	STX Phone	STX Mail	Total N	%
Decline in recreational catch		1				
Pot fishing and net fishing is killing the fishery		1				
More fish species are dwindling		1				
Overfishing with fish traps		1				
Recreational fishing not the cause of fish depletion				1		
Commercial fishing has depleted conch, lobster and reef fish.				1		
Trophy fish present but few in number				1		
Teach hospitality instead of fishing to avoid overfishing	1					
Fish traps catch juvenile fish; causes fish population decline	1					
Recreational fishing is not very good			1			
Lack of fish			1			
Real problem is Japanese fleets harvesting pelagics, tuna, dolphin, etc.			1			
Fish traps catch juvenile fish and deplete fish population			1			
Lack of fisheries resources			1			
Need for Fisheries Management	**1**	**4**	**4**	**2**	**11**	**9%**
Wants a fish trap permit for personal use		1				
Need commercial catch limits		1				
Regulations and enforcement needed to keep stocks sustainable		1				
No one should be allowed to use drag nets to catch fish		1				
Conflicts with gill and seine netters				1		
Ban gill and seine net fishing				1		
Fish traps are destructive	1					
Culture of harvesting juvenile fish			1			
Lack of recreational fisheries management			1			
Fish traps need monitoring			1			
Juvenile snapper sold as potfish			1			
Enforcement	**3**	**2**	**4**	**1**	**10**	**8%**

Recreational Fishing Comments	STT/STJ Phone	STT/STJ Mail	STX Phone	STX Mail	Total N	%
Need enforcement of fisheries regulations		1				
No enforcement		1				
Enforce" no parking" on boat ramp in Frederiksted				1		
Lack of enforcement	1					
Need for more enforcement presence	1		2			
Wants DEE to be more polite and professional with recreational fishers	1					
Illegal fishing-harvesting juvenile conch and lobster			1			
Security very bad; vehicle broken into twice last year			1			
Against Rules and Regulations			**3**		**3**	**2%**
Too much regulation			1			
Too much regulations on our recreational fishing			1			
Too many new regulations on recreational fishers.			1			
For Rules and Regulations	**6**	**6**	**11**		**23**	**18%**
Need fisheries regulations		1				
Need boat quotas on fish (i.e., dolphin and tuna)		1				
Adopt closed seasons, catch and size limits and species targets		1				
Revenue needed to pay for regulations and enforcement		1				
Ban harvest of herbivores and potfish		1				
Need for a recreational fishing license		1				
Need for recreational fisher reporting	1					
Need bag limits on fish	1					
Ban spearfishing	1					
Need size limits on fish	1					
Need more regulations and patrolling to prevent harvesting of juvenile fish	1					
Need for fish size and harvest limits	1					

Recreational Fishing Comments	STT/STJ Phone	STT/STJ Mail	STX Phone	STX Mail	Total N	%
Recreational license needed to regulate amount of catch			1			
Would like to see area closures			1			
VI needs a recreational license program			1			
Need some regulations for conservation			1			
No problem with sizes and seasons			1			
Reporting requirement for license wanted			1			
More area closures			1			
Need catch limits on recreational fishing			1			
Need spawning season closures			1			
Establish catch limits especially for conch			1			
Need rotational area closures			1			
Need for Fisheries Enhancement	**1**	**1**	**6**	**2**	**10**	**8%**
DFW doesn't maintain FADs		1				
Need new FADs/put back FADS/more FADs, fishing not like it used to be without FADs			5	2		
Need FADs for spearfishing	1					
Need to allow permitting of private docks for recreational fishing			1			
Need for More Improved/Repaired Boat Access Facilities	**3**	**3**	**3**	**4**	**13**	**10%**
Need more public boat access		1		1		
Government taken all dock space in Cruz Bay		1				
No place to land boat and fish after 8:00 pm.		1				
Frederiksted Fisherman's Pier needs improvements; dock cleats				1		
Need recreational fishing piers and docks				1		
Need proper lighting at public boat ramps				1		
Improve boat ramps, public access and docks	1					

Recreational Fishing Comments	STT/STJ Phone	STT/STJ Mail	STX Phone	STX Mail	Total N	%
Boat haulout facility needed In St. John	1					
Lack of shoreline access areas	1					
Upgrade the Molasses Dock facility with lighting			1			
DPNR needed to assess F'sted fisher pier/ramp situation; dangerous.			1			
Ramp conditions very bad; no lights			1			
Need For Recreational Fishing Education	**2**		**7**		**9**	**7%**
DFW should involve more recreational fishers in programs	1					
More education of youth	1					
Need copy of fishing regulations distributed during boat registration			1			
Young people need to learn to fish			1			
Need information on how, when and where to catch certain species			1			
Educate fishers to keep fisheries healthy			1			
Educate fishers to replenish resources			1			
Internet has conflicting fishing information for VI			1			
Educate fishers to not take small fish, allow them to reach maturity.			1			
Lionfish Control	**1**		**1**		**2**	**2%**
Spear lionfish and eat them	1					
Lionfish sting at Half Penny Bay			1			
Environmental Degradation	**1**		**1**		**2**	**2%**
Water quality degradation by dredging activities	1					
Address environmental issues first			1			
Other	**8**	**2**	**5**	**7**	**22**	**18%**
Rarely fish but enjoy it		1				
Recreational fishing is a great way to enjoy our islands		1				

Recreational Fishing Comments	STT/STJ Phone	STT/STJ Mail	STX Phone	STX Mail	Total N	%
It's all good				1		
Fish 95% from shore				1		
Fishing is his favorite hobby but becoming risky the VI.				1		
God bless the Virgin Islands				1		
Fishing is enjoyable/wonderful/love fishing/I live on STT because of the fishing	3			1		
Love St. Croix				1		
Very little shoreline fishing	1					
You can get fresh fish.	1					
35 years of commercial and recreational fishing experience	1					
Would like to do more recreational fishing	1					
Support the local fishermen	1					
Less fishermen in STX than other Caribbean islands.			1			
Recreational fishing is very good			1			
Establish fishing cooperative for reduced cost of fishing equipment and gasoline.			1			
Fisheries conservation working in BVI but not in USVI			1			
Integrate fisheries with tourism			1			
Need a commercial license fast				1		
Total	**29**	**25**	**56**	**19**	**129**	**100%**

Response Rate Analysis

Telephone Survey

Phone interviewers were asked to indicate the results of each of their contact attempts in a Table entitled Disposition Codes (Table 88) that was at the end of each questionnaire (Appx. VIII – X).

Table 88: Disposition Codes used by phone interviewers to record results of each contact attempt.

Result	Date of Contact(s)					
	1	2	3	4	5	6
Complete						
Partial Interview						
Language Barrier						
Call back later						
Refusal						
Busy signal						
Answering machine						
No answer						
Other						
Fax/modem lines						
Disconnected/blocked						
Changed Number						
Out of Area						
Cell phone						
No one over 18						
Business						
Not used						
Total						

The response rate of those responding to the survey regardless of boating for the telephone survey for the US Virgin Islands was 60% (STT/STJ – 64% and STX – 55%) (Table 89). Forty percent of USVI boat owners surveyed by telephone either were unable to be contacted (35%) or refused to be interviewed (5%). The refusal rate was slightly higher on STT/STJ (7%) than STX (4%), while the no contact rate was higher on STX (41%) than STT/STJ (28%). While there was a lower non-response rate on STT/TJ (36%) than STX (45%), a higher percentage of respondents on STT/STJ (43%) indicated that they did not fish than on STX (24%). Only 20% of the total sample (391 boat owners) indicated that they were recreational fishers and were willing to answer the questions on the interview form (STT/STJ – 16%, STX – 25%).

Table 89. *Telephone Survey*: The number and percentage of licensed boaters in the U.S. Virgin Islands who responded to telephone surveys. The bulleted categories show the breakdown of the main categories: **Total responding** and **Total not responding**. The percentages in each % column are the percent of the total sample size and not the percentage of the respondents in the two main categories.

Category	Telephone Survey					
	STT/STJ		STX		USVI	
	N	%	N	%	N	%
Total responding	**127**	**64%**	**108**	**55%**	**235**	**60%**
• *Recreational fisher*	32	16%	50	26%	82	21%
• *No Fishing*	83	42%	46	24%	130	33%
• *Commercial Only*	6	3%	7	4%	13	3%
• *No Boat*	6	3%	5	3%	11	3%
Total not responding	**70**	**36%**	**87**	**45%**	**157**	**40%**
• *Refusal*	14	7%	7	4%	21	5%
• *No Contact*[1]	56	28%	80	41%	136	35%
Total	**197**[2]	**100%**	**195**[3]	**100%**	**392**	**100%**

[1] See further breakdown for boat owners that could not be contacted in Table 86.
[2] There were two duplicate names on the phone list and another respondent completed a mail survey.
[3] There were four duplicate names on the phone list and another respondent completed a mail survey.

Thirty-five percent of USVI boat owners in the telephone survey could not be contacted (Table 89). A breakdown of the reasons for interviewers being unable to contact boat owners is provided in Table 90. The reason 60% of the "no contacts" were unable to be contacted was because there was no phone number listed in the database or the phone number was invalid: 40% (n=55) had phones that were 'Not in Service' or 'Disconnected', 11% (n=15) had changed their telephone number, and 9% (n=12) did not have a phone number listed in the database. These three reasons comprised 21% of the total sample. This relatively high percentage of invalid phone numbers was likely because boat owners were not asked to update their phone numbers when they re-registered their boats. Researchers often had to delve deep into the files to find a phone number and sometimes the phone number was >10 years old. With the rapid increase in the use of cell phones and the frequency with which cell phone owners terminate land lines, old phone numbers are often no longer in service.

In 26% of the cases of no contact, interviewers were only able to reach an answering machine. Six messages were left by the interviewer, but no call back was received. In 6% of the cases on STX and 4% of the total sample, the interviewer was asked to call back and the person was never available or the person said he would call back and never did. In 5% of cases of no contact or 2% of total sample, no one answered the phone, even after six attempts at different times of the day and different days of the week.

Table 90. *Telephone Survey*: Breakdown of reasons that telephone interviewers were unable to contact boat owners during telephone interviews. Note: a maximum of six attempts were made to contact boat owners.

Reasons for "No Contact"	Telephone Survey					
	STT/STJ		STX		USVI	
Call Back	0	0%	5	6%	5	4%
Busy Signal	0	0%	3	4%	3	2%
Answering Machine	18	32%	17	21%	35	26%
No Answer	4	7%	3	4%	7	5%
Invalid Phone	4	7%	8	10%	12	9%
Not in Service/Disconnected	19	34%	36	45%	55	40%
Changed Number	8	14%	7	9%	15	11%
Out of Area	1	2%	0	0%	1	1%
Too Ill to Answer	0	0%	1	1%	1	1%
Deceased	2	4%	0	0%	2	1%
Total	**56**	**100%**	**80**	**100%**	**136**	**100%**

Mail Survey

Forty percent (159 of 393) of USVI boaters that were surveyed by mail completed and returned the survey questionnaires (STT/STJ – 41%, STX – 40%) (Table 91). The percentage of undeliverable pre-letters and survey forms was higher on STT/STJ (32%) than on STX (24%). In contrast, the non-response rate was lower on STT/STJ (26%) than on STX (34%). Late returns comprised only 1% of the survey questionnaires returned. Late returns were returns received two months or more after the last mailing was sent and were not included in the analyses.

In the USVI, 58% of respondents that owned boats did not recreationally fish (84 non-fishers + 8 commercial only fishers of 159; STT/STJ - 46 of 80 and STX – 46 of 79). Just 5% (8 of 159) of respondents were commercial only fishers (2% (2 of 80) in STT/STJ and 8% (6 of 79) in STX). The percentage not responding combining both regions was higher for the mail survey (60%) (Table 91) than the telephone survey (40%) (Table 89).

Table 91. *Mail Survey*: The number and percentage of licensed boaters in the U.S. Virgin Islands who responded to mail surveys. The bulleted categories show the breakdown of the main categories: **Total responding** and **Total not responding**. The percentages in each % column are the percent of the total sample size and not the percentage of the respondents in the two main categories.

Category	Mail Survey					
	STT/STJ		STX		USVI	
	N	%	N	%	N	%
Total responding	**80**	**41%**	**79**	**40%**	**159**	**40%**
• *Recreational fisher*	32	16%	31	16%	63	16%
• *No Fishing*	44	22%	40	20%	84	21%
• *Commercial Only*	2	1%	6	3%	8	2%
• *No Boat*	2	1%	1	1%	3	1%
• *Returned questionnaire blank*	0	0%	1	1%	1	>1%
Total not responding	**117**	**59%**	**117**	**60%**	**234**	**60%**
• *Undeliverable*	64	32%	48	24%	112	28%
• *No Response*	51	26%	66	34%	117	30%
• *Late*	2	1%	3	1%	5	1%
Grand Total	**197**	**100%**	**196**	**100%**	**393**	**100%**

Table 92 summarizes the results of the various mailings that were undertaken to generate responses for the mail survey. Only 17% of postcards were returned with a request for a Spanish or English version of the questionnaire. Note that the total undeliverable (returned by the post office) addresses increased over time as various mailings were sent out.

Table 92. *Mail survey:* Final results from mailings of 1) informative pre-letters (no response requested), 2) postcards requesting return mailing and indication of whether they preferred the questionnaire in English or Spanish, 3) first mailing of survey questionnaire, 4) follow up postcards asking participants who had not returned their survey form to do so, and 5) second mailing of survey forms. Note: The number of follow up postcards and surveys mailed the second time were based on the number of surveys or postcards returned as undeliverable at the time of the follow up postcards were mailed. Subsequent to these mailings undeliverable postcards and surveys arrived and they are included in the final results provided herein.

Mail Survey						
	STT/STJ		**STX**		**USVI**	
Pre-letters mailed (Total Sample N)	***200***		***200***		***400***	
• Total Undeliverable[1]	65	33%	42	21%	107	27%
# of postcards mailed (Total sample N minus undeliverable letters)	***200***		***200***		***400***	***73%***
• Postcards returned completed	34	25%	39	25%	73	25%
• Postcards not returned	101	75%	119	75%	220	75%
# of surveys mailed[2]	***135***		***158***		***293***	
• Returned surveys	54	40%	57	36%	111	38%
• Surveys that were undeliverable[3]	54	40%	39	25%	93	32%
• Surveys not returned	27	20%	62	39%	89	30%
# of follow up postcards mailed[4]	***92***		***101***		***193***	
Follow up Post Cards Undeliverable	5	5%	6	6%	11	6%
# of surveys mailed a second time[5]	***82***		***94***		***176***	
• Surveys returned	26	32%	22	23%	48	27%
• Surveys unable to be delivered	3	4%	4	4%	7	4%
• Surveys not returned	53	65%	68	72%	121	69%

[1] Returned by US Post Office and marked as undeliverable.
[2] Total surveys mailed initially = total number in survey minus undeliverables.
[3] Includes all undeliverables received from USPO even those received after follow up postcards were mailed.
[4] Total Follow-up Post Cards Mailed = number of non-responders + undeliverables at the time of the mailing.
[5] Total number of surveys mailed a second time = number of surveys mailed minus duplicates and undeliverables.

A $2 incentive was included in approximately half of the mailed questionnaires. Individuals receiving an incentive were randomly selected from the mailing list. The incentive increased participation slightly: 57% of questionnaires were returned for mailings with the $2 incentive vs 52% for mailings with no incentive (Table 93). The effect was negligible on STT/STJ (incentive - 60% vs non-incentive - 59%). However, on STX, the response rate for fishers who received the incentive was 54% while the response rate for fishers who did not receive the incentive was 46%.

Table 93. *Mail Survey:* STT/STJ and STX mail survey incentive vs. no incentive comparison. The mail survey initially consisted of 200 boaters from each District. Ownership of more than one vessel resulted in duplicates on the list reducing the sample sizes to 198 for STT/STJ and 196 for STX. Undeliverable returns of pre-survey letters further reduced the sample size down to 135 boaters in STT/STJ and 158 boaters in STX. These numbers were equally divided to establish incentive vs. no incentive sample sizes of 68 and 67, respectively, for STT/STJ and 79 each for STX.

Mail Survey Results												
Breakdown of Results of Survey Mailings	**STT/STJ**				**STX**				**USVI**			
	Incentive		**No Incentive[1]**		**Incentive[2]**		**No Incentive**		**Incentive**		**No Incentive**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Initial Sample size	**100**		**100**		**100**		**100**		**200**		**200**	
Sample size minus duplicates and undeliverable returns of pre-survey letters	**68**	**100%**	**66**	**100%**	**79**	**100%**	**79**	**99%**	**147**	**100%**	**145**	**100%**
Total Returns	***41***	***60%***	***39***	***59%***	***43***	***54%***	***36***	***46%***	***84***	***57%***	***75***	***52%***
Return-Complete	15	22%	17	26%	19	24%	12	15%	34	23%	29	20%
Return-No Fishing	25	37%	19	29%	19	24%	21	27%	44	30%	40	28%
Return- Commercial Only	0	0%	2	3%	3	4%	3	4%	3	2%	5	3%
Return-No Response	0	0%	0	0%	1	1%	0	0%	1	1%	0	0%
Return-No Boat	1	1%	1	2%	1	1%	0	0%	2	1%	1	1%
Total No Returns	***27***	***40%***	***27***	***69%***	***36***	***46%***	***43***	***54%***	***63***	***43%***	***70***	***48%***
No Response	15	22%	17	26%	27	34%	34	42%	42	29%	51	35%
Undeliverable (excluding undeliverables from the initial mailing)	10	15%	10	15%	8	10%	8	10%	18	12%	18	12%
Late	2	3%	0	0%	1	1%	1	1%	3	2%	1	1%
Undeliverable Breakdown	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
-Attempted/Not Known	3	30%	5	50%	1	13%	5	63%	4	22%	10	56%
-Unclaimed	2	20%	2	20%	0	0%	1	13%	2	11%	3	17%
-Not Deliverable as Addressed	0	0%	1	10%	0	0%	0	0%	0	0%	1	6%
-No Mail Receptacle	1	10%	0	0%	1	13%	1	13%	2	11%	1	6%
-Insufficient Address	2	20%	1	10%	0	0%	0	0%	2	11%	1	6%

Mail Survey Results												
Breakdown of Results of Survey Mailings	**STT/STJ**				**STX**				**USVI**			
	Incentive		**No Incentive[1]**		**Incentive[2]**		**No Incentive**		**Incentive**		**No Incentive**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
-No Such Number	0	0%	0	0%	1	13%	1	13%	1	6%	1	6%
-Unable to Forward	2	20%	1	10%	4	50%	0	0%	6	33%	1	6%
-Deceased	0	0%	0	0%	1	13%	0	0%	1	6%	0	0%
Total	10	100%	10	100%	8	100%	8	100%	18	100%	18	100%

[1] STT/STJ Mail No Incentive - Sample number reduced from 67 to 66 due to one duplicate mailing.
[2] STX Mail Incentive - Survey included one mailing to a boater who had completed a phone survey interview.

Discussion

The goal of this pilot project was to determine if the annual vessel registration list maintained by the Government of the USVI, Division of Environmental Enforcement (DEE), could be used as a frame to characterize boat-based recreational fishing. To accomplish this goal, a survey questionnaire was developed to collect basic information on recreational fishers and their fishing effort. Pilot telephone and mail surveys were conducted of boat-based recreational fishers to identify if either method was viable and which was the preferable method for conducting continuous MRIP sampling in the U.S. Virgin Islands.

Division of Environmental Enforcement Boater Registration Database

A total of 4,689 vessels were registered in the DEE boater registration database for 2013; 3,448 vessels in STT/STJ (74%) and 1,241 vessels in STX (26%). Obtaining accurate, up to date information from boater registration files was difficult. Considerable time was spent verifying boater addresses and phone numbers in the electronic database with hardcopy files due to database entry errors, missing information or dated information. Vessels in the electronic database that were not found in hardcopy files were unable to be verified by QA/QC checks and subsequently deleted from the dataset. If MRIP determines that the boat registration database will be used for surveying boat-based recreational fishers, it is critical that a high priority be placed on annually updating contact information and timely data entry.

Individuals hired through the Department of Labor Summer Youth Program are routinely used to enter data and maintain hardcopy files. Lack of familiarity with vessels, registrants and data entry may create additional errors in the database. Applicants may not fill out renewal forms in their entirety, particularly if they are registering several vessels. This results in essential information missing, such as updated contact information (registrant name, mailing address and phone number). Because vessels change ownership, registrant files are kept by vessel registration number. Lack of complete vessel registration information requires an extensive file search to piece together the missing information. Many registrant phone numbers have changed over the years; land lines have been dropped and replaced by cell phone numbers. If a phone number has not been updated for several years, it is likely that the phone number is no longer valid. Email addresses are not recorded on the registration form. Registration hardcopies completed during the registration process may not be filed for extended periods. Should DEE need to contact registered boaters to disseminate information, it would be a very difficult task.

NOAA Highly Migratory Species (HMS) and National Saltwater Angler Registry (NSAR) Databases

Vessels targeting HMS species (tuna, shark, swordfish and billfish) in federal waters (>3 nm from shore in USVI/9 nm from shore in Puerto Rico) are required to register vessels under the HMS permit system. Recreational anglers fishing in federal waters who do not possess a license from one of the 49 states with federally recognized licenses (excludes Hawaii), or an HMS or For-Hire federal permit, are required to register with NOAA under the NSAR permit system. Anglers on Charter/Headboat or For-Hire permitted vessels are not required to register

individually with HMS or NSAR. Under the NSAR and State Exemption Program in 2012 (Federal Register Volume 77, Number 138, pp.42189-42192), final rule was amended that made the USVI and PR potentially eligible individually for Exempted State status based on the regional survey option. For a state, territory or commonwealth to receive exempted status, the region must collect information on For-Hire vessels and vessel registrations (recreational license program or qualifying survey) and provide the same to NSAR annually. Prior to the 2012 amendment, the Caribbean was identified as a single region, requiring PR and USVI to have a unified qualifying survey to be eligible for exempted status. The amendment designated USVI and PR as separate regions under the rule enabling both to individually be exempted when a qualifying survey was implemented (G. Colvin, NOAA Affiliate, pers. com.).

USVI compliance with these federal permits varied considerably. Table 4 compares the home port of registrants listed in the USVI DPNR Division of Environmental Enforcement (DEE) boater registration database with individual anglers and vessels registered to fish in the US Caribbean Exclusive Economic Zone (EEZ) in the HMS and NSAR databases. Sixty percent of the fishers that registered in the HMS database in 2013 also registered their boats in the USVI (Table 94). In contrast only 6 (less than one percent) of USVI registered boaters registered in the NSAR database. Forty percent of the Virgin Islands HMS registrants had not registered their boats in the Virgin Islands. Only 1% of the individuals in the Virgin Islands database obtained NSAR permits (Table 94). A significant number of stateside residents were registered through HMS and NSAR to fish in the USVI (15 and 826 (820 individual and 6 For-Hire vessels), respectively), but it is not known if they did. The HMS Division requires reporting for HMS recreational tournaments (tuna, billfish, shark and swordfish), any recreational catch of Atlantic Bluefin tuna, Blue and White marlin, Sailfish and Swordfish and by HMS dealers.

The stateside residents (HMS – 15, NSAR – 826) and those registered from Puerto Rico (HMS - 3, NSAR – 192, including 10 NSAR registered For-Hire vessels) represent an important component of the recreational fishing sector that has not been surveyed. The registered Puerto Rico fishers are particularly important for obtaining recreational fishing data for St. Thomas/St. John. During holidays, locals refer to the stream of boats arriving from Puerto Rico as the Puerto Rican navy. Many of these vessels may recreationally fish in the Virgin Islands' waters off St. Thomas and St. John. Non-resident and transient vessels seasonally fishing in the USVI are believed to comprise a significant portion of the recreational fishing effort.

There were approximately 2.7 million visitors to the USVI in 2013 (Bureau of Economic Research; www.usviber.org). The vast majority of these visitors arrive by cruise ship, visiting the islands only for a day. A smaller but significant number arrive by airplane and stay in hotels. It is unknown how many of these visitors fish in USVI waters. Surveys of charter boat operators would provide information on recreational fishing by visitors who charter vessels. Similarly, surveys of rental boat operators may be able to provide information on the number of visitors who rent boats and request fishing equipment. These would need to be targeted surveys since the numbers of companies that charter vessels and rent boats is not large.

Table 94. A comparison of the home port of registrants in USVI boat registration database with registrants in the federal US Caribbean HMS and NSAR databases.

Registrants	Registrants in USVI Database		Registrants in HMS Database		USVI Boat Registrants in HMS Database		Registrants in NSAR Database		USVI Boat Registrants in NSAR Database		USVI Boat Registrants in NSAR & HMS Database[4]	
	N	%	N	%	N	%	N	%	N	%	N	%
USVI	3,177	99.4%	59	73%	49	60%	15[1]	1%	6	1%	2	0.2%
Stateside	1	0.03%	15	19%	0		826[2]	80%	0		0	
Puerto Rico	7	0.2%	3	4%	0		192[3]	19%	0		0	
British Virgin Islands	9	0.3%	4	5%	0		0	0%	0		0	
Total	3,194	100%	81	100%	81		1,033[5]	100%	1033		1,114	

[1] Two duplicate registrants found for USVI.
[2] Includes 820 individual registrants and 6 For-Hire vessels.
[3] Includes 182 individual registrants and 10 For-Hire vessels.
[4] Recreational fishers are not required to register with NSAR if they register with HMS.
[5] NSAR database includes 1017 individual registrants and 16 For-Hire vessels.

Sampling of Boaters

The initial sample size was 800, with 200 individuals sampled in each district and with each survey type (telephone and mail). However, the sample size was reduced to 769 for several reasons:

- Some registered boaters owned more than one boat and were listed more than once on the mail or phone list of boaters to be sampled;
- Some registered boaters were on both the mail and phone list and only responded to the mail survey. This duplication of names was not detected prior to the commencement of the surveys;
- Eight registered boat owners surveyed in the summer of 2014 in each district (4%) said that they had not owned a boat in 2013.

Table 2 provides a breakdown of the reduction in sample size for the above reasons. Only 376 of the 769 individuals in the final sample responded to the survey. This was 49% of the final sample size (769) or 47% of the original sample size of 800. Because of the small sample size of respondents that recreationally fished in the pilot telephone and mail surveys, the results should not be extrapolated to the entire population of registered boaters in the USVI.

A further breakdown is provided in Table 95, which is a detailed analysis of the responses to the telephone and mail survey using the AAPOR Outcome Rate Calculator.

The AAPOR Response Rate Calculator uses standard formulas accepted by the Council of American Survey Research Organizations to calculate response rates across various survey designs. Researchers are encouraged to use the Response Rate Calculator in their survey reports; however, AAPOR reports the relationship between response rates and survey quality (nonresponse bias) is unclear. Response rates are identified as the number of eligible sample units (respondents) that cooperate in a survey. The percentage of registered boat owners responding to the telephone and mail surveys in 2013 regardless of whether they recreationally fished or owned a boat in 2013 was 77.9% and 40.2%, respectively (Response Rate 2). The percentage responding to the telephone and mail surveys that recreationally fished was 27.1% and 16.0%, respectively (Response Rate 1) (Appx. XI).

The response rate target of 20% was exceeded with 60% of individuals responding in the telephone survey (STT/STJ – 64%, STX – 55%) and 40% responding in the mail surveys (STT/STJ – 41% and STX 40%) (Table 89). However, because a high proportion of the respondents did not fish, the response rate for the questions on fishing details in the questionnaire was much lower, 21% for telephone surveys (Table 89) and 16% for mail surveys (Table 91). There was a higher proportion of individuals on STX than on STT/STJ who were interviewed by telephone who recreationally fished and agreed to answer the questions (26% and 16%, respectively) (Table 89), while more individuals recreationally fished and completed the mail survey on STT/STJ (24%) (32/134) than on STX (20%) (31/158) (Table 93).

The USVI mail surveys that included a $2.00 incentive had a slightly higher response rate (58% returned) than the mail surveys without the $2.00 incentive (52% returned). The response rate

on STT/STJ was almost the same with (60%) and without (59%) the incentive, while the response rate was higher on STX with the incentive (54%) vs without (46%). The mail surveys had a higher no contact rate with 60% of mailings not returned (24%), undeliverable (35%) or returned too late to be included in the database (1%). Only 40% of individuals in the telephone survey were unable to be contacted (35%) or refused to do the survey (5%).

The telephone surveys were more successful than the mail surveys in obtaining complete or partial interviews. Contact information on file appeared to be better for the telephone than the mail survey. There was a higher overall response rate for telephone interviews compared with mail surveys (60% for phone surveys vs 40% for mail surveys) (Table 92).

There could be a number of reasons for the response rate differences due to possible introduced nonresponse bias. Six attempts were made by phone interviewers to contact boaters at different times of the day, different days of the week and on weekends vs. two mail attempts. Boaters could still be contacted by phone, even if they were off-island during survey period, provided that cell phone numbers were recorded. Resident boaters who were off-island during the survey period (summer months) and "snowbirds" only present during the winter months in some cases had local addresses. Mail surveys sent to the local addresses of "snowbirds" may not have been forwarded or they may not have received the questionnaire and/or been available to respond to the survey in a timely manner. Also, mail survey returns were slow. The collection period was continued for four months instead of two. For example, the effectiveness of the thank you reminder depends strongly on arriving shortly after the original request. This mailing was delayed in the current study. The timing of the combined effects of multiple contacts is central to gain the most powerful impact (Dillman et.al. 2014). The effect of extending the response time beyond two months for this survey is not known; however, in the future, mail surveys should be conducted within the time frame recommended in the survey literature to improve response. This could be done if all elements of the survey including questionnaires, signed letters, incentives, and postcards were prepared before the start of the survey.

Phone survey interviewers were able to elicit more complete responses from interviewees for some of the questions. For example:

- Question 7: The proportion of fishers that provided a percentage of household food from the sea was lower in mail surveys than in phone interviews on STX (72% vs 98%) and STT (81% vs 97%) (Tables 10 – 12).
- Question 16: The number of fish targeted in some families was higher in phone surveys than mail surveys (see Tables 56, 64, 67, 69, 70, 72, 73).
- Question 17: Only 63% of respondents who were recreational fishers provided responses in mail surveys vs. 84% who provided responses in telephone interviews (Table 78).
- Question 17: Also, the number of issues listed by fishers on STX was higher in phone interviews (82) vs. mail surveys (38). This is in part a function of the number of respondents but the percent difference is greater than the percent difference in numbers of respondents (on STX there were 37% fewer responses vs 21% fewer respondents). On STT/STJ mail surveys and telephone interviews elicited the same number of responses (59 phone and 59 mail).

- Question 18: Telephone interviews were the preferred method of contact in future surveys, though only 42% preferred this method (Table 81).
- Question 19: Only 40% of boat-based recreational fishers provided additional comments in the mail surveys vs. 64% in the telephone interviews (Table 82). Similarly the number of issues raised was higher in telephone interviews (85) than in mail surveys (44).

Recommendations:

1. The telephone surveys were more successful than the mail surveys in obtaining complete or partial interviews and should be considered for an MRIP operational survey in the USVI. The pilot telephone survey was approximately 15% more expensive that the pilot mail survey. The higher cost of the telephone survey was due to cost of paying the telephone interviewers. The cost is more than offset by the 20% higher success rate of the telephone vs. the mail surveys.

2. For an operational recreational fishing survey program, the sample size should be increased because only 17% of individuals of the initial sample size of 800 (Table 95) or 19% of the modified sample size of 769 responded and recreationally fished (Table 2). The assumption was that 20% of the 800 people surveyed (400 per district) or 160 people would be recreational fishers and complete the questionnaire. It should also be increased to take into account that not all respondents answer every question. If a telephone only survey is done, then the percentage of respondents recreationally fishing would likely increase, since there was a 21% response rate from the telephone surveys. Also, it is highly likely that recreational fishing and catches differ substantially on sailboats vs power boats. Therefore, stratification should be used to ensure that the sample size is adequate for at least the two boat types that are commonly used for recreational fishing in the USVI, sail boats and power boats.

3. Of the two survey methods used in this pilot study, telephone interviews are the preferred survey method because the respondents indicated that they preferred this method, the response rate was higher, and more complete responses were elicited. The telephone survey was completed in a timelier manner than the mail survey, which required several follow-up mailings to try to increase the response rate. Delays in the mail survey were experienced due to difficulties in acquiring accompanying approved and signed letters, obtaining $2.00 bill incentives locally from banks and acquiring the needed mailing supplies at the main postal center on St. Croix. The mail survey was continued for four months instead of the optimal two months, the latter time period maximizes the response rate. Also, with mailings, few contacts responded to the postcard asking whether they wanted the survey in Spanish or English. As a result, boat owners with Spanish surnames were mailed both an English and a Spanish copy of the survey form. Some Spanish-speaking-only anglers may have only received an English questionnaire and not responded. Both interviewers in the telephone survey were fluent in English and Spanish. Approximately 5% (approximately 12 interviews) of the 235 telephone interviews (Table 89) were conducted in Spanish for all or part of the survey.

Relatively few commercial fishers were interviewed in this survey. Only 28 of the respondents were commercial fishers (Table 6). This is 4% of the modified sample size and only about 9% of the 297 licensed commercial fishers in the USVI that had registered by March 18, 2011 for the 2010-11 fishing year which runs from July 1st to 30 June (Kojis and Quinn, 2011). Only 11 commercial fishers (39%) recreationally fished (Table 6). Those that did recreationally fish were asked if they reported their recreationally caught catches on their Commercial Catch Report Forms. Six of the seven (85%) who responded to this question said that they did (Table 7). Commercial fishers take family and friends fishing sometimes and, if the catch is large and/or includes species with high market value such as dolphinfish, tunas, and wahoo, they likely would sell a portion of the catch in excess of their needs. Also, only three charter fishers were surveyed on each island. This is a relatively small but important group of recreational fishers in the US Virgin Islands.

Recommendations:

1. Commercial fishers should be surveyed separately preferably when they annually register for their commercial license. The survey should be limited to finding out how many commercial fishers recreationally fish, how often they recreationally fish, if they record their recreational catch on their CCRs, and if they sometimes sell recreationally caught fish. If a large proportion of commercial fishers report recreationally fishing and do so frequently without selling the fish and not traditionally reporting it on their CCRs, then it needs to be determined if they need to be included in recreational fishing surveys.

2. Because there are only a small number of local and transient charter fishers, 100% of these groups should be surveyed. Charter boats are considered a separate stratum in other state surveys.

Table 95. Comparison of the response rates of **boat registrants and boat-based recreational fishers** in the U.S. Virgin Islands to telephone and mail surveys.

	STT/STJ				STX				USVI					
	Phone		Mail		Phone		Mail		Phone		Mail		Total	Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Sample size	191		195		189		194		380		389		769	
# and % of boat owners responding to survey	120	63%	78	40%	104	55%	74	38%	224	59%	152	39%	376	49%
# and % respondents who were recreational fishers	32	17%	32	16%	50	26%	31	16%	82	22%	63	16%	145	19%

Boat Usage by Ownership Type (Q5)

Most recreational fishers use a boat they own to recreationally fish even if the boat is used commercially in the charter or commercial fishing industry. Ninety-five percent of fishers on STT/STJ and STX said they use their own boat (Tables 8 & 9). Three recreational fishers on STT/STJ used a commercial fishing boat (5%) and four (6%) used their own charter sportfishing boat 'always' or 'usually' (Table 8). Only four fishers said they hired a charter boat and this was only 'usually' or 'sometimes' and only two (3%) used a rental boat with or without a captain. Thirty-eight percent of respondents on STT/STJ used a boat owned by friends or family when their own boat was not used. The breakdown on STX is similar with 22 (28%) of respondents using a friends or family boat when their own boat was not used, six (8%) respondents 'always' using their commercial boat to recreationally fish, five (6%) respondents 'sometimes' hiring a charter boat, two (3%) respondents 'always' or 'usually' using their own charter boat, and two (3%) respondents using a rental boat 'always' or 'usually' (Table 9).

Recommendations: Rental and charter boat operations need to be targeted separately to achieve an adequate sample size. Charter boats are considered a separate stratum in other state surveys. The number of USVI-based rental and charter operations is small and we recommend 100% sampling of this category. Also, the number of transient sportfish vessels that participate in marlin tournaments in the USVI is reasonably small and we recommend 100% sampling of this category as well. It is likely the transient vessels participate in tournaments, and, therefore, could be contacted through the local game fishing clubs, though this would need to be verified.

Some commercial fishers also fish recreationally. The Virgin Islands has a small scale commercial fishery and the line between recreational fishing and commercial fishing is blurred. Commercial fishers will likely sell at least part of their 'recreational' catch, if they catch enough and there is a market for the species. All but one commercial fisher who recreationally fished, reported their recreational catch on the CCR forms. Commercial fishers could be required to separately report all recreational and commercial catches on their CCRs. However, this will increase the reporting burden for commercial fishers and would probably not be realistic. If implemented, the term "recreational catch" would need to be defined and commercial fishers educated in how to fill out the new catch forms accurately. However, it is assumed that there is little verification of actual catch with catch reported on the CCRs. Requiring commercial fishers to separately report recreational and commercial catch would make it more difficult for them to accurately report their catch and result in an increase in fishers misreporting their catch. Also, before any implementation of a separate recreational and commercial catch reporting requirement, there should be extensive discussion regarding the impact of this additional reporting burden with commercial fishers and the Southeast Fisheries Science Center. The latter has the responsibility of modifying the forms, educating fishers, verifying the accuracy of the reporting, and inputting and verifying the data.

Since the ultimate goal is to manage a species irrespective of whether it is recreationally caught or commercially caught, it is recommended that a survey of 100% of commercial fishers be conducted to determine the frequency of recreational fishing among commercial fishers and if they record their recreational catches on their CCRs. This would provide a basis for determining

if the catch report forms need to be changed to take into account commercial fishers' recreational catches. We recommend that the forms not be modified, if only a few commercial fishers recreationally fish, do so infrequently, sell fish from recreational catches if in excess of their home needs, and/or usually report their recreational catch on their CCRs.

Although in-person surveys were not rated highly, a simple survey to determine if changes in the CCRs are warranted could be conducted by DFW during commercial fisher registration in July. The questions in this survey of commercial fishers should include:

Do you recreationally fish? Yes No
How many times per month or year do you recreationally fish? _____ Month or _____ Year
How many lbs of fish do you catch on average during each fishing trip? _____ lbs
Do you ever sell your recreationally caught fish? Yes No
Do you report your recreationally caught fish on your catch reports? Yes No
Would you be willing to complete an additional survey on the fish you catch recreationally? Yes No

Motivation for Recreationally Fishing (Q6)

The primary reasons for recreationally fishing were similar on STT/STJ and STX (Tables 10 & 11): 1) for food (STT/STJ - 75%, STX – 72%), 2) to have fun and relax (STT/STJ - 68%, STX – 59%), 3) to spend time with friends and family (49%, STX – 43%) and 4) for sport (STT/STJ and STX - 44%). Three fishers on STX and one on STT/STJ said that their primary or secondary motivation was to make money. The fisher on STT/STJ owned a charter sailing vessel and two of the three fishers on STX were commercial fishers who recreationally fished.

Recommendation: This question could be omitted from future surveys unless it seems likely that the motivation for recreationally fishing is changing.

Percent Household's Food Consumption from Recreational Fishing (Q7)

Eating fresh, locally caught seafood is part of the cultural tradition in the USVI. Family beach camping is very popular on STX over extended holidays, during which time individuals in boats gather food from the sea. Forty-three percent of respondents reported that they subsistence fish (Table 6) and 75% of respondents on STT/STJ and 72% on STX said that one of the main reasons they recreationally fish is for food (Table 10). The mean percentage of household food from the sea consumed monthly in the USVI was 8.9% (median – 4%; mode – 3%; Table 12). Visitors chartering a boat to fish in the USVI typically do not have the ability to keep large quantities of fish that they may catch. The catch is usually kept by the charter boat operator to offset trip costs and pay crew and only a portion of the catch (enough for a meal or two) given to the anglers who chartered the boat (W. Tobias, pers. obs.). Some charter vessel operators also have commercial licenses which affords them the ability to sell their catch (W. Tobias, pers. obs).

Recommendation: The percent household's food consumption from recreational fishing would be directly related to the success of the angler's fishing effort. Some anglers found this question

difficult to interpret. Unless specific socio-economic information is desired, this question could be omitted or modified in future surveys.

Type and Length of Boat Most Often Used for Recreational, Subsistence or Charter Fishing (Q8)

Power boats with a mean length of 21.4 ft (Tables 15-18) are the primary boats used by 81% of the recreational fishers in the USVI. Power boats were larger in size in STT/STJ than in STX. Sailboats were used less frequently but were larger in size (mean length – 39.3 ft). Power boats allow recreational fishers to pursue or chase fast moving schools of fish or cover great distances in pursuit of fish. Recreational fishers with sailboats fish in a more relaxed mode, due to the slower speed of the vessel, and typically fish secondarily to sailing.

Tobias and Dupigney (2009) found that the average size vessel in the USVI used to fish for billfish and pelagic species was 28 ft (50% of vessels were within the size range 28-39 ft). Similarly, larger vessels were used in STT than in STX. They reported that the size difference may be directly related to the distance required to travel to reach fishable waters; the shorter distance for STX allowing smaller vessels to participate in the fishery. The smaller vessels are also more easily trailerable. Topographically, STX is less hilly than STT/STJ, which allows for trailering and launching of vessels at boat access facilities and storage of the vessels at home. The hillier STT/STJ has more protected waters, sheltered bays and marina facilities for mooring or docking recreational vessels.

The boat most often used by recreational fishers in the USVI was their own (95%, Tables 19 - 21). Recreational fishing charter vessels on STX are owner operated but in STT/STJ owners hire captains and crew to manage and operate their charter vessels, which are larger in size than STX (Tobias and Dupigney 2009).

Recommendation: Limit the information requested in an operational program to only the boat most often used for recreational fishing.

Where Do You Recreationally Fish Using the Boats You Own? Q9

Both the territorial and federal government have great interest in knowing whether recreational fishing effort is occurring in waters under their respective jurisdiction (territorial waters < 3 nm) or federal waters >3 nm). The larger recreational fishing vessels that frequent offshore waters are well equipped with an array of electronics including a global positioning system (GPS) to determine their exact location. Small, portable and relatively inexpensive GPS handheld units are carried on many smaller powerboats; however, vessels are not required by the U.S. Coast Guard to have one onboard. Many recreational fishers still estimate distances by line of sight or bathymetric features and use triangulation with objects on land to locate fishing hotspots. Recreational fishers were not asked if they have a GPS unit onboard in this survey and reference was made to miles from shore not nautical miles.

More fishers in the USVI **only** fished <3 miles from shore (45%) than **only** > 3 miles from shore (15%) and 39% fished < > 3 miles from shore Table 22). When numbers of recreational fishers

that fished both less than and greater than three miles from shore were combined with the less than category and greater than category, the difference between categories increased significantly (85% < 3 miles vs. 55% > 3 miles) (Table 27). Because of the close proximity to very deep water off the north, south and west coasts, recreational fishers fishing <3 miles from shore from STX could fish for everything from demersal species (conch, lobster and reef fish) to billfish (swordfish, marlin) and pelagic species (tuna, dolphin and wahoo). With the right sea conditions, a small outboard-powered boat provides a suitable fishing platform.

A larger and deeper shelf platform surrounds STT/STJ (0 – 100 fm depth = 510 nm^2, 43% in EEZ) (Tobias 2009), providing more habitat for demersal and inshore species but requiring recreational fishers to travel at least eight miles offshore to fish for billfish and pelagics, which is typically accomplished in a larger vessel. This may be the reason why recreational fishers who fished both <> 3 miles from shore in STT/STJ spent more time fishing < 3 miles from shore than > 3 miles from shore (57% vs. 43%). Conversely, STX recreational fishers who fished both <> 3 miles from shore spent more time fishing > 3 miles from shore than < 3 miles from shore (57% vs. 43%). Fishing pressure on the STX shelf may be greater than on the STT/STJ shelf (STX - 12,714 commercial trips vs. STT/STJ - 5,081 commercial trips in 2006-2007) (Tobias 2009) and reef fish resources less abundant because the total shelf platform is significantly smaller (at 0 – 100m depth = 120 nm^2, 18% in EEZ), the shelf shallower, and the diversity of gear, such as spearfishing by snorkeling and scuba, greater than STT/STJ. Increased fishing pressure on in-shore demersal resources can adversely affect resource population numbers. Recreational fishers seeking higher catch rates may choose to fish for reef fish resources more than three miles offshore to the east on Lang Bank or pursue seasonally abundant pelagic resources (tuna, dolphin, wahoo, billfish) further offshore.

Recommendations: The Virgin Islands Commercial Catch Reports (CCR's) includes a biological grid map for fishers to identify where they conduct their fishing effort. A similar map could be incorporated in an operational program for respondents to indicate where they fish. However, this information would not be possible to collect in a telephone survey but would be possible in a separate mailing or during an in person survey (i.e. during boater registration). Fishers may be reluctant to identify their fishing hotspots, particularly if they are charter boat operators and their livelihood depends on their ability to consistently produce catch for their clients. Individuals may be reluctant to complete a survey if specific fishing location is required. The required preciseness of fishing location needs to be determined by the respective territorial and federal agencies responsible for fisheries management in those jurisdictions. Does the importance of obtaining more accurate fishing location data trump the efficiency of a telephone survey? If no further accuracy than determining if the fishing effort is conducted in territorial vs. federal waters is required, the question should remain as is.

Where Do You Land Your Fish When You Return To Shore With Your Boat? Q10

Information on where recreational fishers land their catch is an important parameter to maximize effort for a boat-based recreational fisher intercept survey. Results from this pilot study identified that boat ramps and marinas are the two most important landing sites in the USVI (62% and 21%, respectively) (Table 26). Government boat ramps were more frequently used by

recreational fishers in STX (72%) than STT/STJ (50%) due to the differences in topography among islands.

STX has a mobile recreational fishing fleet identified by the use of multiple ramp facilities by individual boat owners compared to boat owners on STT/STJ who use only one facility each (Table 27). The relatively flat topography and good roads on STX enable recreational boat-based fishers to trailer their boat to one of three boat access facilities around the island, depending on sea conditions and availability of fisheries resources.

Public boat access facilities are used by recreational and commercial fishers on a "first come-first serve" basis and are extremely important to both fisheries. In many instances, it is the condition of these facilities that initiates either a good boating/fishing experience or a bad one for the day. Routine maintenance and repair is essential, particularly for those facilities subject to wave assault from hurricane and storm conditions.

Four recreational fishers on STT/STJ used non-local government improved boat ramps (Tables 26 & 28). The non-local government ramps on STT/STJ were private boat ramps (Coral World and Lovango Cay), a federal government ramp, and the beach at Magen's Bay. Mooring of boats and use of the beach for hauling out boats is discouraged at Magen's Bay because it is a major destination for tourists, especially cruise boat visitors, and for locals, particularly on the weekends.

Five respondents on STX used unimproved boat ramps (Tables 26 & 28), indicating the need for additional ramp facilities in STX. Unimproved boat ramps are commonly on private property in which the owners allow individuals to launch vessels from the site and do not restrict access but do not want the site developed further. Identifying suitable sites for boat ramps in the Virgin Islands that have protected, stable shorelines, afford easy access to offshore waters and are properties owned by the government or that which may be purchased from private individuals is problematic.

Private marinas were equally popular fish landing sites for recreational boat-based fishers in both districts (Tables 30 & 31). The most popular on STT/STJ were American Yacht Harbor and Compass Point Marina (Table 30) and Green Cay Marina and St. Croix Marine on STX (Table 31). More recreational fishers used public or private docks on STT/STJ (Table 32) than STX (Table 33).

Recommendations: Boat ramps and marinas have been identified as the two most important sites for boat-based recreational fishers to land their catch. A number of unimproved access areas used by recreational fishers have also been identified. This information may be utilized in an operational program to spatially weight the amount of port sampling effort that should be conducted at each site. Port sampling effort may be optimized by concentrating on the sites identified in the pilot study.

Return Time from Fishing Q11

Fisher intercept surveys are based on primary sampling units, such as days of the week, and secondary sampling units, such as sampling sites and time intervals (Goedeke and Edwards 2013). Typically sampling sites and time intervals are weighted to increase sampling efficiency and to reflect expected fishing pressure, or in this case return time by boat-based recreational fishers. Fishers identified their landing times in 3-hour intervals starting at 12:00 am. Boat-based recreational fishers in this pilot study in both STT/STJ and STX reported most frequently landing their catch between 9:00 am and 9:00 pm with 87% of fishers landing their catch in this time period on STT/STJ and 83% on STX. Fishers on STT/STJ and STX landed their fish most frequently between 3:00 – 6:00 pm (38%) (Table 36) and 24% (Table 37), respectively. Twenty-three percent of STX fishers reported that they landed fish between 12:00 – 3:00 pm (Table 37). Only 5% of fishers reported landing fish between the hours of 9:00 pm and 6:00 am, while 13% of STX fishers reported landing fish during the same time period.

Although peak sampling times from this pilot survey would be heavily weighted between the hours of 9:00 am and 9:00 pm, additional survey time would have to be allotted to cover the very early and very late periods to capture sampling of a recreational nocturnal fishery for snapper species that might otherwise be missed (W. Tobias, pers. obs.).

Identifying the time anglers return to shore is important in weighting and maximizing shore based sampling of the boat based fishery. Omitted from this survey was an important question about what days of the week recreational fishers' fish. It is anticipated that the majority of this effort would have occurred on weekends and holidays; however, this can only be accurately determined by survey. As a primary unit for intercept sampling, information on days of the week fished should be included in the next MRIP survey.

Recommendations: Information obtained in this pilot study has identified the time that most recreational fishers return to shore from fishing. This question should be used in an operational program. The information from this question should be used to temporally stratify sampling effort in an operational program that includes port sampling.

Fishing Effort (Q12, Q13)

Boat-based recreational fishers in the USVI fished an average of 4.4 hrs per trip (Table 38) and made and average of 3.3 trips per month (Table 39). On average they fished 14.5 hrs per month. STX fishers fishing trips were shorter (4.2 hrs) than STT/STJ fishers (4.7 hrs) on average. However, they fished more frequently each month (STX – 3.8 trips per month vs STT/STJ 2.7 trips per month). Fishing effort, based on number of trips and hours fished, was greater on STX (15.96 hrs per month) than STT/STJ (12.69 hrs per month). There was high variability among fishers in each district in both the hours fished and number of trips per month. The minimum time spent fishing was 0.5 hrs on STX and 1.0 hr on STT/STJ. Maximum time spent fishing was 24 hrs for both districts. The minimum number of trips per month was <1 trip per month, while the maximum was 10 trips per month in STT/STJ and 24 on STX.

Recommendation: These two questions should be included in an operational survey. If sample sizes increase, the standard deviation should decrease and more accurate data on fishing effort would be obtained. Also, the differences in fishing effort among vessel categories could be determined.

Tournaments (Q14)

There are a number of fishing tournaments in the USVI that are held throughout most of the year. There are several billfish, wahoo and dolphinfish tournaments. In some years shark fishing tournaments have been held. There are also shoreline handline tournaments for young anglers. St. Thomas is world renowned for its blue marlin fishing. Tournaments for pelagic species are held to coincide with what is thought to be peak seasonal abundance of the target species. The offshore tournaments for billfish generally require large sportfishing boats and attract locals as well as continentals and foreigners. There are also a number of tournaments organized by the local fishing communities, e.g. the Frenchtown Mother's and Father's Day Tournaments and the Northside St. Thomas Bastille Day Tournament that attract locals only. More boat-based recreational fishers reported participating in tournaments on STT/STJ (22%) than on STX (6%). However, fishers who reported participating in tournaments did so more frequently on STX (3.3 times per annum) than STT/STJ (2.6 times per annum).

The higher percentage of fishers on STT/STJ participating in tournaments is likely because of the more numerous tournaments on STT/STJ and the more broad-based local participation in the community organized tournaments, which target inshore species such as coastal pelagics. On STT/STJ, six (43%) fishers who said they participated in tournaments always used their personal boat when recreationally fishing. Their personal boat size ranged from 15 – 27 ft with a mean of 18.3 ft. Only one tournament participant (7%) indicated that he chartered a boat sometimes, while five (36%) recreationally fished using their personal boats or family and friends boats. Their boats ranged in size from 17 – 27 ft with a mean size of 21.6 ft. Two fishers (14%) reported using their commercial boats as well as personal or family and friends boats. Their boats were 22 ft in length.

The higher individual participation rate on STX than STT/STJ was because most fishers who said they participated in tournaments indicated that they had boats large enough to participate in offshore tournaments or chartered vessels. One fisher said he chartered vessels, one owned a charter vessel, and three owned larger boats (28 – 49 ft in length). One participant owned a 20 ft boat but said he always recreationally fished on a boat owned by family or friends.

Recommendation: This question should be omitted from the operational survey or only included periodically, for example five-year intervals, to see if there is any change in the participation rate. DFW participates in tournaments to collect data on the number of participants, fishing effort, and catches. This activity is funded through their USFWS Sportfish Restoration Grants and reports are written annually with a final report usually produced at five-year intervals.

What Types of Recreational Fishing Did You Use? Q15

Offshore trolling, inshore trolling and shallow bottom fishing had the highest participation rates in STT/STJ (65%, 61%, and 52%, respectively) and offshore trolling, shallow bottom fishing and inshore trolling had the highest participation rates in STX (55%, 54% and 42%, respectively). Tobias and Dupigney (2009) identified 742 vessels in the 2005-2006 DEE boater registration database (>16 ft; omitting sailboats) that potentially could fish offshore for billfish and pelagic species. Of the 646 vessel owners that were contacted by phone, 38% used their vessel for recreational fishing. Sixty percent of the vessel owners identified by Tobias and Dupigney (2009) practiced some form of catch and release fishing, releasing all or part of the catch or a particular species.

Rod and reel is the principal tackle used in offshore trolling. A combination of artificial and/or dead bait is typically pulled (trolled) at varying distances behind the boat as it moves forward, giving the artificial or dead baits the appearance of being alive. Offshore trolling is employed year-round by resident charter boat captains and transient vessels that arrive in STT/STJ for the summer billfish season. Respondents surveyed by Tobias and Dupigney (2009) fished with single-hook rigs and used four to five fishing rods. Coryphaenidae (dolphin), Scombridae (tunas and mackerel) and Istioporidae (billfishes) represent 85% of the catch of boat-based recreational fishers targeting pelagic species in the USVI (Tobias and Dupigney 2009). Fish aggregating devices (FADs) deployed in offshore waters of the USVI have been shown to be very effective in concentrating seasonally abundant pelagic fishes for harvest and are extremely popular with recreational and commercial fishers. Tuna, dolphin and wahoo are important gamefish sought after as food fish. Although federal billfish regulations prohibit the take of some species and impose size limits and no-sale provisions on others, their inherent value released alive to the recreational sport fishing industry has rendered billfish targeted in tournaments in the U.S. Virgin Islands exclusively for catch and release, unless there is a potential for a world record catch.

Inshore trolling for jacks, mackerel and barracuda occurs from a short distance from the shoreline to the shelf edge and requires less specialized tackle. Yoyo reels (handlines) as well as rod and reel tackle are used. Due to the higher incidence of ciguatera fish poisoning around STT/ STJ than STX, greater caution is taken by STT/STJ anglers in consuming king mackerel and barracuda from inshore waters. In some areas, eating these species is strictly avoided.

Shallow bottom fishing for snapper, grunt and grouper species also occurs in the same area on the shelf platform as inshore trolling; however, the vessel is typically anchored or drifting. The tackle used is similar to that used for inshore trolling. Live or dead bait may be used on multiple hook rigs. Chum, a mixture of ground baitfish, sand and rice or bread, may also be used to attract fish. Large snapper species, such as Mutton snapper, Dog snapper, and Schoolmaster snapper, are generally not consumed in STT/STJ (though Mutton snapper is sometimes sold by commercial fishers on STT/STJ and consumed) due to ciguatera poisoning but eaten on STX. Visitors to STT/STJ that are recreational fishers and rent powerboats typically engage in inshore trolling, shallow bottom fishing and casting.

Cast net fishing, principally for baitfish, was very popular with the recreational fishers surveyed. Thirty-five percent of the respondents in the USVI used a cast net (STT/STJ – 41%; STX-31%). Baitfish may be used live, dead, as cut bait or ground into chum in combination with a variety of fishing types, including tuna hand-lining, shallow bottom-fishing, deep bottom-fishing (grouper and snapper), shallow drift line fishing (Yellowtail snapper and Blue runner) and buoy fishing. The proper type of bait/baitfish can greatly enhance the catch rate of a particular type of fishing.

Recommendations: Information on the types of fishing conducted is important and may show pattern shifts in fishing effort if target species abundance changes over time. Type of fishing and frequency (number of times per year) the fishing type is used should be obtained. Trends in fishing effort may be slow to occur. As a result, the interval for resurvey of this question may be once every three to five years. Additional surveys targeting specific types of fishing user groups can be conducted once a database of anglers is established.

What Species of Fish Do You Target and When Do You Fish For Them? Q16

Fish species targeted by recreational boat-based fishers were reflective of the types of fishing with the highest participation rates. Fishing effort was identified as the number of fishers fishing for a species in a given month. The small sample size of this pilot study precluded the ability to identify the seasonal abundance of a species or any inter-island variation in fish seasonality. Also, information from island visitors, "snow birds," who only fish when they are on-island, would have a tendency to over-weigh or skew the use of the data to determine species seasonality. Seasonality of fish species is best obtained from landings or catch data as opposed to fishing effort. It is likely that seasonality will only be able to be determined for commonly caught species. However, inexperienced fishers may state that they target a species in a particular month (and not actually catch the species in that month) without being aware that it is not within the season for the species. The purpose of collecting this information was to help identify when the appropriate interval would be to sample catch and effort for a given species in an operational survey.

Telephone surveys (CHTS) have been used in the USA mainland to obtain effort information, but mail surveys may be used next year (V. Lesser, pers. com.). Telephone surveys would likely be preferred for collecting effort data in relation to extrapolating in order to obtain the total recreational catch of species in the USVI given the higher response rate achieved in this type of survey.

Fifty-four percent of the fishers in the USVI targeted the family Scombridae (tunas and mackerel) and 37% targeted the family Coryphaenidae (Dolphinfish) (Table 96). Toller et al. (2005) and Adams et al. (1996) identified dolphin and wahoo as the dominant species in offshore sportfishing tournaments. The capture size of both varied significantly among years as well as catch rates (Toller et al. 2005). In this survey, the most fishing effort for tunas, in general, and Wahoo occurred from April-August and October-July, respectively, and Dolphinfish from October-June. Increased fishing effort during this period coincides with seasonal abundances for these species reported by other researchers for the USVI. Adams et al. 1996 reported Blackfin tuna (*Thunnus atlanticus*) abundance in STX from June-October but catch rates were too low to determine seasonal abundance in STT. Yellowfin tuna (*Thunnus albacares*) season on STX

typically runs from July-March (W. Tobias pers. obs.). Both Olsen and Wood 1983 and Adams et al. 1996 identified a single peak in Wahoo abundance in the fall/winter (August-December for STX and no distinct trend for STT – Adams et al. 1996).

Olsen and Wood 1983 reported Dolphin with two seasonal peaks, a major in the spring and a minor in the fall, while Adams reported STX Dolphin abundance from January-June and in STT from April-May. The two Dolphin peaks seem to support the two stock theory of Caribbean and Atlantic populations mixing in the northeast Caribbean (Oxenford and Hunte 1986ab); however, Rivera and Appeldoorn 2000 indicated that dolphin have a more complicated stock structure.

Table 96. Number and percentage of respondents targeting families of boat-based recreationally caught fish and invertebrates in descending order. Total number of respondents is 111.

Descending frequency with which family targeted	Family		Number & percentage of respondents targeting family	
	Scientific Name	Common Name	N	%
1	Scombridae	Tuna and Mackerel	60	54%
2	Lutjanidae	Snappers	54	49%
3	Coryphaenidae	Dolphinfish	41	37%
4	Serranidae	Groupers	36	32%
5	Carangidae	Jacks	25	23%
6	Balistidae	Triggerfish	22	20%
7	Pomadaysidae	Grunts	21	19%
8	Sphyraenidae	Barracuda	12	11%
9	Palinuridae	Spiny lobster	9	8%
10	Scaridae	Parrotfish	7	6%
11	Holocentridae	Squirrelfish	6	5%
11	Sparidae	Porgies	6	5%
13	Istiophoridae	Marlin	4	4%
13	Strombidae	Queen conch	4	4%
15	Elopidae	Tarpon and Ladyfish	3	3%
15	Scorpaenidae	Lionfish	3	3%
18	Albulidae	Bonefish	2	2%
18	Belonidae	Houndfish and Gar	2	2%
18	Centropomidae	Snook	2	2%
22	Dasyatidae	Stingray	1	1%
22	Labridae	Wrasses	1	1%
22	Tegulidae	West Indian Top Shell	1	1%

Significant inshore recreational fisheries exist in the USVI targeting coral reef fish species and coastal migratory pelagics. Adams et al. 1996 identified 78 target species from 34 fish families in this fishery. Our study further verified the presence of significant fishing effort for inshore fisheries. Demersal reef fish species of the families Lutjanidae (snappers), Serranidae (groupers), Balistidae (triggerfish) and Pomadasyidae (grunts) were targeted by 48%, 32%, 20%

and 19% of the recreational boat-based fishers, respectively. Depending on the district harvested, all species are highly rated as food fish.

Lutjanids and serranids are more heavily fished in July-October and January-March, respectively. Territorial and federal regulations are in effect to protect populations of snappers and groupers. There is an annual closed season for Mutton snapper and Lane snapper in territorial waters from April through June. Vermillion, Blackfin, Black and Silk snapper have an annual closed season in federal waters from October 1-December 31. Yellowtail snapper have a size limit of 12 inches total length in federal waters. The take of Red, Black, Yellowfin and Yellowedge grouper are prohibited in federal waters from February 1-April 30. A Red hind closed season exists in federal waters from December 1-Februaary 28. Nassau grouper have been listed as an endangered species; harvest and possession are prohibited.

Carangids (jacks) and sphyraenids (barracuda) were targeted by 23% and 11% of the fishers, respectively, and are fished all year. There are no management regulations in territorial waters for fish in either family; however, annual catch limits (ACL's) exist in federal waters for jacks.

A number of other fish families/species were targeted by recreational boat-based fishers but by fewer fishers. Eight percent of the fishers reported fishing for Spiny lobster all year. Spiny lobster do not have a seasonal closure or a harvest limit but are protected by size and other harvest regulations (no take of berried females; recreational take only by hand or snare). Recreational take is permitted using either snorkel or scuba gear. Parrotfish were targeted by 6% of recreational boat-based fishers by spearfishing. Parrotfish were harvested all year. There are recreational size and harvest limits for species of parrotfish in federal waters. The size restrictions in federal waters apply to both recreationally and commercially caught fish. The size limit for all parrotfish except Redband parrotfish is a minimum total length (TL) of nine inches. For Redband parrotfish the minimum size is eight inches (TL). There is also a recreational harvest limit of two parrotfish per day. The harvest and possession of Rainbow, Blue and Midnight parrotfish is prohibited in both territorial and federal waters.

Four percent of the boat-based recreational fishers targeted the family Istiophoridae (Marlin). Marlin are typically not targeted by the resident fishing fleet in STX unless fishing in a specific marlin fishing tournament. More frequently they are caught accidentally while fishing offshore for other pelagic species (tuna, dolphin and wahoo) (W. Tobias, pers. obs.). Marlin are the target of resident charter vessels and a transient sportfishing fleet, particularly in STT/STJ, during the months of June-September. Effort is concentrated at a well-known marlin spawning ground north of St. Thomas in British Virgin Islands waters called the "North Drop" (Brandon 1989; Friedlander and Contillo 1994; Friedlander 1995; Adams et.al. 1996).

Similarly, four percent of the boat-based recreational fishers targeted the family Strombidae (Queen conch). Queen conch is a large, long-lived, marine gastropod mollusk harvested primarily for it meat, which is considered both a delicacy by tourists and staple by residents in the Caribbean. Both size (9-inch shell length or 3/8-inch lip thickness) and harvest limits (recreational - 6 conch/person/day; maximum 24/boat and commercial - 200 conch per boat) exist for recreational and commercial fishers. A seasonal closure exists in territorial and federal waters from June 1-October 31.

Tarpon (Elopeidae), Bonefish (Albulidae) and Snook (Centropomidae) were targeted by only 3%, 2% and 2%, respectively, of the fishers surveyed. These three species represent a class of exclusive inshore gamefish primarily sought after by a small inshore guide fishery that caters to tourists or shore fishers. Most likely because of limited/reduced habitat, the fishery for these species has not blossomed in the Virgin Islands as it has in Florida, Belize and other areas. Most of the anglers that fish for these species fish using fly rods, which require a high degree of skill to be successful, and, as true sportsmen, release whatever they catch. Tarpon and bonefish have received protection in territorial waters as recreational sportfish, catch and release only.

Recommendations: Information on target species and when these species are fished is important to include in an operational survey; however, two different survey designs are required to obtain this information. Target species can be identified in a phone survey but seasonality should be obtained from intercept sampling of boat-based recreational fishers. Information about the months species are fished can help identify how to weight intercept survey sampling. Species seasonality can only be determined by continuous sampling over an extended period of time (years). Logbooks were an effective method to collect catch and effort information from charter boat operators and active recreational fishers targeting pelagics (Tobias and Dupigney 2009). Implementation of a logbook program should be considered in any future surveys of charter fishers. An operational study should also include a question on catch and release fishing.

What Are the Three Most Important Issues Affecting Your Recreational Fishing Experience by Order of Priority? Q17.

St. Croix recreational fishers identified Marine Protected Areas, Overfishing and Weather as the three most important issues affecting their recreational fishing experience at nearly equal priority (13%, 12% and 12%, respectively) (Table 79). The comments on Marine Protected Areas were directed towards Buck Island Reef National Monument and the East End Marine Park and were all in opposition to the restrictions on fishing and size of the closure area. It is estimated that approximately 20% of the STX shelf platform to 100 m in depth (24 nm^2) is closed to fishing all or part of the year. The largest areas closed to fishing are the waters of Buck Island Reef National Monument (BIRNM), managed by the Department of Interior, National Park Service, and the East End Marine Park (EEMP), managed by the Government of the Virgin Islands. BIRNM, established by Presidential proclamation in 1961 to protect unique dry island habitat and associated coral reef communities, originally consisted of a 176-acre island and 674 acres of marine habitat. Located close to boat access facilities on the north coast of STX, Buck Island was a popular fishing location and afforded protection during inclement weather. Traditional fishing conducted around Buck Island included trolling for pelagic and coastal pelagic species, shallow bottom fishing, deep bottom fishing and diving for fish, conch and lobster. Fishing was permitted to continue outside the eastern half of BIRNM called the "marine garden" area. Regulations were imposed on the take of lobster and conch within monument waters (two spiny lobster and two conch/person/day). BIRNM marine habitat was expanded in 2001 by Presidential proclamation to include an additional 17,461 acres (total marine habitat = 18,135 acres). No extractive uses were permitted within the monument following the expansion in spite of bitter opposition by resident fishers.

The East End Marine Park, the first territorial marine park in the USVI, was established in 2003 to protect the largest bank barrier reef system in the Caribbean (www.nature.org). It encompasses 60 square miles of offshore coral reef and other marine habitats and includes five square miles of "no-take areas", areas closed to fishing and harvesting. Much of the protected area consists of shallow, back reef seagrass and coral habitat that once served as important juvenile nursery ground for reef fish, conch and lobster (Mateo and Tobias 2001; Mateo and Tobias 2004). Due to overfishing, the St. Croix Fisheries Advisory Committee (STX-FAC) recommended that this area be closed to all forms of take fishing with the exception of fishing from shore and cast netting for bait. Current opinions from recreational fishers are that the closed areas are too large, the closed areas should be opened to other types of fishing other than just line fishing from the shore (e.g., inshore guide fishing from boats) and better shoreline access is needed (Table 79).

Lack of fish was the most common overfishing comment made on STX. Overfishing was attributed to recreational fishers, commercial fishers and just too many fishers in general. One reference was made specifically to overfishing of reef fish. The STX shelf platform is approximately one-fifth the size of the STT/STJ shelf platform and much shallower. Spear fishing, via snorkeling or with scuba gear, is a popular method to harvest reef fish and affords an opportunity at the same time to collect conch and lobster, depending on habitat fished. STX commercial fishers made an average of 0.8 (13%) more commercial fishing trips per week than STT/STJ (STX – average of 3.4 trips per week, STT/STJ – 2.6) (Kojis and Quinn 2011). With 20% of the shelf area set aside in some form of protection, recreational and commercial fishers must compete for suitable fishing areas and fisheries resources.

The USVI lies within the trade winds zone. It is not uncommon for winds to blow a steady 15 knots most of the year. The heaviest seas, outside of periodic hurricane winds, occur during the winter months of December through March. Given the relatively small size of recreational power boats in the USVI (21.4 ft) (Table 22), weather (wind generated sea conditions) plays a major factor in the ability of local fishers to participate in recreational fishing. While STT/STJ has numerous islands affording protection from prevailing weather conditions, the waters off its north coast are exposed to the full force of the Atlantic. Sea conditions off the north shore of STT/STJ can be treacherous with large swells rolling in from Atlantic storms in the winter. Waters south of the islands are partially protected from these swells but are subject to easterly trade wind generated wave energy.

St. Croix, located in the Caribbean Sea and protected from the full force of the Atlantic by the islands of the Puerto Rico Bank, lies 40 miles south of the northern USVI. It is considered an oceanic island, surrounded by small shelf platform with adjacent waters up to 3,000 m in depth (Tobias 2009). Except for Buck Island off the north coast and a small, man-made dredge spoil island off the south coast (Ruth Island), STX lacks the protection afforded to STT/STJ by its many adjacent cays and BVI's to the east and it lies exposed to the prevailing wind and wave energy. Open ocean conditions are experienced immediately upon leaving protected harbor waters. The lack of protected waters and the small size of the recreational vessels impacts STX recreational fishers, particularly when STX fishers indicated that they spend more time fishing in federal waters > 3 miles from shore.

Overfishing (23%), Enforcement (13%) and Environmental Degradation (11%) were cited by STT/STJ fishers as the three most important issues affecting their recreational fishing experience. In spite of a larger shelf area than STX and less commercial fishing effort, respondents felt that there were too many fishers and other boats, overfishing by commercial fishers (primarily on reef fish) and overfishing of baitfish. DEE boater registration records for 2013 show that there were 3,448 vessels registered in STT/STJ, nearly three times the number registered for STX. The steep island topography is not conducive to trailering vessels from home to launching sites; however, the many natural coastline features, protected bays and coves, provide safe harbor for dockage at marinas and moorings. As a result, coastal waters are crowded with vessels. Most commercial fishing effort in STT/STJ is with fish traps (multiple wire mesh traps tied together in a line with buoys on either end) for reef fish or seine nets for coastal pelagic species (blue runner). Fish traps are non-selective and catch a variety of reef fish species, including non-target or by-catch species (MRAG Americas, Inc. 2006). Seine nets are set specifically for carangids. Skillful commercial seine net fishers have the ability to catch entire breeding schools of carangids. Both fish traps and seine nets target reef fish populations which are also sought after by recreational fishers.

The lack of enforcement of existing fisheries regulations/lack of enforcement presence (patrols) was a major issue of concern in both districts but more so in STT/STJ. Issues included the harvest of juvenile fish, lobster and conch, illegal commercial fishing activities and vandalism of boats, vehicles and moorings. Neither district identified the Need for Fisheries Management as important. Most fishers would agree that additional fisheries regulations are not needed if the existing regulations were enforced (W. Tobias, pers. obs.). DEE has numerous responsibilities that include boating safety, marine spill and response, hazmat response, permit compliance, public safety backup, federally deputized to assist the US Coast Guard in drug interdiction and illegal alien entry, as well as enforcing fish and wildlife regulations in the territory. Unfortunately, the least amount of funding is provided for enforcement of fish and wildlife regulations. To better serve the boating and fishing community, additional enforcement staff is needed to establish a separate marine enforcement unit.

The extensive development of the coastal areas in the USVI has resulted in the loss of mangroves, seagrass and coral reefs, important nursery habitat for reef fish, lobster and conch. Besides the direct physical impact of habitat alteration from coastal development, development on steep slopes in upland watersheds results in non-point source pollution to sensitive inshore habitats. When disturbed sediments on upland slopes are not contained on-site during rainfall events, sediments wash into the sea, creating turbid water quality conditions and smothering benthic organisms on shoreline mangroves, seagrass beds and coral reefs. Re-suspension of fine upland sediments by wave energy further exacerbates the problem. Respondents from STT/STJ particularly noted that environmental degradation impacted inshore water quality and coral reefs; thus, affecting their recreational fishing experience.

Recommendations: The open response questions allowed the respondents an opportunity to freely express their views. The comments by recreational fishers to this question and Q19 will be provided to DPNR to assist them in tailoring their federal fisheries programs so that they further enhance the recreational fishing experience of Virgin Islanders. In the future, we recommend that these types of open ended opinion questions be conducted by DEE or DFW

during annual boater registration. In the past, DFW has done these opinion surveys during commercial fisher registration. Given that one of the main funding sources of DFW is the USFWS Sportfish Restoration Grants, it may be useful for DFW to do an opinion survey during the annual boat registration as well.

A few fishers pointed out the need for a recreational fishing license in their response to this question and Q19. A question relating to the perceived need and/or acceptance of a recreational fishing license by boat-based recreational fishers should be included in a follow-up survey. The USVI legislature has not been supportive of a recreational fishing license, seeing it as a burden on local recreational fishers. However, this issue has not been addressed directly with recreational fishers. The question should include some information on the need for a recreational fishing license, how the license money would be used and ask fishers if they support or oppose a license requirement if it cost X dollars per annum (with several options provided) and is required for persons of certain ages and residencies (VI ID vs other ID) (with several options provided).

Given the number of NSAR and HMS anglers that obtained permits to fish in USVI federal waters, the number of tourists visiting the USVI annually, the transient vessels visiting and participating in fishing tournaments, and the number of residents that may be involved in recreational fishing, substantial revenue could be generated from a recreational license program to support a recreational fisheries management and enforcement program.

Contact Preference (Q 18)

Respondents identified that, in order of priority, their preferred method of contact for future surveys was phone (43%), mail (35%), e-mail (21%) and in person (6%). The response rate by boaters to the survey was greater in the phone survey (60%) than in the mail survey (40%) (Tables 89 and 91). The shift and conversion by island residents to cell phones from land lines requires the attention of DPNR-DEE to specifically record cell phone numbers during boater registration. Besides the personal convenience of carrying a cell phone for land communications, boaters are relying on cell phones for offshore communication instead of installing a VHF radio onboard their vessel (W. Tobias, pers. obs.). This may be compromising their safety at sea since cell phones have power and reception limitations.

Obtaining accurate and complete mailing addresses from the USVI boater registration database was challenging and time consuming. Care must be taken by DEE during the collection and recording of boater registration data to maintain a database that will be useful in contacting boaters when needed. A new field of Email addresses needs to be included in the database.

Approximately 70% of vessel owners register their boats during the first three months of boater registration (H. Forbes, DEE, pers. com.). Although only 6% of the respondents indicated that they would like to be contacted in person, all boat owners must personally register their vessels annually. By including a step in the registration process to electronically collect in-person interviews by trained interviewers, while the registration paperwork is in progress, it would be possible to update the registrants contact information and possibly sample a greater number of boat-based recreational fishers than in a phone survey.

Recommendations: Specific brief in person surveys with boat-based recreational fishers and commercial fishers would be possible by trained interviewers during boater registration. Staff employed by the consultant for an operational survey could, as part of their job description, be involved in the boater registration process to enable the collection and cataloguing of essential survey data. The most important data required for a phone survey and subsequent expansion of the data would be current home and cell phone numbers, state of residence, use category, and type and length of boat being registered for every boat registrant. Boat types should be revised with the consent of DEE, since some boat types are ambiguous. For example, a cruiser could be a power boat or a sail boat

Additional Comments about Recreational Fishing in the USVI (Q19)

The Need for Regulations regarding recreational fishing was the most important issue with 23 specific comments (18% of total comments). There were five comments that specifically related to the need for species size limits with one commenter stating that this would help prevent the harvest of juvenile fish. There were seven comments that mentioned the need for boat quotas, harvest limits, or bag limits. Three comments referred to the need for a recreational fishing license. Five comments were related to the need for more area closures, the implementation of rotational closures, or spawning season closures.

In contrast, there were only 3 comments (2%) that there were too many regulations for recreational fishers. However, seven of the eight comments related to Marine Protected Areas (MPAs) were against at least some of the area regulations within MPAs. Most of these comments stated that there were too many area closures or outright opposed restricted areas. Only one respondent stated that there was a need for MPAs and stated that they were needed to replenish stocks.

There were 10 comments (8%) related to enforcement issues. There were 8 comments about the lack of enforcement of regulations. One respondent recommended that DEE be more polite and professional with recreational fishers and another indicated that security on STX, presumably in the vicinity of boat launching sites, was very bad since his vehicle was broken into twice in the past year.

Overfishing was the second issue most important issue with 16 specific comments (12%). There were 13 comments that mentioned the decline in catch over the years attributing this to commercial fishing with fish traps (4 comments) and nets (1) and the Japanese fleet (1). Most comments were complaints about the lack of fisheries resources (8) or the lack of trophy fish (1). One commenter felt it was the individual's responsibility to maintain and police the fishing industry.

There were 13 comments (10% of comments) the Need for More/Improved/Repaired Boat Access facilities. There were 2 comments that specifically mentioned the need to repair the Frederiksted fishermen's pier and boat ramp. One commenter complained about the lack of boat haulout facilities on St. John and another specifically stating that the government has taken up all the dock space in Cruz Bay, St. John.

There were 10 comments (8% of responses) about the Need for Fisheries Enhancement. There were 8 comments that mentioned the need to maintain, replace or install new fish attraction devices (FADs). While FADs are generally used by line fishers, one respondent mentioned that they were needed for spearfishing. One respondent wanted private docks to be permitted for recreational fishing.

Two respondents made comments related to Lionfish, an invasive species that has relatively recently arrived in the US Virgin Islands and two commented on Environmental Degradation. It was surprising that so few people commented about the latter.

There were nine comments (7%) (2 on STT/STJ and 7 on STX) on the Need for Recreational Fishing Education. Specific comments included: DFW should involve more recreational fishers in their programs (1 comment), the need to educate young people about fishing (2), DFW should provide a copy of the fishing regulations during boat registration (1), and the need to educate fishers on how to keep the fishery heathy (3).

Recommendation: It is important for recreational fishers to have a venue for expressing their opinions, both positive and negative, about recreational fishing in the USVI. Questions 17 and 19 provided an opportunity for this. Hopefully, agencies of the VI Government – DEE and DFW will look at fisher comments in this report and move forward with remedying some of the concerns expressed about boat access facilities, FADs, enforcement, education of recreational fishers regarding regulations and conservation of fisheries resources, and the need for regulations to prevent overfishing such as size limits and bag limits, but no more for area closures on STX. DEE or DFW can conduct an information/education program similar to that conducted for the commercial fishers and ask recreational fishers to respond to questions similar to Questions 17 and 19 or solicit responses using a drop box format during annual boater registration.

Surveys that include questions such as these are best carried out by the agencies responsible for providing the services mentioned by respondents. These agencies include the CFMC and the VI DPNR DFW and DEE. In the future, DFW and DEE might want to ask fishers specific questions about some of the issues herein in a survey of their own, especially if they have the funding to remedy some of these issues. For example, the CFMC has a responsibility to educate recreational fishers about federal recreational fishing regulations. The CFMC could produce a booklet in conjunction with VI DPNR and DFW/DEE that summarizes federal and territorial recreational fishing regulations and the booklet could be distributed during boat registration. Or the CFMC could provide funding for the more comprehensive Commercial and Recreational Fisher Booklet produced by DFW and DEE to be distributed to recreational fishers when boats are registered. Funds to build, maintain, and enhance boat access facilities are provided to DFW by the US Fish and Wildlife Service's (USFWS) Sportfish Restoration grants. During boat registration, DFW could survey boaters regarding their needs with respect to boat ramps/docks/parking so as to target their efforts and funds to fulfill the greatest needs. This would reduce the concern of USFWS that the boat access sites are primarily used by commercial fishers and not recreational fishers because the Sportfish Restoration funding is for recreational fisheries enhancement only. Having a contractor collect the data for state or federal agencies ensures a higher degree of confidentiality and impartiality.

Recommendations

1. USVI boater registration database management needs to be the next phase in the MRIP development process to enable the timely and efficient use of this database as a frame for collecting MRIP data from boat-based recreational fishers or contacting and transmitting information to registered boaters. Maintenance of the DPNR-DEE boater registration database is currently not a priority. Critical boater information, including name, mailing address and phone number (cell phone and home phone) needs to be updated annually. Registrant information should also include email address, if available. Registrant information should be timely entered in the electronic database. QA/QC checks on the database should be routinely made with hardcopy files. Hardcopy files should be updated and organized.

   Database management should be within the job description of a full-time DEE employee. DEE receives federal funding through the US Coast Guard Recreational Boating Grant to conduct boater registration; however, the funding is insufficient to maintain staff for only this purpose (H. Forbes, pers, com.). A future MRIP grant objective could be to provide technical assistance to DEE for boater registration database organization and management (updating critical boater information annually based on the needs of DEE and MRIP). If the DEE boat registration database is used in the operational MRIP surveys in the USVI as recommended in this report, then it would be important to supplement the salaries of DEE database management staff to encourage annual updating of the database. However, MRIP funding should be contingent on annual submission to MRIP of an updated boat-registration database. If a territorial recreational fishing license program is implemented, then revenue generated from the recreational license program could be used to fund administrative personnel for processing recreational fishing licenses during boater registration and for updating the boater registration database, instead of using MRIP funds.

2. The USVI needs to develop a data collection program to satisfy the exempted state status of NSAR. USVI recreational fisher compliance with NSAR permits to fish in federal waters is low. Under the NSAR and State Exemption Program of 2012, the USVI can apply for exempted status with a qualifying state (territorial) data collection program but has failed to so. The establishment of a saltwater recreational fisheries license program would enable the USVI to begin collecting information on the contact information and number of saltwater anglers. Providing this information annually to the NSAR program would bring the USVI into compliance with the NSAR and State Exemption Program of 2012. Significant groundwork in support of a recreational license program in the USVI has been accomplished by DPNR and the local fisheries advisory committees (Tobias 2010). To move this effort forward, support could be provided by NOAA's Coral Reef Conservation Program affiliates to conduct a series of information and education seminars for the public and Virgin Islands legislators promoting the importance and benefits of a territorial marine fisheries license program.

3. A targeted study needs to be conducted as part of the next phase of the MRIP development process to identify the recreational fishing effort in territorial and federal waters of the USVI by anglers and For-Hire vessels registered in the HMS and NSAR databases. The stateside

residents (HMS – 15, NSAR – 862) and those registered from Puerto Rico (HMS - 3, NSAR – 192, including 10 NSAR registered For-Hire vessels) represent an important component of the recreational fishing sector that has not been surveyed.

4. A targeted study needs to be conducted as part of the next phase of the MRIP development process to identify the recreational fishing effort of charter vessels, both resident and transient, and fishers operating rental vessels in the USVI. A relatively small but consistent charter vessel fleet exists year-round in the USVI and is greatly inflated with vessels from the US and PR during billfish season. Data is not routinely collected from this specialized recreational fishery. Similarly, recreational fishing from boat rentals would also increase during the tourist season. Information on this fishing effort is also lacking. Given the small number of local charter vessels and rental vessels, 100% of vessels in these categories should be sampled. Transient vessels usually visit the USVI during the marlin tournament season. A list of vessels could be obtained from the sportfishing clubs and tournament organizers in each district. We recommend sampling the entire fleet through the distribution of logbooks combined with in person interviews to collect the data, provided that the number of vessels in the fleet is not excessively large.

5. Some commercial fishers also fish recreationally. Boat registrants that are licensed commercial fishers should be surveyed separately regarding their participation in recreational fishing. The Virgin Islands has a small scale commercial fishery and the line between recreational fishing and commercial fishing is blurred. Commercial fishers will likely sell at least part of the fish that they catch recreationally if they catch enough and there is a market for the species. All but one commercial fisher, who recreationally fished, reported their recreational catch on the CCR forms. The need for revising the CCR forms to separate recreational and commercial catches should be further tested.

   We recommend that a survey of 100% of commercial fishers be conducted to determine the frequency of recreational fishing among commercial fishers and if they record their recreational catches on their CCRs. We recommend that the forms not be modified, if only a few commercial fishers recreationally fish, do so infrequently, sell fish from recreational catches if in excess of their home needs, and/or usually report their recreational catch on their CCRs.

   Although in-person surveys were not rated highly, this simple survey to determine if changes in the CCRs are warranted could be conducted by DFW during commercial fisher registration in July. The questions in this survey of commercial fishers should include:

   Do you recreationally fish? Yes No
   How many times per month or year do you recreationally fish? _____ Month or _____ Year
   How many lbs of fish do you catch on average during each fishing trip? _____ lbs
   Do you ever sell your recreationally caught fish? Yes No
   Do you report your recreationally caught fish on your catch reports? Yes No
   Would you be willing to complete an additional survey on the fish you catch recreationally? Yes No

6. The present pilot study indicates that an expanded MRIP telephone survey should be successful in the USVI; response rate of the telephone survey (60%) was higher than the extended four-month mail survey (40%). Individual responses to survey questions were generally higher in the telephone survey than the mail survey. Of the two survey methods used in this pilot study, telephone interviews were also the preferred method of contact indicated by the respondents. Not only was the response rate higher but more complete responses were elicited. This method is less time consuming than the mail surveys which required several follow-up mailings to try to increase the response rate. Also, with mailings, few contacts responded to the postcard asking whether they wanted the survey in Spanish or English. As a result, boat owners with Spanish surnames were mailed both an English and a Spanish copy of the survey form. Some Spanish speaking only anglers may have only received an English questionnaire and not responded. The success of the telephone survey was directly related to the interviewer's knowledge of the fishery, fishermen, and fluency in English and Spanish. Improved management of the boater registration database would provide updated contact information (phone numbers), which in turn would likely increase the response rate to the survey. The use of incentives was not substantially effective in increasing the response rate in the USVI and should not be continued.

7. For this pilot study, it was unclear what the response rate might be using mail and telephone surveys as compared to the last time a telephone survey was conducted for this population (registered boaters) (Eastern Caribbean Center, 2002). While the overall response rate was 39% and the completed survey response rate was 14% in the Eastern Caribbean Center (2002) study, it was considered likely that the response rate would be higher in this study because of the more intensive search of data files for contact information compared to the 2002 study and shorter time lag between collecting of contact information and conducting the study. In the Eastern Caribbean Center (2002) study, the boat registration spreadsheet was based on photographs of the most recent registration data sheets. An extensive search for phone numbers and addresses in hardcopy files was not done. We found that registrants often did not provide phone numbers or addresses when they filled out their registration forms or were not asked for updated information when DEE personnel filled out their forms..

   Since response rates are generally decreasing in the continental US (V. Lesser, pers.com), it was of interest to determine whether or not the response rate could at least match the response rate last recorded for this population of recreational fishers (Eastern Caribbean Center, 2002). However, only 17% of individuals of the initial sample size of 800 (Table 2) and only 19% of the modified sample size of 769 responded and recreationally fished (Table 95).

   Since data has been collected for all variables, measures of variability can be used to compute the sample size needed to obtain estimates within a fixed level of precision for the operational survey (V. Lesser, pers com). However, given the few respondents in this study for some combinations of fishing at a specific marina, dock, or species, it will be important to determine which marina, dock or species is most important to obtain estimates for a specified margin of error. If all species would be deemed equally important, a full census of all boaters might be recommended. Conducting a census may be too costly and therefore

decisions would need to be made to determine which species are the most important. Given the low percentage of recreational fishers among boat registrants, we can assume that the samples size will increase. If the USVI boat registration database management is improved by annually updating contact information, previously unreachable boaters will be able to be contacted, which would increase the response rate and increase the sample size of the survey.

8. Future survey questions should be clear and concise and respond to objectives of both the territorial and federal agencies responsible for fisheries management.

9. This survey provides information on the landing sites used by recreational fishers and the number of fishers using each landing site. However, we did not ask about frequency of use. When fishers list the landing sites that they used, they could also be asked how many times they used each site in the last month. This would provide further information for weighting shore-based sampling of landings, etc. This information should be obtained in an operational survey.

10. An operational survey should include identification of the days of the week fished.

11. Future sampling effort in an operational survey should target important fishing types and target species identified in the respective districts for the pilot study. Interviewers should have knowledge of the fishery, including knowledge of the fishing gear and common and local fish names, which may vary by district. Sufficient long-term data should be utilized to identify species seasonality,

12. Territorial and federal agencies should be encouraged to consult with local Fisheries Advisory Committees to identify ways to improve the recreational fishing experience based on priority issues identified in the pilot study (i.e., Marine Protected Areas, Enforcement, Overfishing, Environmental Degradation and the Need for Regulations).

13. The percent household's food consumption from recreational fishing would be directly related to the success of the angler's fishing effort. Some anglers found this question difficult to interpret. Unless specific socio-economic information is desired, this question could be omitted from future surveys.

14. Unless it appears that boat ownership is changing in the USVI, the part of Question 8 asking about the boat most often used for recreational, subsistence or charter fishing can be omitted. In 95% of cases, fishers reported using their own personal boat. The same question asks fishers about the type and length of the boat they used for recreational fishing. This is probably still important, but instead of asking for information about the most important, second most important, etc., fishers should only be asked about the boat the use most often when they recreationally fish.

15. This survey provides information on the families and species of fish targeted by recreational fishers. This information should be taken into account in determining the species selected to be included in the island-based Fishery Management Plans currently being developed by the Caribbean Fishery Management Council.

16. Table 97 summarizes our recommendations on the questions that should be included, modified or omitted from the future operational survey.

Table 97. Recommendations on the questions from the pilot survey to include, modify, or omit from an operational survey.

Question #	Recommendations
1	Include
2	Modify: If respondent is a commercial fisher, irrespective of whether they recreationally fish, interview ends. Commercial fishers will be surveyed separately and with questions focusing on whether they need to be included in future recreational fishing surveys.
3	Omit
4	Omit: To be included in separate commercial fisher survey.
5a-f	Modify: Instead of asking if they 'Always,' 'Usually,' etc. use a type of boat, instead have them respond "Yes' or "No'. The more detailed responses regarding frequency was not that informative. It is sufficient to simply determine if they use the type of boat or not.
6	Omit: This type of question could be included if it is thought that there is a notable change in the reasons for recreationally fishing.
7	Omit or modify: There were a wide range of answers and it was unclear how people interpreted the question.
8a-i	Include 8 a-c. Omit 8d-i. The information provided by asking about the 2nd and 3rd most often used boat is minimal. Very few people used jet skis, row boats or kayaks to recreationally fish. That may change, but this change if significant would be reflected in the question on the boat most often used.
9	Include though this question could be modified if more detailed information is required on the fishing location and a mail or in-person survey is implemented.
10a – h	Modify: Only questions 8a-e should be included in future surveys. 8d should be modified to omit 'private boat ramp' since there was confusion because most marinas have private boat ramps. 8e – yacht club should be added. 8f – h often elicited only one or no responses and were insignificant compared to the responses to boat ramps and marinas.
11	Include
12	Include
13	Include
14	Omit: Information on tournaments is collected by DPNR/DFW and reported to NOAA NMFS on a regular basis.
15	Modify: Simplify the number of times a year to Never (0), Sometimes (1-12) and Often (>12)
16	Include, but omit the months: What species of fish and invertebrates (lobster, conch, whelk, crab, etc.) do you target on your fishing trips.
17	Omit: Type of questions more important for local or federal agencies to ask since they are the ones that can implement changes in response to concerns.
18	Include
19	Omit: See question 17 above.

17. Additional question to be included in the next survey:
    a. What days of the week did you recreationally fish in the past month?
    b. How many times did you fish on each day?

_____ Sunday
_____ Monday
_____ Tuesday
_____ Wednesday, etc.

18. Additional question that should be included in next survey:
    a. Do you participate in catch and release fishing? Yes No
    b. If yes:
        i. Where do you do catch and release fishing?
            1. Shoreline
            2. < 3mi
            3. > 3mi
        ii. If you catch and release fish from the shoreline, what bays/locations do you fish _____
        iii. How many times a month do you do catch and release fishing?
        iv. What species do you target when you are catch and release fishing?

Acknowledgements

We would like to thank Drs. Virginia Lesser and Bill Arnold for their comments and suggestions on various drafts of this report. We are also grateful for the assistance of Willy Ventura and Nora Santana who did the telephone interviews. Tina Tobias provided much appreciated assistance with the mail surveys. We are thankful to Howard Forbes, Chief, Division of Environmental Enforcement, for providing an electronic copy of the USVI boater registration database, office space and access to the boater registration hardcopy files and Ms. Donna Jackson, Office Assistant, for help in explaining or correcting discrepancies between St. Thomas/St. John boat registration hardcopy files and the computer database. Dr. Randy Blankenship, Branch Chief, HMS Division, and Dr. Scott Sauri, NOAA Science Information Division, were instrumental in providing copies of the HMS and NSAR databases, respectively, for the USVI. Dr. Joseph Purcel, NOAA Science Information Division and Gordon Colvin, NOAA Affiliate, were helpful in completing NSAR data compliance requests and data interpretation. Drs. Theresa Goedeke, NOAA-NOS and Dr. Jim Berkson, NOAA- NMFS, provided valuable insight into connectivity between CRCP and MRIP-funded recreational fisheries projects scheduled to run concurrently. Partnership with Dr. Goedeke's public outreach program allowed the MRIP project to receive wider public notice and support. Roy Pemberton, Director, Division of Fish and Wildlife, obtained DPNR approval for the distribution of all public service announcements and signed all communications for distribution of the mailings. Funding for this project was provided by NOAA NMFS MRIP, and we acknowledge the Gulf State Marine Fisheries Commission for assistance with fiscal management.

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Appendix I – PSA

PSA in English and Spanish Versions of Newspaper Announcement of Survey -May 2014

GOVERNMENT OF THE VIRGIN ISLANDS OF THE UNITED STATES
========
DEPARTMENT OF PLANNING AND NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
45 MARS HILL
FREDERIKSTED, ST. CROIX, VI 00840
PHONE: (340) 773-1082, FAX: (340) 772-3227

Virgin Islands Boat-based Recreational Fisher Survey - 2014

Dear Virgin Islands Boat Owner:

The Department of Planning and Natural Resources (DPNR) is conducting a survey to better understand recreational fishing around our islands. The results of this survey will be used to improve recreational fisheries management. The best way to understand recreational fishing in the Virgin Islands is to ask anglers about their perspectives on recreational fishing in the Virgin Islands.

Boat owners have been randomly selected from the DPNR, Division of Environmental Enforcement 2013 Boater Registration database to participation in a boat-based recreational fisher survey. You may be contacted either by mail or by phone. Even if you did not fish recreationally during this time period, please complete the mail survey and return it to us. This information is very important for us to know.

Your answers are confidential. Your questionnaire is numbered so we can remove your name from our mailing list once your questionnaire has been returned. Your name, address, and registration number will not be included in the database and will not be used for any purpose other than this survey. This survey is voluntary and you may skip any question you choose not to answer.

The time required to complete the survey will depend on the use of your boat for recreational fishing. Your response, regardless of your recreational fishing effort, is important to us. Please return mail survey questionnaires in the enclosed self-addressed postage-paid envelope.

Your comments will help the Division of Fish and Wildlife improve recreational fisheries management and include anglers' perspectives on recreational fishing in the Virgin Islands. If you have any questions about participating in this survey, please contact Roy. A. Pemberton, Jr., Director, Division of Fish and Wildlife, at 340-513-3170 or William (Toby) Tobias, Virgin Islands project coordinator, at 340-226-9734.

Thank you in advance for your assistance.

ENCUESTA EN BASE A EMBARCACIONES DE PESCADORES RECREATIVOS EN LAS ISLAS VIRGENES -2014

Estimado dueño de embarcación en las Islas Vírgenes:

El Departamento de Planificación y Recursos Naturales (DPNR, por sus siglas en inglés) está llevando a cabo una encuesta con el propósito de adquirir mejor conocimiento sobre la pesca recreativa alrededor de nuestras islas. Los resultados obtenidos en esta encuesta serán utilizados para mejorar el manejo de las pesquerías recreativas. La mejor manera de entender la pesca recreativa en las Islas Vírgenes es preguntándole a los pescadores cuáles son sus perspectivas sobre la misma.

Hemos seleccionado dueños de embarcaciones del banco de data del Registro de Embarcaciones de 2013, de la División de Cumplimiento de Leyes Ambientales del DPNR, al azar, para participar en la encuesta en base a embarcaciones de pescadores recreativos. Nos estaremos comunicando con usted mediante correo electrónico o por teléfono. Aunque usted no haya pescado recreativamente durante este período de tiempo, por favor complete y devuélvanos la encuesta a vuelta de correo. Esta información es muy importante para nosotros.

Las respuestas son confidenciales. Su cuestionario ha sido enumerado con el propósito de remover su nombre de nuestra lista de correo una vez nos devuelva el mismo. Su nombre, dirección, y número de registración, no será incluido en el banco de data, únicamente será utilizado para esta encuesta. La encuesta es voluntaria, y usted puede pasar por alto cualquier pregunta que no desee contestar.

El tiempo requerido para completar esta encuesta depende del uso de su embarcación para la pesca recreativa. Independientemente de su esfuerzo en la pesca recreativa, su respuesta es importante para nosotros. Por favor, devuelva este cuestionario a vuelta de correo en el sobre pre dirigido y pre franqueado adjunto.

Sus comentarios ayudarán a la División de Pesca y Vida Silvestre a llevar a cabo un mejor manejo de la pesca recreativa, incluyendo las perspectivas de los pescadores recreativos de las Islas Vírgenes. Si tiene cualquier pregunta referente a su participación en esta encuesta, favor de comunicarse con Roy A. Pemberton, Jr., Director de la División de Pesca y Vida Silvestre, al (340) 513-3170, o con William (Toby) Tobias, Cordinador del Projecto en las Islas Vírgenes, al (340) 226-9734.

Gracias anticipadas por su cooperación.

Appendix II – Pre-letter sent to Participants in the Phone Survey

Introductory Letter to Individuals Selected to Participate in Phone Survey in English and

GOVERNMENT OF THE VIRGIN ISLANDS OF THE UNITED STATES
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DEPARTMENT OF PLANNING AND NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
45 MARS HILL
FREDERIKSTED, ST. CROIX, VI 00840
PHONE: (340) 773-1082, FAX: (340) 772-3227

May 5, 2014

Dear Virgin Islands Boat Owner,

Within the next few weeks, you will receive a call requesting your opinions about recreational fishing in the U.S. Virgin Islands. The Division of Fish and Wildlife (DFW) of the Virgin Islands Department of Planning and Natural Resources (DPNR) is interested in gaining a better understanding of recreational fishing in the USVI.

I am writing you now because we have found that many people like to know ahead of time that they may be contacted for information regarding a study. This study is important and will help DFW to better manage our fisheries.

Thank you in advance for your time and consideration. It's only with the generous help and cooperation of people like yourselves that this research can be successful.

Sincerely,

Roy A. Pemberton, Jr.
Director

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DIVISION OF FISH AND WILDLIFE
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PHONE: (340) 773-1082, FAX: (340) 772-3227

05 de mayo del 2014

Estimado Propietario de Embarcación de las Islas Vírgenes,

EL Departamento de Planificación y Recursos Naturales de las Islas Vírgenes (DPRN) y La División de Pesca y Vida Silvestre (DPVS), están interesados en aprender y conocer mejor la pesca recreacional de las Islas Vírgenes Estadounidenses. Dentro de las próximas dos semanas, usted recibirá una llamada solicitando sus opiniones acerca de la pesca recreacional en las Islas Vírgenes Estadounidenses.

Le estoy escribiendo por el motivo de que tenemos conocimientos de que ha muchas personas les gustaría saber con tiempo de anticipación de que podrían ser contactados para obtener información con respecto a un estudio sobre la pesca recreacional en las Islas Vírgenes. Este estudio es importante y ayudara a la DPVS a mejorar la administración de nuestras pescaderías.

Gracias con anticipación por su tiempo y consideración. Este estudio será un éxito únicamente con la ayuda, colaboración y generosidad de personas como usted

Amablemente,

Roy A. Pemberton, Jr.
Director

Appendix III – Pre-letter Sent to Participants in the Mail Survey
English and Spanish Versions

GOVERNMENT OF THE VIRGIN ISLANDS OF THE UNITED STATES
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Thank you in advance for your time and consideration. It's only with the generous help and cooperation of people like yourselves that this research can be successful.

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Le estoy escribiendo por el motivo de que tenemos conocimientos de que ha muchas personas les gustaría saber con tiempo de anticipación de que podrían ser contactados para obtener información con respecto a un estudio sobre la pesca recreacional en las Islas Vírgenes. Este estudio es importante y ayudara a la DPVS a mejorar la administración de nuestras pescaderías.

Gracias con anticipación por su tiempo y consideración. Este estudio será un éxito únicamente con la ayuda, colaboración y generosidad de personas como usted.

Amablemente,

Roy A. Pemberton, Jr.
Director

Appendix IV – Post Card – Mail Survey Only

Post Card Requesting Preferred Language
Sent with Introductory Letter

William Tobias
Project Coordinator
P.O. Box 3025
Kingshill, VI 00851

Please circle the survey questionnaire language desired:

English Spanish

Por favor circule el lenguaje deseado de la encvesta:

Engles Espanol

APPENDIX V – Letter Accompanying the First Mailing of the Questionnaire
English - No Incentive & Incentive Letters
Spanish – No Incentive and Incentive Letters

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DIVISION OF FISH AND WILDLIFE
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PHONE: (340) 773-1082, FAX: (340) 772-3227

May 5, 2014

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A boat registered in your name was randomly selected from the DPNR, Division of Environmental Enforcement Boater Registration database for participation in a boat-based recreational fisher mail survey. Even if you did not fish recreationally during this time period, please complete the survey and return it to us. This information is very important for us to know.

Your answers are confidential. Your questionnaire is numbered so we can remove your name from our mailing list once your questionnaire has been returned. Your name, address, and registration number will not be included in the database and will not be used for any purpose other than this survey. This survey is voluntary and you may skip any question you choose not to answer.

The time required to complete the survey will depend on the use of your boat for recreational fishing. Your response, regardless of your recreational fishing effort, is important to us. Please return your questionnaire in the enclosed self-addressed postage-paid envelope.

Your comments will help the Division of Fish and Wildlife improve recreational fisheries management and include anglers' perspectives on recreational fishing in the Virgin Islands.

If you have any questions about participating in this survey, please contact Roy A. Pemberton, Jr., Director of the Division of Fish and Wildlife, at 340-513-3170 or William (Toby) Tobias, Virgin Islands project coordinator, at 340-226-9734.

Thank you in advance for your assistance.

Sincerely,

Roy A. Pemberton, Jr.
Director

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May 5, 2014

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Your answers are confidential. Your questionnaire is numbered so we can remove your name from our mailing list once your questionnaire has been returned. Your name, address, and registration number will not be included in the database and will not be used for any purpose other than this survey. This survey is voluntary and you may skip any question you choose not to answer.

The time required to complete the survey will depend on the use of your boat for recreational fishing. Your response, regardless of your recreational fishing effort, is important to us. Please return your questionnaire in the enclosed self-addressed postage-paid envelope.

Your comments will help the Division of Fish and Wildlife improve recreational fisheries management and include anglers' perspectives on recreational fishing in the Virgin Islands. The enclosed $2.00 bill is a token of appreciation for your anticipated participation in our survey.

If you have any questions about participating in this survey, please contact Roy A. Pemberton, Jr., Director of the Division of Fish and Wildlife, at 340-513-3170 or William (Toby) Tobias, Virgin Islands project coordinator, at 340-226-9734.

Thank you in advance for your assistance.

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05 de mayo del 2014

Estimado Propietario de Embarcación de las Islas Vírgenes,

El Departamento de Planificación y Recursos Naturales (DPRN), está llevando a cabo un estudio para entender y conocer mejor la pesca recreacional alrededor de nuestras islas. Los resultados de este estudio serán utilizados para el mejoramiento administrativo de nuestras pescaderías recreacionales. La mejor forma de entender la pesca recreacional en las Islas Vírgenes es preguntándole a los mismos pescadores acerca de cuál es su punto de vista sobre la pesca recreacional en las Islas Vírgenes.

La embarcación registrada con su nombre fue seleccionada al azar por el DPRN, División de Oficiales de Recursos Naturales, de la información de datos de las embarcaciones registradas, para hacer posible que este estudio se realice. Aunque usted no pesque recreacionalmente durante este tiempo, por favor complete el cuestionario y devuélvalo a nosotros. Para nosotros es muy importante saber su opinión acerca de esta información.

Sus respuestas son confidenciales. Su cuestionario esta enumerado de forma que nosotros podamos remover su nombre de nuestra lista de correspondencias una vez su cuestionario sea devuelto. Su nombre, dirección, y número de registración no serán incluidos en la información de datos, y no serán utilizados para cualquier otro propósito que no sea para el de este cuestionario. Este estudio es voluntario y usted podrá omitir cualquier pregunta que usted escoja no contestar.

El tiempo requerido para completar este estudio dependerá del uso de su embarcación para la pesca recreacional. Sus respuestas, en este cuestionario, sobre la pesca recreacional, son importantes para nosotros. Por favor devuelva su cuestionario dentro del sobre adjunto con dirección y franqueo pagado.

Sus comentarios ayudaran a la División de Pesca y Vida Silvestre a mejorar la administración y el funcionamiento de las pescaderías recreacionales y esto también incluirá el punto vista de los pescadores sobre la pesca recreacional en las Islas Vírgenes.

Si usted tiene algunas preguntas acerca de su participación en este estudio, favor de ponerse en contacto con Roy A. Pemberton, Jr., Director de la División de Pesca y Vida Silvestre, al 340-513-3170 o William (Toby) Tobías, Coordinador de Proyecto de las Islas Vírgenes al 340-226-9734.

Gracias por adelantado por su cooperación.

Amablemente,

Roy A. Pemberton, Jr.
Director

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05 de mayo del 2014

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El tiempo requerido para completar este estudio dependerá del uso de su embarcación para la pesca recreacional. Sus respuestas, en este cuestionario, sobre la pesca recreacional, son importantes para nosotros. Por favor devuelva su cuestionario dentro del sobre adjunto con dirección y franqueo pagado.

Sus comentarios ayudaran a la División de Pesca y Vida Silvestre a mejorar la administración y el funcionamiento de las pescaderías recreacionales y esto también incluirá el punto de vista de los pescadores sobre la pesca recreacional en las Islas Vírgenes. Adjunto encontrara un billete de $2.00 como obsequio de apreciación por su anticipada participación en nuestro estudio.

Si usted tiene algunas preguntas acerca de su participación en este estudio, favor de ponerse en contacto con Roy A. Pemberton, Jr., Director de la División de Pesca y Vida Silvestre, al 340-513-3170 o William (Toby) Tobías, Coordinador de Proyecto de las Islas Vírgenes al 340-226-9734.

Gracias por adelantado por su cooperación.

Amablemente,

Roy A. Pemberton, Jr.
Director

Appendix VI– Reminder Post Card for Mail Survey

William Tobias
P.O. Box 3025
Kingshill, USVI 00851

USA FORVER

REMINDER - Please complete and return the fisheries survey form mailed to you in June.

RECUERDEN - Por favor completar y devolver la encuesta sobre pesca que fue enbiada a usted en junio.

APPENDIX VII – Letter Accompanying Second Mailing of Questionnaire
English and Spanish Versions – No incentive and Incentive Letters

GOVERNMENT OF THE VIRGIN ISLANDS OF THE UNITED STATES

DEPARTMENT OF PLANNING AND NATURAL RESOURCES
DIVISION OF FISH AND WILDLIFE
45 MARS HILL
FREDERIKSTED, ST. CROIX, VI 00840
PHONE: (340) 773-1082, FAX: (340) 772-3227

August 15, 2014

Dear Virgin Islands Boat Owner,

We're sorry that we missed you during our first mailing so we'll try again!
The Department of Planning and Natural Resources (DPNR) is conducting a survey to better understand recreational fishing around our islands. The results of this survey will be used to improve recreational fisheries management. The best way to understand recreational fishing in the Virgin Islands is to ask anglers about your perspectives on recreational fishing in the Virgin Islands.

A boat registered in your name was randomly selected from the DPNR, Division of Environmental Enforcement, boater registration database for participation in a boat-based recreational fisher mail survey. Even if you did not fish recreationally during this time period, please complete the survey and return it to us. This information is very important for us to know.

Your answers are confidential. Your questionnaire is numbered so we can remove your name from our mailing list once your questionnaire has been returned. Your name, address, and registration number will not be included in the database and will not be used for any purpose other than this survey. This survey is voluntary and you may skip any question you choose not to answer.

The time required to complete the survey will depend on the use of your boat for recreational fishing. Your response, regardless of your recreational fishing effort, is important to us. Please return your questionnaire in the enclosed self-addressed postage-paid envelope.

Your comments will help the Division of Fish and Wildlife improve recreational fisheries management and include anglers' perspectives on recreational fishing in the Virgin Islands.

If you have any questions about participating in this survey, please contact Roy. A. Pemberton, Jr., Director, Division of Fish and Wildlife, at 340-513-3170 or William (Toby) Tobias, Virgin Islands project coordinator, at 340-226-9734.

Thank you in advance for your assistance.

Sincerely,

Roy A. Pemberton, Jr.
Director

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A boat registered in your name was randomly selected from the DPNR, Division of Environmental Enforcement, boater registration database for participation in a boat-based recreational fisher mail survey. Even if you did not fish recreationally during this time period, please complete the survey and return it to us. This information is very important for us to know.

Your answers are confidential. Your questionnaire is numbered so we can remove your name from our mailing list once your questionnaire has been returned. Your name, address, and registration number will not be included in the database and will not be used for any purpose other than this survey. This survey is voluntary and you may skip any question you choose not to answer.

The time required to complete the survey will depend on the use of your boat for recreational fishing. Your response, regardless of your recreational fishing effort, is important to us. Please return your questionnaire in the enclosed self-addressed postage-paid envelope.

Your comments will help the Division of Fish and Wildlife improve recreational fisheries management and include anglers' perspectives on recreational fishing in the Virgin Islands. The enclosed $2.00 bill is a token of appreciation for your anticipated participation in our survey.

If you have any questions about participating in this survey, please contact Roy. A. Pemberton, Jr., Director, Division of Fish and Wildlife, at 340-513-3170 or William (Toby) Tobias, Virgin Islands project coordinator, at 340-226-9734.
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15 de agosto 2014

Estimado Propietario de Embarcación de las Islas Vírgenes,

La mentamos que te echamos de menos durante nuestro primer envio, asi que lo intentaremos de nuevo. El Departamento de Planificación y Recursos Naturales (DPRN), está llevando a cabo un estudio para entender y conocer mejor la pesca recreacional alrededor de nuestras islas. Los resultados de este estudio serán utilizados para el mejoramiento administrativo de nuestras pescaderías recreacionales. La mejor forma de entender la pesca recreacional en las Islas Vírgenes es preguntándole a los mismos pescadores acerca de cuál es su punto de vista sobre la pesca recreacional en las Islas Vírgenes.

La embarcación registrada con su nombre fue seleccionada al azar por el DPRN, División de Oficiales de Recursos Naturales, de la información de datos de las embarcaciones registradas, para hacer posible que este estudio se realice. Aunque usted no pesque recreacionalmente durante este tiempo, por favor complete el cuestionario y devuélvalo a nosotros. Para nosotros es muy importante saber su opinión acerca de esta información.

Sus respuestas son confidenciales. Su cuestionario esta enumerado de forma que nosotros podamos remover su nombre de nuestra lista de correspondencias una vez su cuestionario sea devuelto. Su nombre, dirección, y número de registración no serán incluidos en la información de datos, y no serán utilizados para cualquier otro propósito que no sea para el de este cuestionario. Este estudio es voluntario y usted podrá omitir cualquier pregunta que usted escoja no contestar.

El tiempo requerido para completar este estudio dependerá del uso de su embarcación para la pesca recreacional. Sus respuestas, en este cuestionario, sobre la pesca recreacional, son importantes para nosotros. Por favor devuelva su cuestionario dentro del sobre adjunto con dirección y franqueo pagado.

Sus comentarios ayudaran a la División de Pesca y Vida Silvestre a mejorar la administración y el funcionamiento de las pescaderías recreacionales y esto también incluirá el punto vista de los pescadores sobre la pesca recreacional en las Islas Vírgenes.

Si usted tiene algunas preguntas acerca de su participación en este estudio, favor de ponerse en contacto con Roy A. Pemberton, Jr., Director de la División de Pesca y Vida Silvestre, al 340-513-3170 o William (Toby) Tobías, Coordinador de Proyecto de las Islas Vírgenes al 340-226-9734.

Gracias por adelantado por su cooperación.

Amablemente,

Roy A. Pemberton, Jr.
Director

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Sus respuestas son confidenciales. Su cuestionario esta enumerado de forma que nosotros podamos remover su nombre de nuestra lista de correspondencias una vez su cuestionario sea devuelto. Su nombre, dirección, y número de registración no serán incluidos en la información de datos, y no serán utilizados para cualquier otro propósito que no sea para el de este cuestionario. Este estudio es voluntario y usted podrá omitir cualquier pregunta que usted escoja no contestar.

El tiempo requerido para completar este estudio dependerá del uso de su embarcación para la pesca recreacional. Sus respuestas, en este cuestionario, sobre la pesca recreacional, son importantes para nosotros. Por favor devuelva su cuestionario dentro del sobre adjunto con dirección y franqueo pagado.

Sus comentarios ayudaran a la División de Pesca y Vida Silvestre a mejorar la administración y el funcionamiento de las pescaderías recreacionales y esto también incluirá el punto de vista de los pescadores sobre la pesca recreacional en las Islas Vírgenes. Adjunto encontrara un billete de $2.00 como obsequio de apreciación por su anticipada participación en nuestro estudio.

Si usted tiene algunas preguntas acerca de su participación en este estudio, favor de ponerse en contacto con Roy A. Pemberton, Jr., Director de la División de Pesca y Vida Silvestre, al 340-513-3170 o William (Toby) Tobías, Coordinador de Proyecto de las Islas Vírgenes al 340-226-9734.

Gracias por adelantado por su cooperación.

Amablemente,

Roy A. Pemberton, Jr.
Director

Appendix VIII – Telephone Questionnaire

U.S. VIRGIN ISLANDS
BOAT-BASED RECREATIONAL FISHER PHONE SURVEY - 2014

Hello, my name is _____ . I'm calling on behalf of the Virgin Islands Division of Fish and Wildlife. We're conducting a 5-20 minute phone survey with adults (age 18 and over). The amount of time the survey will take depends on whether you use your boat for recreational fishing. The goal of our survey is to collect recreational fishing information to better understand recreational fishing in the Virgin Islands.

Your participation in this survey is completely voluntary. All information obtained will be pooled together for research purposes. Your name will not be linked individually to your responses and your contact information will not be released to anyone.

Your comments will help the Division of Fish and Wildlife improve recreational fisheries management and include anglers' perspectives on recreational fishing in the Virgin Islands. You may decline to answer any question(s) if you choose. Do you have any questions you would like answered before making a decision about participating in the survey?

NOTE FOR INTERVIEWER: ***If boat registrant or adult family member familiar with the use of the boat is not available, please find out when to call back.***

Call Back Date: _____ Call Back Time: _____

INTERVIEWER: PRE-FILL
BOAT REGISTRANT: _____ REGISTRATION #: _____

DATE/TIME: START: _____ END: _____

PART I – VERIFICATION OF REGISTRANT INFORMATION

1. **Have you owned a boat during the 12-month period beginning January 1, 2013 to December 31, 2013?**

1 ☐ YES ***PROCEED TO QUESTION 2.***

2 ☐ NO ➔ **End Interview**

Thank you! This is all the information we need from you at this time.

PART II –VERIFICATION THAT RESPONDENT RECREATIONALLY FISHES

2. **Have you used your boat(s) during the 12-month period beginning January 1, 2013 to December 31, 2013 for one or more of the following fishing activities?**

a. Recreational Fishing	1 ☐	YES	2 ☐	NO
b. Charter Fishing	1 ☐	YES	2 ☐	NO
c. Subsistence Fishing	1 ☐	YES	2 ☐	NO
d. Commercial Fishing	1 ☐	YES	2 ☐	NO

INTERVIEWER ONLY – DO NOT READ

☐ CAN'T RECALL/DON'T KNOW

DEFINITIONS:
Commercial fishing means you possess a commercial fishing license and a business license to sell fish caught from your boat.
Recreational fishing means you fish for personal enjoyment and do not sell fish but may give some away.
Charter fishing means you possess a USCG captain's license and passengers hire your vessel to recreationally fish.
Subsistence fishing means that you fish to put food on the table for you and your family. If you didn't catch fish your family may go hungry.

If respondent answered "NO" to all fishing activities or "YES" to only commercial fishing:

➔ **END INTERVIEW**

Thank you! This is all the information we need from you at this time.

If respondent answered "YES" to any of the non-commercial fishing activities, continue with the survey.

3. **Have you used your boat at any time during the 12-month period beginning January 1, 2013 to December 31, 2013 for commercial fishing?**

(Check one box then follow arrow to next question.)

1 ☐ NO ➔ ***SKIP TO QUESTION 5.***

2 ☐ YES ***PROCEED TO QUESTION 4.***

4. **As a commercial fisher, do you record the fish that you catch recreationally (i.e., when fishing from your commercial boat for personal enjoyment only) on your commercial catch reports?**

INTERVIEWER ONLY – DO NOT READ

1 ☐ NO ☐ CAN'T RECALL/DON'T KNOW

2 ☐ YES

5. **We would like to find out whose boat you used when you fished during the 12-month period beginning January 1, 2013 to December 31, 2013.**

5a. **Did you use your own personal boat?**

Always	Usually	Sometimes	Never
☐ 1	☐ 2	☐ 3	☐ 4

5b. **Did you use your own commercial boat?**

Always	Usually	Sometimes	Never
☐ 1	☐ 2	☐ 3	☐ 4

5c. **Did you use a boat owned by friends or family boat?**

Always	Usually	Sometimes	Never
☐ 1	☐ 2	☐ 3	☐ 4

5d. **Did you use a hired charter sport fishing boat?**

Always	Usually	Sometimes	Never
☐ 1	☐ 2	☐ 3	☐ 4

5e. **Did you use a rental boat with or without a captain?**

Always	Usually	Sometimes	Never
☐ 1	☐ 2	☐ 3	☐ 4

5f. **Did you use your own charter boat?**

Always	Usually	Sometimes	Never
☐ 1	☐ 2	☐ 3	☐ 4

6. **What are your three main reasons for recreationally fishing?**

(Interviewer -Place number 1 next to the most important reason, number 2 next to the second most important reason and number 3 next to the third most important reason.)

***IMPORTANT NOTE TO INTERVIEWER – Due to length of list, rotate list as you interview each boat owner. For example, first interview start at "a", second interview start at "b", etc*.**

_____a. For sport

_____b. For food

_____c. To be outdoors

_____d. To have fun or relax

_____e. To teach younger generations about fishing

_____f. To spend time with friends and family

_____g. To make money

_____h. Other _____

7. **In a typical month, approximately what percentage of your household's food comes from recreational fishing or gathering other food from the sea?**

1_____%

2_____Can't Recall/Don't Know
(**FOR INTERVIEWER REMARKS ONLY**)

8a. **What type of boat do you use <u>most often</u> for recreational, subsistence or charter fishing?**

1 ☐ Power boat 2 ☐ Sail boat 3 ☐ Row boat 4 ☐ Jet ski 5 ☐ Kayak

BOAT TYPE DEFINITIONS

- Power boat – any boat with an engine as its primary source of propulsion
- Sail boat – any boat with a mast and sails that uses wind as its main source of propulsion
- Row boat – boat propelled by oars
- Jet ski – high speed single or two person personal water craft propelled by water jet
- Kayak – single or two person "boat" propelled by paddles or pedals

8b. What is the length of the boat <u>most often</u> used for recreational, subsistence or charter fishing?

Boat length to nearest foot _____

8c. Who is the owner of the boat most often used?

1 ☐ Own boat 2 ☐ Friend's boat 3 ☐ Rental 4 ☐ Charter

8d. What type of boat do you use <u>2nd most often</u> for recreational, subsistence or charter fishing, if any?

IMPORTANT NOTE TO INTERVIEWER: IF THERE IS ONLY ONE BOAT, PROCEED TO QUESTION 9 OTHERWISE CONTINUE QUESTION 8.

1 ☐ Power boat 2 ☐ Sail boat 3 ☐ Row boat 4 ☐ Jet ski 5 ☐ Kayak

8e. **What is the length of the boat <u>2nd most often</u> used for recreational, subsistence or charter fishing?**

Boat length to nearest foot _____

8f. **Who is the owner of the 2nd most often boat used?**

1 ☐ Own boat 2 ☐ Friend's boat 3 ☐ Rental 4 ☐ Charter

8g. **What type of boat do you use <u>3rd most often</u> for recreational, subsistence or charter fishing, if any?**

IMPORTANT NOTE TO INTERVIEWER: IF THERE ARE ONLY TWO BOATS, PROCEED TO QUESTION 9 OTHERWISE CONTINUE QUESTION 8.

1 ☐ Power boat 2 ☐ Sail boat 3 ☐ Row boat 4 ☐ Jet ski 5 ☐ Kayak

8h. **What is the length of the boat <u>3rd most often</u> used for recreational, subsistence or charter fishing, if any?**

Boat length to nearest foot _____

8i. **Who is the owner of the 3rd most often boat used?**

1 ☐ Own boat 2 ☐ Friend's boat 3 ☐ Rental 4 ☐ Charter

9. **Where did you recreationally fish from the boats you own? Did you fish less than 3 miles from shore, more than 3 miles from shore or both during the 12-month period starting January 1, 2013 and ending December 31, 2013?**

1 ☐ <u>ONLY</u> FISHED LESS THAN 3 MILES FROM SHORE (***PROCEED TO QUESTION 10)***

2 ☐ <u>ONLY</u> FISHED MORE THAN 3 MILES FROM SHORE ***(PROCEED TO QUESTION 10)***

3 ☐ FISHED LESS AND MORE THAN 3 MILES FROM SHORE (***PROCEED TO QUESTION 9a)***

9a. **If fished less and more than 3 miles from shore, please tell us what percent of the total time that you engage in fishing from your boat that you spend fishing less than and more than 3 miles from shore?**

1 LESS THAN 3 MILES _____%

2 MORE THAN 3 MILES _____%

TOTAL = 100%

10. **Where do you most often land your fish when you return to shore with your boat? The choices by island are the following:**

(Interviewer - Please check all sites commonly used.)

ISLAND IMPROVED GOVERNMENT RAMPS

a. St. Thomas: 1 ☐ Krum Bay 2 ☐ Mangrove Lagoon 3 ☐ Hull Bay

b. St. John: 1 ☐ Sea Plane (NPS) 2 ☐ Coral Bay

c. St. Croix: 1 ☐ Frederiksted 2 ☐ Altona Lagoon 3 ☐ Molasses Dock 4 ☐ Cane Bay

d. **Do you use a private boat ramp or unimproved access area.** 1 ☐ YES 2 ☐ NO

If yes, where is it located?_____

e. **Do you use a public or private marina?** 1 ☐ YES 2 ☐ NO

If yes, which one? _____

f. **Do you use a public or private dock.** 1 ☐ YES 2 ☐ NO

If yes, where is it located? _____

g. **Do you use a private residence.** 1 ☐ YES 2 ☐ NO

If yes, where is its general location? _____

h. **Other** (***Please specify)*** _____

11. We are interested in what time of day you usually land your fish. We have divided the day into three-hour time periods starting with midnight to 3 am, 3 am to 6 am, etc. **What are your most frequent, 2nd most frequent and 3rd most frequent times that you RETURN to shore from fishing?**

(Interviewer - Please check one time period for most frequent, one time period for 2nd most frequent and one time period for 3rd most frequent return times).

Return Time	Midnight – 3 am	3 am – 6 am	6 am – 9 am	9 am– 12 Noon	12 pm– 3 pm	3 pm– 6 pm	6 pm – 9 pm	9 pm – Midnight
Most Often								
2nd Most Often								
3rd Most Often								

12. **On average, how many hours do you fish during each trip? _____hours**

13. **On average, how many trips do you take to go fishing in a month?_____trips**

14. **Did you fish in any fishing tournaments during the 12-month period starting January 1, 2013 and ending December 31, 2013?**

1 ☐ NO ***(PROCEED TO QUESTION 15)***

2 ☐ YES ***(PROCEED TO QUESTION 14a)***

14a. **How many times do you participate in fishing tournaments during a typical year? _____times**

15. **During the 12-month period starting January 1, 2013 and ending December 31, 2013, we would like to know the types of fishing that you did. I will read you the types of fishing and ask you to indicate the number of times in the year that you used that fishing type. The frequency choices are Never (0), Rarely (1-2), Sometimes (4-8), Often (9-12) and Very Often (>12)**

***IMPORTANT NOTE TO INTERVIEWER – Please check one frequency box for all fishing types used. Due to length of list, rotate list as you interview each boat owner. For example, first interview start at "a", second interview start at "b", etc*.**

	Number of Times In Year				
Types of Fishing	**Never** *0*	**Rarely** *1-3*	**Sometimes** *4-8*	**Often** *9-12*	**Very Often** *More than 12*
a. Offshore trolling (tuna/dolphin/wahoo/billfish)					
b. Inshore trolling (Jacks/mackerel/barracuda)					
c. Tuna hand-lining					
d. Shallow bottom-fishing (grouper/snapper/grunt, etc)					
e. Deep bottom-fishing (grouper, snapper) - Banking					
f. Spearfishing (scuba or free-diving)					
g. Casting (rod and reel)					
h. Hand collecting (conch/lobster/whelk/octopus)					
i. Cast net (bait, other)					
j. Shallow drift line fishing (yellowtail snapper)					
k. Buoy fishing (live or dead bait fished from surface buoy)					
l. Deep drop fishing - daytime (swordfish)					
m. Deep drift line fishing– night (swordfish)					

16. **In the months that you prefer to fish, what are the species of fish or invertebrates (lobster, conch, whelk, crab, etc.) that you target on your trips.** **For the examples, sand perch is targeted only in March as indicated in line 1. Black seabass is targeted in May through August as indicated in line 2.**

INTERVIEWER: Use one line for each species. Include up to six top species targeted. Draw lines with end bars to indicate additional months fished for a species.

	Months											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Example			**Sand Perch**									
Example						**Black**	**Seabass**					
First Species												
Second Species												
Third Species												
Fourth Species												
Fifth Species												
Sixth Species												

17. **What are the three most important issues affecting your recreational fishing experience in order of priority?** ***Interviewer: List as #1 - top priority, #2 - second priority and #3 - third in priority.***

#1 _____

#2 _____

#3 _____

18. Our goal is to better understand the recreational fishing activities in the Virgin Islands and the experience and concerns of the resource users. If you were selected for a future survey to ask your opinions about your fishing experiences in order to help the Department of Planning and Natural Resources best manage our fishing resources, how would you prefer to be contacted?

(Interviewer -Check the box for the preferred method)

1 ☐ TELEPHONE

2 ☐ MAIL

3 ☐ EMAIL/INTERNET

4 ☐ IN PERSON

19. Is there anything else you would like to say about recreational fishing in the Virgin Islands?

_____
_____
_____
_____
_____
_____

THANK YOU FOR YOUR PARTICIPATION

Interviewer name and initials: _____

Disposition Codes

Result	Date of Contact(s)					
	1	2	3	4	5	6
Complete						
Partial Interview						
Language Barrier						
Call back later						
Refusal						
Busy signal						
Answering machine						
No answer						
Other						
Fax/modem lines						
Disconnected/blocked						
Changed Number						
Out of Area						
Cell phone						
No one over 18						
Business						
Not used						
Total						

Appendix IX – Mail Questionnaire – English

U.S. VIRGIN ISLANDS
BOAT-BASED RECREATIONAL FISHER MAIL SURVEY - 2014

PART I – VERIFICATION OF BOAT REGISTRANT

4. **Have you owned a boat during the 12-month period beginning January 1, 2013 to December 31, 2013?**

   1 ☐ YES ***PROCEED TO QUESTION 2.***

   2 ☐ NO ➔ **Thank you! This is all the information we need from you at this time. Please return the survey in the envelope provided.**

PART II –VERIFICATION THAT RESPONDENT RECREATIONALLY FISHES

5. **Have you used your boat(s) during the 12-month period beginning January 1, 2013 to December 31, 2013 for one or more of the following fishing activities?** ***(Check one box for each activity.)***

   a. Recreational Fishing 1 ☐ YES 2 ☐ NO

   b. Charter Fishing 1 ☐ YES 2 ☐ NO

   c. Subsistence Fishing 1 ☐ YES 2 ☐ NO

   d. Commercial Fishing 1 ☐ YES 2 ☐ NO

IF YOU CHECKED "NO" TO ALL FISHING ACTIVITIES or CHECKED "YES" ONLY TO COMMERCIAL FISHING, THIS IS ALL THE INFORMATION WE NEED FROM YOU AT THIS TIME. PLEASE RETURN THE SURVEY IN THE ENVELOPE PROVIDED.

IF YOU CHECKED "YES" TO ANY OF THE NON-COMMERCIAL FISHING ACTIVITIES, CONTINUE WITH THE SURVEY.

DEFINITIONS:
Recreational fishing means you fish for personal enjoyment and do not sell fish but may give some away.
Charter fishing means you possess a USCG captain's license and passengers hire your vessel to recreationally fish.
Subsistence fishing means that you fish to put food on the table for you and your family. If you didn't catch fish your family may go hungry.
Commercial fishing means you possess a commercial fishing license and a business license to sell fish caught from your boat.

3. **Have you used your boat at any time during the 12-month period beginning January 1, 2013 to December 31, 2013 for commercial fishing? (*Check one box then follow arrow to next question.)***

1 ☐ NO ➔ ***SKIP TO QUESTION 5.***

2 ☐ YES

4. **As a commercial fisher, do you record the fish that you catch recreationally (when fishing from your commercial boat for personal enjoyment only) on your commercial catch reports?**

1 ☐ NO

2 ☐ YES

5. This question asks about how you fish. **When you fished during the 12-month period beginning January 1, 2013 to December 31, 2013, whose boat(s) did you use? (*Please check only one response for each type of boat listed.)***

	Always	Usually	Sometimes	Never
a. My own personal boat	☐ 1	☐ 2	☐ 3	☐ 4
b. My own commercial boat	☐ 1	☐ 2	☐ 3	☐ 4
c. Boat owned by friends/family	☐ 1	☐ 2	☐ 3	☐ 4
d. Hired charter sport fishing boat	☐ 1	☐ 2	☐ 3	☐ 4
e. Rental boat (w or w/o captain)	☐ 1	☐ 2	☐ 3	☐ 4
f. My own charter boat	☐ 1	☐ 2	☐ 3	☐ 4

6. **What are your three main reasons for recreationally fishing? (*Place <u>number 1</u> next to your most important reason, <u>number 2</u> next to the second most important reason and <u>number 3</u> next to your third most important reason.*)**

_____a. For sport

_____b. For food

_____c. To be outdoors

_____d. To have fun or relax

_____e. To teach younger generations about fishing

_____f. To spend time with friends and family

_____g. To make money

_____h. Other _____

7. **In a typical month, approximately what percentage of your household's food comes from recreational fishing or gathering other food from the sea?**

1_____%

2_____Don't Know

What type of boat or boats do you use most often for recreational, subsistence or charter fishing and what is the length? ***Under TYPE, please indicate whether it is power boat, sail boat, row boat, jet ski or kayak.*** **(*Please check the appropriate response under Ownership of boat*).**

	TYPE (see below)	**Length of boat (to nearest foot)**	**Ownership of boat**			
			Own Boat	**Friend's Boat**	**Rental**	**Charter**
Most often						
2nd most often						
3rd most often						

TYPE

- Power boat – any boat with an engine as its primary source of propulsion
- Sail boat – any boat with a mast and sails that uses wind as its primary source of propulsion
- Row boat – boat propelled by oars
- Jet ski – high speed single or two person personal water craft propelled by water jet
- Kayak – single or two person "boat" propelled by paddles or pedals

9. **Where did you recreationally fish using the boats you own? Did you fish less than 3 miles from shore, more than 3 miles from shore or both during the 12-month period starting January 1, 2013 and ending December 31, 2013?**
(Please check only one box.)

1 ☐ ONLY FISHED LESS THAN 3 MILES FROM SHORE (***PROCEED TO QUESTION 10)***

2 ☐ ONLY FISHED MORE THAN 3 MILES FROM SHORE ***(PROCEED TO QUESTION 10)***

3 ☐ FISHED LESS AND MORE THAN 3 MILES FROM SHORE (***PROCEED TO QUESTION 9a)***

9a. **If you fished less and more than 3 miles from shore, what percent of the total time did you spend fishing less than 3 miles from shore and more than 3 miles from shore?**

1 LESS THAN 3 MILES _____%

2 MORE THAN 3 MILES _____%

TOTAL = 100%

10. **Where do you most often land your fish when you return to shore with your boat?** (***Please check box for all sites commonly used.***)

ISLAND IMPROVED GOVERNMENT RAMPS

a. St. Thomas : 1 ☐ Krum Bay 2 ☐ Mangrove Lagoon 3 ☐ Hull Bay

b. St. John: 1 ☐ Sea Plane (NPS) 2 ☐ Coral Bay

c. St. Croix: 1 ☐ Frederiksted 2 ☐ Altona Lagoon 3 ☐ Molasses Dock 4 ☐ Cane Bay

d. Private boat ramp or unimproved access area. **Where is it located?**_____
_____

e. Public or private marina. **Which one?** _____

f. Public or private dock. **Where is it located?** _____

g. Private residence**. General location?** _____

h. Other (**Please specify**) _____

11. **What time do you <u>RETURN</u> to shore from fishing?** (***Please check one time period for most often, one time period for 2nd most often and one time period for 3rd most often).***

Return Time	Midnight – 3 am	3 am – 6 am	6 am – 9 am	9 am– 12 Noon	12 pm– 3 pm	3 pm– 6 pm	6 pm – 9 pm	9 pm – Midnight
Most Often								
2nd Most Often								
3rd Most Often								

12. **On average, how many hours do you fish during each trip?** _____hours

13. **On average, how many trips do you take to go fishing in a month?** _____trips

14. This question asks about fishing tournament participation. **Did you fish in any fishing tournaments during the 12-month period starting January 1, 2013 and ending December 31, 2013?** ***(Please check one box.)***

1 ☐ NO ***(PROCEED TO QUESTION 15)***

2 ☐ YES ***(PROCEED TO QUESTION 14a)***

14a. **How many times do you participate in fishing tournaments during a typical year? _____times**

15. **During the 12-month period starting January 1, 2013 and ending December 31, 2013, how often did you engage in each of the following types of fishing?** ***IMPORTANT NOTE: Fish species given are characteristic of the type of fish caught using the listed gear; they are not the only type of fish that can be caught using the gear.***

(*Please check frequency box for all fishing types that apply to you.*)

	Number of Times in Year				
Types of Fishing	**Never** *0*	**Rarely** *1-3*	**Sometimes** *4-8*	**Often** *9-12*	**Very Often** *More than 12*
a. Offshore trolling (tuna/dolphin/wahoo/billfish)					
b. Inshore trolling (Jacks/mackerel/barracuda)					
c. Tuna hand-lining					
d. Shallow bottom-fishing (grouper/snapper/grunt, etc)					
e. Deep bottom-fishing (grouper, snapper) - Banking					
f. Spearfishing (scuba or free-diving)					
g. Casting (rod and reel)					
h. Hand collecting (conch/lobster/whelk/octopus)					
i. Cast net (bait, other)					
j. Shallow drift line fishing (yellowtail snapper)					
k. Buoy fishing (live or dead bait fished from surface buoy)					
l. Deep drop fishing – daytime (swordfish)					
m. Deep drift line fishing – night (swordfish)					

16. **In the months that you prefer to fish, please write the species of fish or invertebrate (lobster, conch, whelk, crab, etc.) that you target on your trips. Use one line for each species. Include up to six top species you target. Draw lines to indicate additional months fished for a species.**

	Months											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Example			**Sand Perch**									
Example						**Black**	**Seabass**					
First Species												
Second Species												
Third Species												
Fourth Species												
Fifth Species												
Sixth Species												

17. **What are the three most important issues affecting your recreational fishing experience in order of priority? (*Please describe them as #1 top priority, #2 second priority and #3 third priority).***

#1 _____

#2 _____

#3 _____

18. **Our goal is to better understand the recreational fishing activities in the Virgin Islands and the experience and concerns of the resource users. If you were selected for a future survey to ask your opinions about your fishing experiences in order to help the Department of Planning and Natural Resources best manage our fishing resources, how would you prefer to be contacted? (*Check the box for the preferred method.)***

1 ☐ TELEPHONE

2 ☐ MAIL

3 ☐ EMAIL/INTERNET

4 ☐ IN PERSON

19. Is there anything else you would like to say about recreational fishing in the Virgin Islands? _____

_____

_____

_____

_____

_____

_____

_____

THANK YOU FOR YOUR PARTICIPATION

Appendix X – Mail Questionnaire – Spanish

ISLAS VIRGENES ESTADOUNIDENSES
ENCUESTA DE CORREO SOBRE EMBARCACIONES DE PESCA RECREATIVA - 2014

PARTE I: VERIFICACION DEL INSCRIPTOR DE LA EMBARCACION

1. **¿Ha tenido una embarcación propia durante el periodo de 12 meses que comienza el 1ro de enero hasta el 31 de diciembre de 2013?**

   1 □ SI Continuar a la pregunta número 2

   2 □ NO → Gracias!!! Esta es toda la información que necesitamos de usted en este momento. Favor devolver esta encuesta en el sobre incluido a vuelta de correo.

PARTE II: VERIFICACION DE QUE EL ENCUESTADO ES PESCADOR RECREATIVO

2. **¿Ha utilizado su embarcación o embarcaciones en una o más de las siguiente s actividades de pesca durante el periodo de 12 meses que comienza el 1ro de enero hasta el 31 de diciembre de 2013? (*Marque el encasillado para cada una de las actividades).***

   a. Pesca Recreativa 1 □ SI 2 □ NO

   b. Pesca de Bote de Alquiler 1 □ SI 2 □ NO

   c. Pesca para Subsistencia 1 □ SI 2 □ NO

   d. Pesca Comercial 1 □ SI 2 □ NO

SI MARCO "NO" EN TODAS LAS ACTIVIDADES DE PESCA, O MARCO "SI" SOLAMENTE EN EL ENCASILLADO DE PESCA COMERCIAL, ESTA ES TODA LA INFORMACION QUE NECESITAMOS DE USTED EN ESTE

MOMENTO. FAVOR DEVOLVER ESTA ENCUESTA EN EL SOBRE INCLUIDO A VUELTA DE CORREO.

SI MARCO "SI" EN CUALQUIERA DE LAS ACTIVIDADES DE PESCA NO COMERCIAL, CONTINUE CONTESTANDO ESTA ENCUESTA.

DEFINICIONES:

Pesca Recreativa significa que usted pesca para disfrute personal y no vende el producto de su pesca, pero puede regalar el mismo.
Pesca en Bote de Alquiler significa que usted posee una licencia de capitán emitida por el USCG (Guardia Costanera de los Estados Unidos) y alquila su embarcación a pasajeros para la pesca recreativa.
Pesca para Subsistencia significa que el producto de su pesca es para consumo personal y de su familia. Su familia puede carecer de alimento cuando no logra obtener captura.
Pesca Comercial significa que usted posee licencia de pesca comercial, y licencia de negocio que le permite vender los peces capturados en su embarcación.

3. **¿Ha utilizado su embarcación o embarcaciones para la pesca comercial durante el periodo de 12 meses que comienza el 1ro de enero hasta el 31 de diciembre de 2013? (*Marque uno de los encasillados, luego siga la flecha hacia la siguiente pregunta).***

1 □ NO → Continuar a la pregunta número 5
2 □ SI

4. **Como pescador comercial ¿Reporta usted los peces que captura recreacionalmente? (Solamente cuando utiliza su embarcación comercial para recreación personal).**

1 □ NO
2 □ SI

5. El propósito de la siguiente pregunta es conocer cómo pesca. **¿A quién pertenece la embarcación (o embarcaciones) que usted utilizó para pescar durante el periodo de 12 meses que comienza el 1ro de enero hasta el 31 de diciembre de 2013? (Favor de marcar una sola respuesta por cada tipo de embarcación listada).**

	Siempre	Usualmente	A veces	Nunca
a. Embarcación personal	☐ 1	☐ 2	☐ 3	☐ 4
b. Embarcación comercial propia	☐ 1	☐ 2	☐ 3	☐ 4
c. Embarcación de amigos o familiares	☐ 1	☐ 2	☐ 3	☐ 4
d. Embarcación de alquiler para pesca recreativa	☐ 1	☐ 2	☐ 3	☐ 4
e. Embarcación alquilada (con o sin capitán)	☐ 1	☐ 2	☐ 3	☐ 4
f. Embarcación de pesca de alquiler propia	☐ 1	☐ 2	☐ 3	☐ 4

8. **¿Cuáles son sus tres razones principales para pescar recreativamente? (*Escriba <u>1</u> al lado de la razón más importante, <u>2</u> en la segunda razón más importante, y <u>3</u> en la tercera razón más importante*).**

_____a. Como deporte

_____b. Para alimento

_____c. Para disfrutar al aire libre

_____d. Para diversión o relajamiento

_____e. Para educar a las generaciones más jóvenes sobre la pesca

_____f. Para compartir con amigos y familiares

_____g. Para ganar dinero

_____h. Otras _____

9. **Durante un mes regular ¿qué porciento aproximado de alimento proveniente de la pesca recreativa, o cualquier alimento adquirido del mar, es consumido en su hogar?**

1_____%
2_____No se

10. **¿Qué tipo de embarcación o embarcaciones utiliza con mayor regularidad para la pesca recreativa, de subsistencia, o de alquiler, y cuál es su longitud? Por favor indique en la columna de "Tipo" si es una embarcación de motor, de vela, de remos, *jet ski o kayak*. (Favor de marcar la respuesta apropiada en la columna "Propietario de la Embarcación").**

	TIPO (ver abajo)	**Largo de la embarcación (largo más cercano)**	**Propietario de la Embarcación**			
			Bote	**Bote de Amistades**	**Renta**	**Alquiler**
Más frecuente						
2do más frecuente						
3ro más frecuente						

TIPO

- Embarcación de motor – cualquier tipo de embarcación que utilice motor como medio de propulsión
- Embarcación de velas – cualquier tipo de embarcación de vela y mástil que utilice el viento como medio de propulsión
- Embarcación de remos – embarcación propulsada por remos
- Motora Acuática (jet-ski) – embarcación personal acuática de alta velocidad para una o dos personas de propulsión a chorro
- Kayak – Bote para una o dos personas propulsada mediante el uso de remos o pedales

11. ¿**Donde pescó recreativamente utilizando su embarcación personal durante el periodo de 12 meses que comienza el 1ro de enero hasta el 31 de diciembre de 2013? ¿A menos de 3 millas de la costa, a más de tres millas de la costa, o ambas?**

(Favor marcar un solo encasillado)

1 ☐ SOLAMENTE PESQUE A MENOS DE 3 MILLAS DE LA COSTA. (***CONTINUAR A LA PREGUNTA NUMERO 10)***

2 ☐ SOLAMENTE PESQUE 3 MILLAS MAS ALLA DE LA COSTA. ***(CONTINUAR A LA PREGUNTA NUMERO 10)***

3 ☐ PESQUE A MENOS O MAS DE 3 MILLAS FUERA DE LA COSTA. (***CONTINUAR A LA PREGUNTA NUMERO 9a)***

9a. **Si usted pescó a una distancia menor o mayor de 3 millas fuera de la costa ¿cuál es el porciento de tiempo que estuvo pescando en un área menor de 3 millas fuera de la costa, y ¿cuál es el porciento de tiempo que estuvo pescando en un área mayor de 3 millas fuera de la costa?**

1 MENOS DE 3 MILLAS _____%
2 MAS DE 3 MILLAS _____%

TOTAL = 100%

10. **¿Dónde desembarca regularmente su pesca cuando regresa a la costa en su embarcación?** (***Favor de marcar el encasillado para todas las áreas comúnmente utilizadas.*)**

ISLA **RAMPAS DE GOBIERNO MEJORADAS**

a. St. Thomas 1 ☐ Krum Bay 2 ☐ Mangrove Lagoon 3 ☐ Hull Bay

b. St. John: 1 ☐ Sea Plane (NPS) 2 ☐ Coral Bay

c. St. Croix: 1 ☐ Frederiksted 2 ☐ Altona Lagoon 3 ☐ Molasses Dock 4 ☐ Cane Bay

d. Rampas privadas, o áreas de acceso no mejoradas. **¿Dónde está localizada?**_____
_____

e. Marina pública o privada **¿Cuál de las dos?** _____

f. Muelle público o privado ¿**Dónde está ubicado?** _____

g. Private residence**. General location?** _____

h. Other (**Please specify**) _____

11. **¿A qué hora <u>REGRESA</u> cuando pesca de orilla?** (***Favor de marcar un periodo de horas en cada uno de los encasillados, más frecuente, 2do más frecuente, y 3ro más frecuente).***

Hora de Regreso	Medianoche – 3 am	3 am – 6 am	6 am – 9 am	9 am – 12 pm	12 pm – 3 pm	3 pm – 6 pm	6 pm – 9 pm	9 pm – Medianoche
Más Frecuente								
2do Más Frecuente								
3ro Más Frecuente								

12. **¿Cuál es el promedio de horas de pesca en cada viaje?** _____horas

13. **¿En promedio, cuántos viajes de pesca hace al mes?** _____viajes

14. La siguiente pregunta es sobre participación en torneos de pesca. **¿Pescó usted en algún torneo de pesca durante el periodo de 12 meses que comienza el 1ro de enero al 31 de diciembre de 2013?** ***(Favor de marcar un encasillado.)***

1 ☐ NO ***(CONTINUAR A LA PREGUNTA 15)***

2 ☐ SI ***(CONTINUAR A LA PREGUNTA 14a)***

14a. **¿Cuántas veces al año participa en torneos de pesca? _____veces.**

15. **Durante el periodo de 12 meses que comienza el 1ro de enero al 31 de diciembre de 2013 ¿con qué frecuencia utilizó los siguientes tipos de pesca?** ***NOTA IMPORTANTE: Las especies de pesca aquí incluidas son características del tipo de peces capturados con las artes de pesca listadas; pero no constituyen las únicas especies que pueden ser capturadas utilizando estas artes.*** **(*Favor de marcar el encasillado de "Número de Veces al Año" para todo tipo de pesca que aplique.*)**

	Número de Veces al Año				
Tipos de Pesca	**Nunca** *0*	**Casi Nunca** *1-3*	**A veces** *4-8*	**A Menudo** *9-12*	**Muy a Menudo** *Más de 12*
a. Pesca de corrida en alta mar (atún/dorado/peto/pez de pico)					
b. Pesca de corrida costera (jureles/macarela/barracuda)					
c. Pesca de Atún con Cordel a mano					
d. Pesca en aguas someras (mero/pargo/roncos, etc.)					
e. Pesca en aguas profundas (pargos, meros)					
f. Pesca con Arpón (de buceo o a pulmón)					
g. Pesca con caña y carrete					
h. Pesca a mano (carrucho/langosta/burgao/pulpo)					
i. Pesca con atarraya (carnada, otro)					
j. Pesca de corrida en aguas llanas (colirrubia)					
k. Pesca con boya (carnada viva o puerta pescada desde boya de superficie)					
l. Cala de profundidad –de día (pez espada)					
m. Palangre de profundidad – de noche (pez espada)					

16. **Favor de escribir las especies de peces o de invertebrados que en su mayoría constituyen (langosta, carrucho, burgao, cangrejo, etc.) el objetivo de su pesca. Utilice una línea para cada especie. Incluya hasta seis de las especies principales que usted pesca. Dibuje flechas para indicar los meses de pesca adicionales de una especie.**

	Meses											
	ENERO	FEBRERO	MARZO	ABRIL	MAYO	JUNIO	JULIO	AGOSTO	SEPTIEMBRE	OCTUBRE	NOVIEMBRE	DICIEMBRE
Ejemplo			**Sand Perch**									
Ejemplo					←	**Black**	**Seab ass**	→				
Primera Especie												
Segunda Especie												
Tercera Especie												
Cuarta Especie												
Quinta Especie												
Sexta Especie												

17. **¿Cuáles son los tres asuntos más importantes, en orden de prioridad, que afectan su experiencia de pesca recreativa?** (***Favor de describirlos por prioridades. #1 para la prioridad mayor, #2 para a segunda prioridad, y #3 para la tercera prioridad).***

#1 _____

#2 _____

#3 _____

18. Nuestro objetivo es obtener la mejor información y un mayor conocimiento sobre las actividades de pesca recreativa en las Islas Vírgenes Estadounidenses, al igual que conocer las preocupaciones de los usuarios del recurso. Si usted fuera seleccionado para ser parte de una encuesta en el futuro, en la cual solicitaríamos que nos brindara su opinión en relación a sus experiencia en la pesca, con el propósito de ayudar al Departamento de Planificación y Recursos Naturales a manejar más efectivamente nuestros recursos pesqueros ¿de qué forma prefiere que nos comuniquemos con usted? (*Marque el encasillado de su preferencia.)*

1 ☐ TELEFONO

2 ☐ CORREO

3 ☐ CORREO ELECTRONICO/INTERNET

4 ☐ EN PERSONA

19. ¿Desea añadir algún comentario adicional en relación a la pesca recreativa en las Islas Vírgenes Estadounidenses?

_____

_____

_____

_____

_____

_____

_____

_____

GRACIAS POR SU PARTICIPACION

Appendix XI – AAPOR Outcome Rate Calculator Results

Breakdown of the response results from the US Virgin Islands recreational fishing survey of boat registrants. This table includes only those line items in the AAPOR Outcome Rate Calculator version 3.1 November 2010 that pertained to this survey, i.e. lines that contained data for either the telephone or mail survey.

Categories	US Virgin Islands	
	Telephone Survey	Mail Survey
Interview (Category 1)		
Complete - Boat owner was a recreational fisher	82	63
Partial - Boat Owner was not a recreational fisher	154	95
Eligible, non-interview (Category 2)		
Refusal and breakoff		
Refusal	21	
Non-contact	6	
Respondent never available	5	
Answering machine household-message left	35	
Respondent never available		5
Deceased respondent	2	2
Physically or mentally unable/incompetent	1	
Location/Activity not allowing interview	1	
Unknown eligibility, non-interview (Category 3)		
Always busy	3	
Technical phone problems	12	
Nothing returned (mail surveys)		117
USPS: Refused by addressee		3
USPS: No mail receptacle		16
USPS: Undeliverable as addressed		14
USPS: Attempted -- Addressee not known at place of address		30
USPS: Postal box closed		1
USPS: No such number		5
USPS: Vacant		10
Not delivered as addressed (mail surveys)		11
USPS: Unable to forward, no deliverable as addressed		7
USPS: Moved, left no address		1
USPS: Unclaimed -- failure to call for held mail		11
Other		2
Not eligible (Category 4)		
Non-working/disconnect	55	
Number changed	15	
Other / duplicate listing (mail surveys)	8	7

Categories	US Virgin Islands	
	Telephone Survey	Mail Survey
Total phone numbers (or addresses) used	400	400
I=Complete Interviews (1.1)	82	63
P=Partial Interviews (1.2)	154	95
R=Refusal and break off (2.1)	21	0
NC=Non Contact (2.2)	6	5
O=Other (2.0, 2.3)	25	2
Calculating e: e is the estimated proportion of cases of unknown eligibility that are eligible.	0.797	0.959
UH=Unknown Household (3.1)	15	117
UO=Unknown other (3.2-3.9)		111
Response Rate 1 = minimum response rate		
I/(I+P) + (R+NC+O) + (UH+UO)	0.271	0.160
Response Rate 2 = counts partial interviews as respondents		
(I+P)/(I+P) + (R+NC+O) + (UH+UO)	0.779	0.402
Response Rate 3 = includes an estimate of what proportion of cases of unknown eligibility are actually eligible		
I/((I+P) + (R+NC+O) + e(UH+UO))	0.273	0.164
Response Rate 4 = includes an estimate of what proportion of cases of unknown eligibility are actually eligible, and includes partial interviews as completes.		
(I+P)/((I+P) + (R+NC+O) + e(UH+UO))	0.787	0.412
Cooperation Rate 1 = the minimum cooperation rate		
I/(I+P)+R+O)	0.291	0.394
Cooperation Rate 2 = counts partial interviews as respondents		
(I+P)/((I+P)+R+0))	0.837	0.988
Cooperation Rate 3 = defines those unable to do an interview as also incapable of cooperating		
I/((I+P)+R))	0.319	0.399
Cooperation Rate 4 = does the same as COOP3 but includes partials as interviews		
(I+P)/((I+P)+R))	0.918	1.000
Refusal Rate 1 = the number of refusals divided by the interviews (completes and partial) plus the non-respondents plus the cases of unknown eligibility		
R/((I+P)+(R+NC+O) + UH + UO))	0.069	0.000
Refusal Rate 2 = includes estimated eligible cases among the		

Categories	US Virgin Islands	
	Telephone Survey	Mail Survey
unknown cases similar to Response Rates 3 and 4.		
R/((I+P)+(R+NC+O) + e(UH + UO))	0.070	0.000
Refusal Rate 3 = analogous to Response Rates 5 and 6		
R/((I+P)+(R+NC+O))	0.073	0.000
Contact Rate 1 = assumes that all cases of indeterminate eligibility are actually eligible		
(I+P)+R+O / (I+P)+R+O+NC+ (UH + UO)	0.931	0.407
Contact Rate 2 = includes in the base on the estimated eligible cases among the undetermined cases		
(I+P)+R+O / (I+P)+R+O+NC + e(UH+UO)	0.940	0.417
Contact Rate 3 = includes in the base only known eligible cases		
(I+P)+R+O / (I+P)+R+O+NC	0.979	0.970