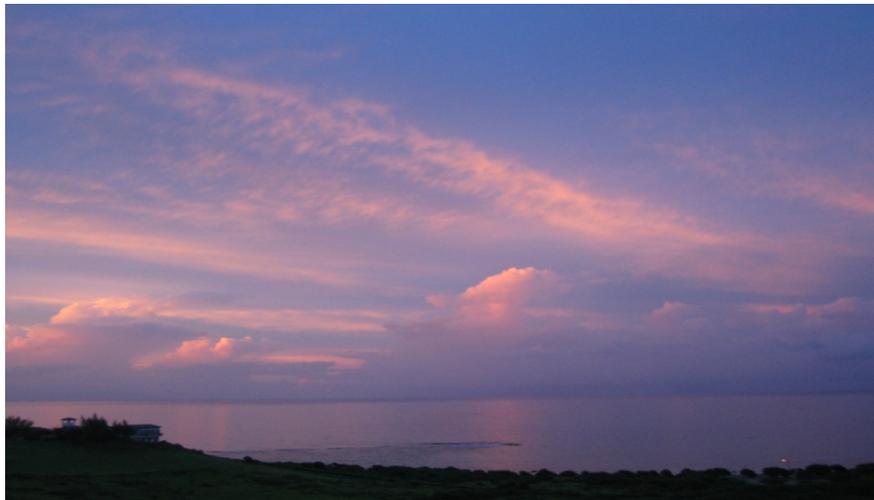




NOAA Technical Memorandum NMFS-SEFSC-593

Can an Island be a Fishing Community:
An Examination of St. Croix and its Fisheries



By

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Juan Agar

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southeast Fisheries Science Center
75 Virginia Beach Drive
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September 2009

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This report should be cited as follows:

Stoffle, Brent, James R. Waters, Susan Abbott-Jamieson, Shawn Kelley, David Grasso, Joy Freibaum, Susanne Koestner, Nate O'Meara, Sita Davis, Marissa Stekedee, and Juan Agar. 2009. Can an Island be a Fishing Community: An Examination of St. Croix and its Fisheries. NOAA Technical Memorandum NMFS-SEFSC-593, 57p.

This report will be posted on the SEFSC web site at URL: <http://www.sefsc.noaa.gov/>

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Executive Summary

This report focuses on the island, people and fisheries of St. Croix, United States Virgin Islands (USVI). In doing so it attempts to determine if the island, as a whole, can be considered a fishing community as defined by the Magnuson Stevens Fishery Conservation and Management Act. The reasoning for identifying the entire island as a single fishing community is based on local dependency on marine resources as well as the long cultural connection the people and island of St. Croix have with fishing. Among the factors examined to support this recommendation are residential patterns of those involved in all aspects of commercial fishing, fishing locations, locations of launching and landing sites, direct and indirect ties of commercial fishing to other local industries, and the fact that almost 100 percent of the marine resources harvested in St. Croix are landed, purchased and consumed in St. Croix. There is precedence for designating an island a fishing community as seen in the Western Pacific Region where the seven inhabited islands of the State of Hawaii and the United States territories of Guam, American Samoa, and the Northern Marianas are so designated.

The findings from this report are based on published literature, analysis of secondary data including U.S. Census data, and analysis of primary data collected by the authors that includes more than 100 systematically collected surveys and 150 additional interviews with St. Croix residents. Ethnographic methods were used to collect additional data. Both quantitative and qualitative analyses were used to analyze the data. The field research was carried out between 2004 and 2008 by NOAA Fisheries researchers.

Acknowledgements

We thank all of those individuals, groups, and institutions instrumental in the successful completion of this research effort. The first to thank are the people of St. Croix, especially the fishermen and their families, for their hospitality made our stay as enjoyable as it was informative. To Gerson “Nicky” Martinez, Gabrielito Ramos, Thomas Daly, Edward Schuster and Hector Rivera, there is no way we can thank you enough for your support throughout the research process. Each of you has made important contributions to the research.

Local participation is essential in this type of research and there are many community members that have devoted their time and knowledge as a way to improve conditions for all impacted during the transition to sustainable fisheries. Unfortunately while preparing to return for our second field visit we unexpectedly lost an integral part of what made the project successful. Before our arrival in 2005, Robert McAuliffe was helping make preparations for our public meeting with local fishermen when he had a heart attack. While Bob fought a strong fight, he unfortunately passed away. His passion to bring a voice to the local fishermen was laudable and in the end it can be said that he labored and died working for something he cared deeply about, the St. Croix fisheries. To Bob and his family --we thank you very much. In many ways the completion of this report is in honor of your years of effort to bring a voice to St. Croix fishermen and to developing a deeper understanding of the St. Croix fisheries.

There are two people from the United States Virgin Islands Department of Planning and Natural Resources (DPNR) who were extremely helpful to us during our

visits. To William “Toby” Tobias and Wes Toller, your assistance and knowledge were essential in the development and completion of this report.

We would also like to thank those who made it possible for us to complete this important research project. To all people associated with the Coral Reef Conservation Program, we thank you for recognizing the importance of this research. Financial support for this research was provided by grants from the NOAA Fisheries Service's National Standard 8 research program, NOAA’s Marine Fisheries Initiative (MARFIN) program, and NOAA’s Coral Reef Conservation Program.

Figure 1: Researchers and Local Contacts



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Introduction



Source: http://www.carambolabeach.com/st_croix.htm

St. Croix is the largest of the US Virgin Islands; it is approximately 20 miles long and is less than 85 square miles in area. Christiansted on the northern coast and Fredricksted on the western tip are the two major town centers. The island is geographically diverse, with flatlands on the southern coast, 1000 ft. mountains and rainforests in the northwest, and a virtual desert to the east, with a grassland abundant with cacti and flowers (www.carambolabeach.com).

Since becoming a US territory in 1917, the St. Croix economy has grown due to the development and construction of an oil refinery, an industrial plant, a rum production facility, and cattle farming, all predominantly located on the flat southern coast. Manufacturing and agriculture were and are today important industries. These industries coupled with an emerging tourism sector, an increasingly important source of revenue for

islanders, provide a majority of the job opportunities for residents (www.carambolabeach.com).

Fishing is and has always been an important activity for islanders. In addition to providing an income opportunity, it also provides food and leisure. Young and old, male and female, and regardless of one's ethnicity, people of every background fish. Fishing is an important part of the island's economy and the culture of the people who reside on the island.

Purpose of the Research

In 1996, the Magnuson Fishery Conservation and Management Act was re-authorized and amended by enactment of the Sustainable Fisheries Act (SFA), which also renamed it the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA (P.L. 94-265, as amended by P.L. 109-479) required regional fishery management councils to amend existing fishery management plans and, among other things, pay more attention to fishing communities. This report addresses this charge by examining St. Croix and its fishery, focusing on the socio-economic relationships and networks that comprise the fishery based on the MSA National Standard 8 (NS 8) definition of a fishing community.¹ Specifically, this report examines whether localized communities distributed across St. Croix, or if St. Croix as an island, better fit the NS 8 definition of a *fishing community*. In order to examine this question, it was necessary to

¹ Valdes-Pizzini, et al. are currently developing a report that focuses on the historical and contemporary development of St. Croix and its fisheries. The report highlights many important factors regarding participation in the local fisheries and the subsequent importance to the community at-large. While their research findings are separate from those in this report, the research effort was collaborative and was undertaken as an attempt to collect different kinds of data at different levels of specificity.

examine St. Croix's fisheries from a holistic perspective which included considering the relative social and economic importance of the local fisheries and other marine resources within the larger socio-economic and socio-political framework of the island. Researchers worked with a variety of stakeholders to understand how social and economic networks are directly and indirectly affected by the existence of the local fisheries.

Legislative Background on Fishing Communities

The Caribbean Region is comprised of many different cultures and ethnic groups that are involved to varying degrees with local marine resources and fishing (Khan 1998, Polo 2001, Stoffle 1986, Valdes-Pizzini in preparation). In the U.S. Virgin Islands (USVI), these relationships are often linked with the commercial, recreational and/or subsistence sectors. Reliance on these sectors often extends beyond those who are directly involved in the fisheries. On St. Croix, fisheries management and the overall health of the marine environment affect people differently based on both the degree of involvement and the specific ways people are tied to the resources as a means of providing income or sustenance for themselves, their families, and the local businesses that are dependent on fresh seafood. For this reason, recent research efforts have focused on community profiles as a primary research strategy for identifying and understanding the cultural similarities and differences that exist on the island, in addition to examining the level of dependency that local fishermen, and the society at large, have on the marine resources. This research clarifies our understanding of the socio-economic structure and perceived value of fishing so that fishery managers will better understand who or what

may be impacted by proposed management alternatives and the extent to which these alternatives differentially impact people linked to local fisheries.

Since the 1996 reauthorization of the MSA, there has been an increase in the amount of attention directed at understanding how local fishing communities are impacted by change from fishery management and by natural perturbations such as hurricanes. Much of this attention stems from the addition of NS 8 to the MSA in 1996. It is one of ten National Standards that guide fishery management, policy and research. NS 8 is unique in that it highlights the need to understand potential forces of change at a community level, recognizing the interconnectedness of fishing with other aspects of the community. In order to understand how fishing is interconnected with other aspects of the communities where these activities are carried out, one must first compare communities with significant involvement in commercial, recreational, and/or subsistence marine fishing and harvesting with those where this is not the case.

The ultimate goal of the National Standards is to guide management in the prevention of overfishing and rebuilding of overfished stocks. NS 8 focuses on the social and economic components of the Nation's fisheries and along with the National Environmental Policy Act (NEPA) is a driving force behind social and economic assessments which evaluate the impacts of proposed management alternatives. As stated in NS 8,

(C)onservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities. 16 U.S.C. 1802 §3 (17).

The establishment of new regulations must consider the cultural and social framework relevant to the fishery and any affected fishing community. In an effort to address these social and economic concerns, the MSA requires that all fishery management plans include a fishery impact statement. The fishery impact statement assesses, specifies and describes the likely impact of management alternatives on fishermen and fishing communities involved in the fishery whose management plan is under revision. The following is the definition of a fishing community as written in the MSA:

The term "fishing community" means a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community. 16 U.S.C. 1802 §3 (17).

The MSA defines a *fishing community* as a place-based entity, which is problematic for many communities throughout the continental United States (US). This is because the socio-economic networks associated with commercial and recreational fishing are often not limited to the physical boundaries of a place-based community. These networks can reach not only adjacent communities, but can cross state, regional, national and even international boundaries. This can be a problematic definition for US communities because the forces of gentrification and coastal development are causing many fishermen to relocate to areas outside of their local communities, usually further

inland, where housing is more affordable. So while they may fish out of the same places they always have, they may no longer reside there.

Another issue arises because no criteria were specified in the MSA with which to determine whether a community is substantially dependent or substantially engaged in fishing. However, the Socio-Cultural Practitioners Manual (Abbott-Jamieson and Clay, in preparation) identifies 23 indicators that can be used to assist in the evaluation of fishing communities. In the Pacific Northwest Region (Norman et al 2007), a quantitative model based on commercial catch data and other indicators was developed to determine each community's level of dependence or engagement in commercial fishing. This type of analysis is not applicable to the USVI because catch data of similar quality are not currently available. In addition, recreational and subsistence fishing are important parts of the island's fisheries and need to be considered when discussing community designation. These sectors were not considered when selecting the Northwest Region fishing communities.

The process of identifying a community as a *fishing community* can in many cases be a subjective process focusing as much on socio-cultural variables as fishery dependent variables. Allen (2009) describes the designation process in the Western Pacific Region. In 1998, the Western Pacific Regional Fishery Management Council (Council) proposed that each of the major island areas under its jurisdiction (Hawaii, Guam, American Samoa, and the Northern Mariana Islands) be identified as a *fishing community*. Their argument was:

In contrast to most US mainland residents, who have little contact with the marine environment, a large proportion of the people living in the Western Pacific region observe and interact daily with the ocean for food, income

and recreation...fishing also continues to contribute to the cultural integrity and social cohesion of island communities...In each island area within the region the residential distribution of individuals who are substantially dependent on or substantially engaged in the harvest or processing of fishery resources approximates the total population distribution. These individuals are not set apart...from island populations as a whole (Western Pacific Regional Fishery Management Council 1998, 52-53).

Based on this discussion, on April 19, 1999, the National Marine Fisheries Service (NMFS) approved the identification of American Samoa, the Northern Mariana Islands, and Guam as *fishing communities* (64 FR 19067), recognizing that an island or group of islands that contain diverse cities and towns could be a fishing community for the purpose of NS8. At that time NMFS rejected the characterization of the State of Hawaii as a fishing community because it was overly broad and encouraged the Council to identify fishing communities in Hawaii at smaller scales. NMFS recognized that there are cases in which an island may be designated as a community, but said the Council needed to have provided additional background and analysis to justify the designations and that “In the case of Hawaii, a more narrow categorization needs to be developed” (Allen 2009).

In 2002, the Council, supported by NOAA’s Pacific Islands Regional Office (PIRO) and the Pacific Islands Fisheries Science Center (PIFSC) proposed that each of the major inhabited islands of Hawaii (Niihau, Kauai, Oahu, Molokai, Maui, Lanai, and Hawaii) be defined as a fishing community for purposes of MSA. Their argument was based on the following perspective:

These findings indicate that fishing and related services and industries are important to all of Hawaii’s inhabited islands, that the social and economic cohesion of fishery participants is particularly strong at the

island level, and that fishing communities are best not distinguished according to fishery or gear type. The most logical unit of analysis for describing the community setting and assessing community-level impacts is the island (Western Pacific Regional Fishery Management Council 2002).

These designations were administrative rather than based on specific research findings warranting community designation. As Pooley (2003) describes, “the Decision Memo noted that the resulting definitions of fishing communities would be broad and perhaps overly-inclusive, but did not view that outcome as problematic, primarily because information at smaller scales for planning and policy development would be available in the future through ongoing Science Center research activities” (Pooley 2003). Since this decision, research on dependency and engagement in the fisheries has been conducted and two reports were developed that focus on American Samoa and Guam (Allen and Bartram 2008; Levine and Allen 2009).

Allen and Glazier (2005) provided additional interpretation of the NMFS rationale for approving the island definition of fishing communities for Hawaii:

1. ***Islands pose special challenges:*** *all residents live in coastal counties so there is not as a great a distinction between communities directly on the coast and those farther away; there is a ubiquitous connection to marine ecosystems and associated cultures; and social and commercial networks are more confined on islands.*
2. ***Precedent of American Samoa, Guam, CNMI designation:*** *once NMFS approved of these places as fishing communities, the validity of the island approach had been identified.*
3. ***Cultural appropriateness:*** *In Hawaii, there is less of a distinction between sources of engagement and dependence than in some other places, due in part to the mixing of commercial, recreational, and subsistence fishing. In addition, it was not viewed as appropriate to “pit” one community against another to see which is more substantially engaged or dependent on fishing activity to meet social and economic needs, and resulting distinctions may be largely analytical artifacts rather than real or meaningful differences.*
4. ***Lack of negative consequences:*** *During the conference call, participants discussed what it actually meant to be designated as a fishing community (or to be*

- left off the list). The consensus appeared to be that it did not mean all that much—all the Act required was “consideration” of fishing communities and did not target them for special treatment, mitigation activities, or other tangible management efforts. Therefore, even if the island scale was broader than desirable, and in some cases not consistent with many peoples’ definition of a “community” the results would not be harmful.*
5. ***Planned research at the sub-community scale:*** *As described above, concerns about the overly-broad island scale were addressed through Center promises to conduct research on dependency and engagement at sub-island scales.*
 6. ***Evolving ecosystem-based approach to fisheries management:*** *Given NOAA Fisheries’ transition to this management approach, it makes sense to be more inclusive in a definition of place, lest some critical resources and connections be missed in an overly-narrow delineation of fishing community. (Allen and Glazier 2005)*

In many ways the rationale for island-wide designation of St. Croix as a fishing community mirrors the rationale for island-wide community designation in the Western Pacific Region. This report includes the results of recent research conducted on St. Croix which documents some of the critical ways in which the island’s residents are tied to and dependent on the fishery and the marine resources. Throughout this document, a description of the St. Croix fishery and its socio-economic ties build an argument that, when compared with the justifications for designation in the Western Pacific Region, address the notion of island based community designation and provides cases of islands being designated and a rationale for recommendation of St. Croix as a *fishing community*.

As Allen (2009) addresses in his unpublished document and must be reiterated here, there is no legal documentation or formal discussion explaining what designation could mean to a community. During the course of this research some have pondered whether designation as a *fishing community* could signify an increase in consultation or that a regulation could be tailored to the special circumstances of a fishing community. As of yet this has not been determined, but as one local and outspoken representative of the local fisheries suggests, “it probably can’t do us any harm to push for it (designation)

and then see where that leads.” Although there is no formal statement that defines the value of research to profile fishing communities, it can benefit local stakeholders as well as policy decision makers by providing information that enables researchers and decision makers the ability to understand the level to which stakeholders are tied to the marine environment and the ways in which they may be impacted by future management actions. In the case of the St. Croix research, we examined the fishery and its socio-economic linkages within the society to assess the level to which the island residents, including local fishermen, are tied to marine resources.

Research Methods

Our research in St. Croix was designed to collect information regarding the local fisheries and fishermen on an island-wide level, including all geographic areas where fishermen and those tied to the local fisheries reside. We evaluated the manner in which individual and group participation affected the local fisheries while developing a deeper understanding of the ties that bind fishermen to socio-economic networks across the island. This was done in an effort to determine how the reliance on the local fisheries and residence patterns fit the MSA’s definition of a place-based community.

To accomplish this task we examined a specific set of indicators which measure social, cultural and economic ties to commercial, recreational, and subsistence fishing. This effort focused on indicators related to the human dimensions of fishing, and attempted to determine the ways in which a community might qualify as a *fishing community*, while at the same time developing a realistic approach for completing the necessary inquiries, as time and money are almost always limitations in conducting

research. While many of the indicators that we discuss are quantitative in nature, the process of evaluating and identifying *fishing communities* is subjective.

The data for these indicators are in part based on a subset of the data collected for a larger research effort to profile the St. Croix fisheries and assess the effectiveness of regional marine protected areas (see Appendix 1). Not all of the survey questions were germane to this research about St. Croix as a fishing community for MSA purposes. However, the effort to profile the St. Croix fisheries examined a number of variables that described the local fisheries and identified linkages between the local fisheries and other aspects of Cruzan society. These variables included: 1) the reported landings and value of the landings between 1975 and 2006; 2) the species targeted by local fishermen; 3) fishing launching and landing sites; 4) residence patterns; 5) fishing effort, employment and income; 6) the difficulty in finding employment outside the fisheries; and 7) catch disposition. The examination of community linkages focused on the following survey questions: 1) where vessels were built; 2) where vessels are serviced; 3) where fishing gear is purchased; 4) where electronics/navigational equipment is purchased; and 5) where bait is purchased. In each of these categories there is a subsequent discussion that lends itself to further exploration of internal and external socio-economic relationships. Each of these categories offers important information about local dependency on and engagement in the fisheries as well as highlighting the socio-economic linkages that exist between the fisheries and the other island residents.

In addition to the survey data, secondary source data were assembled (both fishery dependent and independent), including data about fishery landings and revenue from NOAA Fisheries and the USVI Department of Planning and Natural Resources, as

well as socio-demographic data from the U.S. Census Bureau. Another important source of secondary data includes previously published reports and articles that relate to St. Croix and the St. Croix fisheries. Information from these reports is incorporated throughout this study.

The study and identification of fishing community requires an in-depth examination into a variety of issues and kinds of data. In addition to survey and secondary source data, we collected primary source data with ethnographic research methods (see Bernard 2002). These methods included formal and informal interviews with fishermen and other local stakeholders, including multiple iterative interviews with individuals deemed to be “key informants,” in an attempt to holistically understand the historic and contemporary importance of fishing and fishery resources to local people and the community at-large.² In addition, researchers participated in fishing trips to learn about fishermen's work experiences firsthand as well as spending time with fishermen as they marketed their catch (see Figure 2).

² See Valdes-Pizzini et al. (report in preparation) for a more in-depth discussion of history and contemporary cultural components of St. Croix Fisheries.

Figure 2: NOAA researcher interviewing local fisherman



Key sources for this report are the recent research conducted by Valdes-Pizzini and his research team in 2004, and by Stoffle and his research teams in 2004, 2005, 2006, and 2008. During his research, Valdes-Pizzini and his team conducted 47 interviews from all sectors of Cruzan society involved in fishing and conservation. The stakeholder categories represented in the interviews are fishermen, government officials involved in resource management, SCUBA diving operators, sport and recreational fishermen, restaurant owners, and fish market workers, including dealers and cleaners. Following a similar strategy, Stoffle and his research teams conducted 84 informal interviews with 71 people in 2004, and returned the following year to conduct another 25 informal interviews and administer a formal survey to 105 people. The sample from the formal survey is shown in Table 1 – see Appendix 1 for the survey.

Table 1: Breakdown of survey respondents

Stakeholder Groups	# Surveyed	% of Group Population
Commercial Fishermen	94	45%
Recreational Fishermen (also holding commercial licenses)	2	Unknown
Dive Shop Owners/operators	9	90%
Total	105	

The individuals surveyed were composed of two different samples. Working from a list of licensed commercial fishermen, 64 fishermen were selected randomly and interviewed. This constituted the first sample. In an effort to increase sample size due to the difficulty in locating some of the fishermen on the list, an additional 32 fishermen were sampled opportunistically. This was the second sample. Together the two samples achieved a total sample of 45% of St. Croix’s active commercial fishermen. In addition, two recreational fishermen were sampled who held commercial licenses and sold portions of their catch. One of the recreational fishermen is a charter boat operator who at the time was said to be the only legal charter operation on the island. The other recreational fisherman fishes for pleasure and food, yet when there is a “good” catch will offset some of the costs by selling some of what was landed. Because dive shop owners and operators are intimately tied to marine resources and, for some, to the commercial dive fishery, it was also important to incorporate their perspectives. Owners and operators from nine of the ten operational dive shops were interviewed.

Interviews and surveys were conducted in both Spanish and English, depending on the language people felt most comfortable using. A total of 96 surveys were administered to individuals with commercial licenses, with an equal number of surveys conducted in English and Spanish (48 each). In addition, surveys conducted with dive

shop owners and recreational fishermen who also hold a commercial license were all conducted in English (N = 11). Future research efforts should be sure to include bilingual research teams to ensure that people are not excluded from participation based on a preference to communicate in Spanish.

The identification of a fishing community is not solely based on the existence of a vibrant and productive commercial fishery. In fact the presence or dominance of a recreational and/or subsistence fishery indicates other ties to fishing and fishery resources that exist in the community and further highlights local dependency and engagement on marine resources. For this reason researchers also explored the involvement of recreational fishermen and those that fish primarily for food. However, the formal survey did not include subsistence and private recreational fishermen because there was no listing of all potential respondents from which to draw a sample, and time limited the amount of effort that could be spent to identify and locate these undocumented groups of fishermen. While subsistence and private recreational fishermen were not included in the formal survey in 2005, many were contacted as part of the informal interview process in 2004, 2005, 2006, and 2008. A method for systematically sampling subsistence and private recreational fishermen needs to be developed for future research. Systematically studying these segments of the population will improve our understanding of the importance of fishing on the island.

In 2006 and 2008, researchers returned to St. Croix and conducted additional informal interviews with local residents and fishermen regarding changes in the fishery and the island economy resulting from the decline of the US economy in 2008 and the subsequent reduction in tourism and other economic activities, as well as the impact of

increased gas prices and costs of living in a time of increasing unemployment on the island. This information combined with the formal survey information assists in developing an understanding of the ways in which island residents responded to various disruptions in economic growth and prosperity.

Description of the St. Croix Commercial Fisheries

In order to determine whether a community can be classified as a *fishing community* by MSA standards, it is necessary to identify and understand aspects of the fishery that create, foster and maintain socio-economic networks among fishermen and island residents. Often, these networks extend outside of the fisheries and directly and indirectly impact other members of the community. Data collected between 2004 and 2008 support the notion that an island can potentially be classified as a *fishing community* like those in the Western Pacific Islands Region due to the strong historic and contemporary socio-cultural and economic ties to the fishery on clearly bounded geographical entities like islands.

The St. Croix fishery³ can be described as a multi-gear, multi-species fishery. Participants come from an array of ethnic backgrounds. Most are Hispanic and West Indian, but it also includes persons of other ethnic backgrounds. There is a long history of fishing on the island, and migrant groups have either adopted or adapted their fishing methods to fit in with the predominant methods of fishing. Fishermen normally use small fiberglass boats under 24 feet in length, and have motors that are generally no larger than 100hp. About 48% are Hispanic and 42% are classified as Black (Valdes-Pizzini et al. in preparation). Individuals placed themselves within these two primary categories.

³ See Valdes Pizzini et al. for in-depth description, currently in preparation.

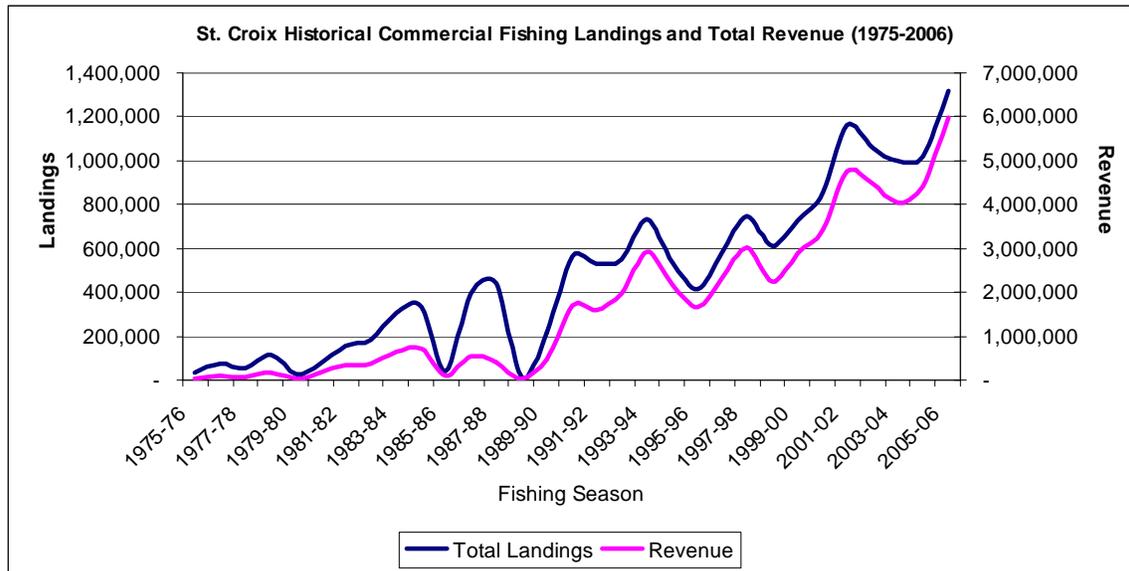
In 2005 there were approximately 230 commercial licenses. In 2008 the number had decreased to approximately 166. This is based on a list of commercial fishing licenses provided to the researchers from the USVI DPNR in 2005 and 2008. The decrease is attributed to the fact that a moratorium on new licenses has been in place for about eight years, and since its implementation the fishery has been experiencing an “aging out” process. Some participants have died, and others have become too sick to fish or have simply reached an age where they no longer are able or want to fish. There is, however, some redistribution of licenses among family members, and there are cases of people “sharing” their commercial license with others who wish to engage in fishing.⁴ This means that though the official number of licenses may be decreasing, the decrease may not be as large as it appears because of the increase in license sharing arrangements and undocumented crew/helpers. Our survey data indicate that fishermen use approximately 1.5 crew members per trip, but the types of trip often vary and so too do the numbers of individuals.

There is little doubt that the local fisheries generate economic benefits for their participants and the community at-large. Revenue generated by local fishermen sustains individual and familial fishery enterprises in addition to providing for non-fishery specific items, such as housing, education, food and entertainment. Because of their efforts, tourists and local residents can buy fresh seafood, and the income generated from these sales support a variety of local businesses directly and indirectly associated with the fishery, such as restaurants, gas stations, mechanics and dive shops. What makes this

⁴ This “sharing” occurs among those who purchase commercial gear yet have no commercial license. In these instances they partner with a licensed fisherman and work the gear. The commercial fisherman is often compensated monetarily for the use of the boat/license and time/effort. The money is derived from the selling of the fish and the fee is often negotiated based on the success of the trip.

unique is that the money made and spent supports aspects of Cruzan society that are primarily located within the physical boundaries of the island, as opposed to many examples of US communities where money exits the real or imagined boundaries of a community.

Figure 3: Reported landings and revenue for St. Croix from 1975 to 2006, USVI Department of Fish and Wildlife.



Between 1975 and 2006, commercial landings ranged from a low of approximately 18,200 pounds worth \$24,300 in 1975 to a high of 1,230,700 pounds worth nearly \$6,496,000 in 2006. In 1975 the average value of a pound of fish was \$1.34 compared to 2006 when the average value of a pound of fish was \$5.29. In 2006 dollars, the 1975 value is \$5.03, meaning that the price per pound after adjusting for inflation has changed relatively little over 30 years⁵. Over the last five years the price for fish has

⁵ Average annual prices were adjusted for inflation with the consumer price index for all urban consumers (series CUSR0000SAO) available from the U.S. Department of Labor, Bureau of Labor Statistics at <http://www.bls.gov/data/>. The adjustment factor for inflation is 3.7537 based on index values of 54.0 for July 1975 and 202.7 for July 2006 (base period=1982-1984).

gone up very little, in some cases only a dollar per pound. Fishermen stated that it would be wrong to take something so important to local people and price it in a way that they could no longer afford to enjoy it and share it among their friends and family. Even in the face of incredibly high gas prices (in the summer of 2008 fuel was around \$4 per gallon) the local fishermen did not raise the price of fish to offset their increased operating cost.

While 2006 data indicate that fishermen received almost six and a half million dollars in revenue, the overall impact of the revenue could be greater in a place such as St. Croix as compared to other US coastal communities. In comparison with other US coastal communities where fishing occurs, the revenue generated in St. Croix has a greater likelihood of circulating within its various sectors of society and directly and indirectly affecting the local economy as a whole, in large part due to the physical boundaries associated with being an island. This is not to say that St. Croix has a closed economy or closed society, for in fact it would be virtually impossible to find such societies in today's global economy. However, in comparison with other US coastal communities, the physical boundaries of those communities are less restrictive in terms of travel and interaction, making it more likely that the revenue generated actually exits the physical boundary of that community. For Cruzans, many needed goods and services exist within the boundaries of the island, and even when items are imported, these items go to maintaining revenue and employment opportunities for local people.

Revenue generated has an impact on opportunities for employment and vocational training, as the greater the economic success the greater the need for additional help/crew. The species targeted by local fishermen often cater to the needs of restaurants

that service locals as well as those that predominantly service tourists. In many instances, restaurants are able to provide a fresh, high quality product without having to rely on imports that are often frozen. This arrangement creates a constant demand for local seafood which produces greater stability for the fishermen because many of them develop relationships with individual restaurants to supply fresh product.

While buying fish at the La Reine fish market, a local resident stated that,

(W)e buy regular fish (pot fish), and sometimes we get something special. But look at the lobster and conch they catch. We love it, but we don't eat it everyday...but you know who does?...Check a menu in offseason and conch and lobster is still a specialty. People who come here want it. Tourists come for fresh conch like it was the Bahamas. They also know where to come for the best lobster...they know it....We don't have (cruise) ships to bring 'em, but ask any tourist on vacation why they come to St. Croix, and one reason is that they love the fresh seafood.

There is an interesting connection between the fisheries and the tourism industry. The preceding comment highlights a perception held by local fishermen and supported by informal interviews with tourists. One of the main reasons why people come to St. Croix as opposed to other Caribbean locales (in addition to the friendliness of the people) is being able to enjoy low priced, high quality seafood. This illustrates one way in which marine resources are tied to various aspects of the island's economy. Fishermen often talk about the idea that the tourism sector would be worse off if not for the service that they provide, and a change in the provision of fresh seafood would negatively affect the island's economy as a whole. Local fishermen question whether people would still be as satisfied with their tourist experience if the lobster they were eating was from Miami,

Florida, or if the conch was from Latin America. The inference is that tourists may be less likely to come if they could not enjoy fresh, local seafood.

Species Targeted

In examining the types of species targeted, we are able to identify those species that are sold and consumed by locals and restaurants that primarily serve locals, as opposed to those species that are consumed by tourists and restaurants that primarily service tourists. By doing this a better understanding of local dependency on fishery resources can be developed and utilized when discussing the impact of any action or activity which might affect access to different species.

Local fishermen employ multiple gear strategies to target a wide variety of species. Snappers were reported to be the most commonly targeted species because they are the preferred species for consumption, both by locals and tourists that frequent restaurants. Snappers are caught by all of the five major gear categories: hook and line, traps, nets, SCUBA/freediving–spearfishing, and lobster/conch harvesting. Also, the bottom habitat is ideal for a reef fishery, especially one that supports many types of desired snappers, such as yellowtail, red and mutton (virgin) snappers. Parrotfish is the second most common species that fishermen target for similar reasons, even though it is a species primarily consumed by locals and served in restaurants that cater to locals rather than tourists. It is not targeted by hook and line fishermen.

The most prized fish species targeted by commercial fishermen are tuna and dolphin (*mahi mahi*) because they are big money makers that are sold primarily to restaurants that cater to tourists. These species sell for two to four more dollars per

pound than potfish. Grunts round out the most popular fish species targeted, likely due to the fact that they are caught using the same methods as snappers, and that their bodies and meat resemble snapper species when cooked. They are a popular food fish for local people because they are affordable at between two and four dollars per pound.

Conch and lobster are the most popular non-fish species, and are two of the most economically important species for the commercial fisheries. Conch is purchased by restaurants and locals, while lobster is primarily purchased by restaurants and hotels that cater to tourists. Lobster does not currently have a season and can be targeted and sold throughout the year. On the other hand, conch cannot be caught and landed between July 1st and September 30th.

Figure 4: A cooler of potfish (several varieties of reef fish mostly consumed by locals)



There is little doubt as to the most popular species for locals who frequent the La Reine market, and these are called reef fish or potfish. Almost all gear types employed by Cruzan fishermen target these species. Observations at the local markets support the

claim that trap fishermen target yellowtail snapper, and other fishermen, such as net and spearfishermen, target a variety of commercially lucrative species (note that the gill net fishery has been closed since 2008). Examine a cooler of fish at the La Reine market and a variety of reef species are present, including angelfish, squirrelfish, trunk fish, tangs, and coney (aka “butterfish”). These are generally called potfish (meaning that “they all go in the pot”) and are sold as a part of an aggregate sale not segregated from one another. It is not uncommon for locals to turn away a seven pound mutton snapper and buy seven one pound squirrel fish, “blue” or “red” parrotfish, angelfish, or grunts. The seven pounds of potfish feed a larger number of people and are said to be the preferred species of local consumers.

The difference between the markets for species sold to local restaurants compared to local community members is small, for in many cases they share a desire for similar species, especially for conch and potfish. But, when it comes to “preferred” fish for restaurants that cater to tourists, the difference is often as clear as the distinction between reef and pelagic species. This is indicated by the relationship between the client and the location of purchase. Tourists mainly buy seafood at high end restaurants, while locals buy seafood at the La Reine market, and from individual fishermen and local restaurants. It needs to be pointed out that the majority of local restaurants and eateries on the island do not cater to tourists; they cater to locals. This is important to note for much of the local fresh seafood purchased for the “local” restaurants reflects the preferences of the local population who not only come to the La Reine market to buy something for the dinner table but also go to restaurants for lunch or dinner and expect to see the same desired species because of both price and culinary preference.

Launching/ Landing Sites

Figure 5: Launching and Landing Sites in Relation to Markets



Improved roads and facilities have allowed fishermen to diversify their efforts as well as fishing locations. Many fishermen are no longer subject to fishing out of a specific location and instead fish out of a variety of locations based on their ability to trailer their boats (see Figure 5). The fact that fishermen utilize multiple launching/landing sites suggests that they have consciously adapted their fishing practices and locations based on a variety of variables including weather conditions. The location where one fishes is often a result of careful deliberation of market pressure/demand, weather and safety. As a local spearfisherman stated,

Look, you gotta go where the wind doesn't blow. (For us) you can't go north 'cause there ain't much ground there to work 'cause of the drop off; so you have to look for clear water to the south, east and northeast. If we can't see, we can't fish or lobster. We use the island to block the wind and help our visibility. So sometimes I go out of Altoona Lagoon and sometimes out of Molasses (Pier—to the south). That's why it's good we don't have our boats in only one place (marina). We have to be able to move around otherwise we might have to go much further by sea than we need to, which can be dangerous if weather is rough.

Fishermen report that there are three primary locations where they launch and land their boats: Altoona Lagoon (aka Augusta Landing Site); Molasses Dock (aka Krauss Lagoon); and Frederiksted. In addition to these three sites, fishermen identified six more locations around the island that are used for landing catch. These findings support the statement made by the local spearfisherman and supported by others who trap and line fish. By trailering their boats, they have the necessary flexibility to react to weather conditions as well as make on-the-spot determinations about the types of species to target, the specific areas to fish and the gear strategy to employ.

The landscape includes a number of launching/landing ramps that are used by fishermen to sell fish and/or to simply congregate as a part of daily social activities. Frederiksted, a center of fishing activity in the past, is today a place where only a few fish market transactions are made. Fishermen use the Frederiksted pier and ramp to land their fish, but prefer to sell fish somewhere else or to the few customers that still wait for their arrival. Often, the market is either empty or is a location where small groups of men congregate to socialize.

It is important to understand where people launch their boats and land their catch because it is part of understanding a community's engagement and dependency on fishery

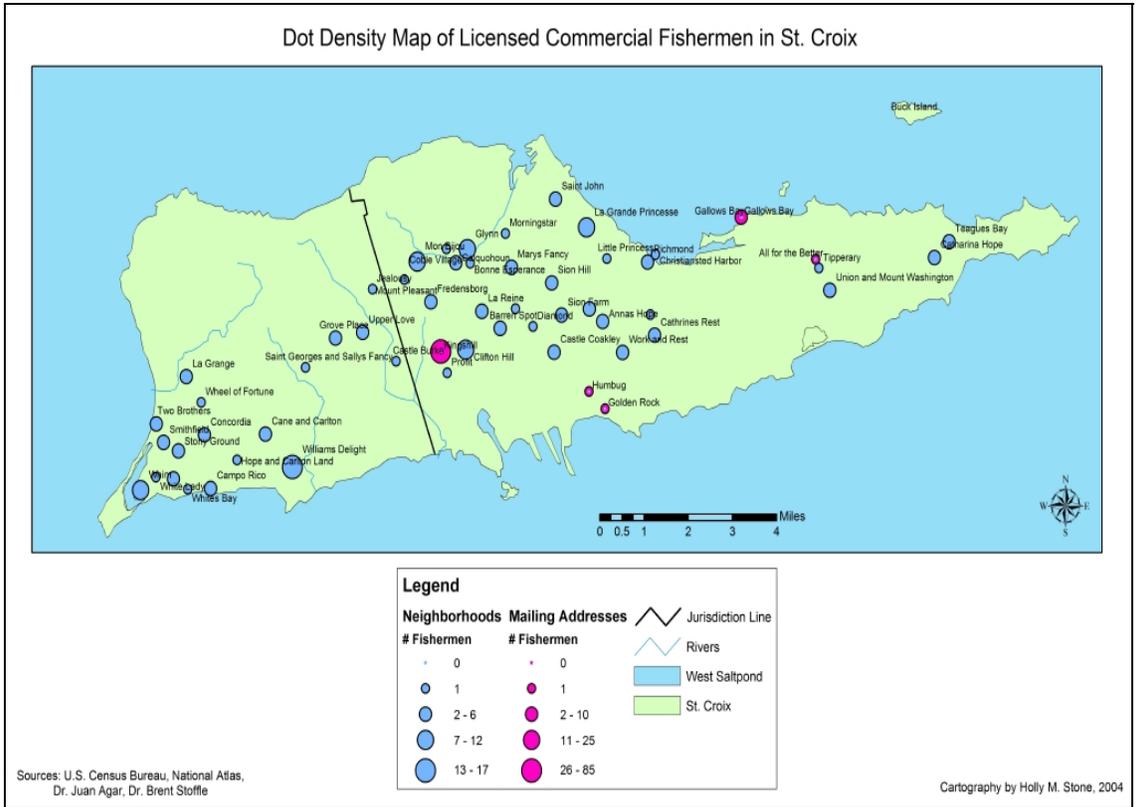
resources. Launching and landing locations provide access to fishing grounds. If highly frequented landing sites are closed to build a new hotel, resort, or facility for some other use, then it might cost much more for extra fuel to access traditional fishing grounds from other locations, or these grounds might not be accessible at all because of the added safety risks of traveling to fishing grounds from other sites. It would also disrupt ongoing, valued social relations among fishermen using existing launch sites.

Figure 6: Boat being brought to Molasses Dock



Fishermen’s Residence Patterns

Figure 7: Residence Patterns



In addition to the benefit of improved access to launching/landing sites based on improved road infrastructure, fishermen have gained access to areas which in the past may have not been deemed suitable for residence, either for a lack of services or the distance to launching areas. Improved roads have led to improved opportunities for housing developments further inshore, making areas once perceived to be out of the way, increasingly accessible.

Figure 7 shows that fishermen’s residences are not clustered around launching and landing sites. The residence density map demonstrates that only a few fishermen

reside in estates and neighborhoods located in coastal areas. Most are located along an imaginary diagonal line from the southwest to the northeast, coinciding with the route of the Centerline Road and other major thoroughfares, and falling in between the industrial areas of the south and the mountainous region running across the north coast. These housing locations arose for several reasons, including the process of homesteading that relocated fishers from poor and economically depressed urban communities or housing complexes to other public and private housing. The residential pattern may also represent decisions made by fishermen to move to newly developed areas or other preferred locations.

In the past there may have been transportation related issues that separated areas within the island and making individual communities more prevalent. However with the creation of an efficient transportation infrastructure, specifically the creation of improved roads and increased access to coastal launching areas, fishermen are no longer subject to keeping vessels in specific coastal locales and instead can now keep vessels at their own private locations and on a daily basis select the best places for launching their boats and landing their catch.

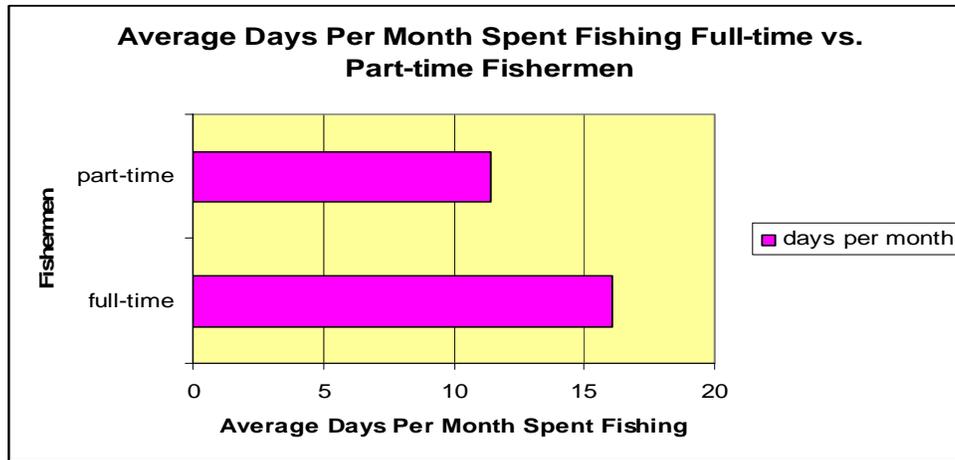
Fishermen and researchers discussed the MSA's definition of a *fishing community* throughout this research. Designating a specific individual area as a place-based community did not seem to make sense to the local fishermen due to the fact that people are currently dispersed all over the island. As one fisherman stated,

Why should we be confined to where we live in order to be considered a fishing community? We can't afford the houses on the beach. Many of us may have started in one place or another, and there may have been more of us (fishermen) there at the time...you know, some of us did well and bought and built homes in other areas. Should we be punished for this, I

mean because we left to build something better for our families. We fishermen live all over this island and fish every side, 'cause you know weather tells us where's the best place to go... So if it's bad up north, we go south, bad on the east, we go west. The island blocks the weather for us, especially us divers.

This is an important statement because it suggests that the MSA definition of a *fishing community* as a place-based entity could be applied to entire smaller islands where fishing is culturally central as well as economically important, as has been done for the islands in the Western Pacific Region discussed earlier in this report. These are places where fishing is an important part of local economic activity with direct and indirect ties to other aspects of society, as well as being an integral part of the cultural patterns of the local people and a reflection of how people perceive themselves. It should be remembered that St. Croix's population is only approximately 55,000 people. Smaller in population than many coastal communities in the continental US, even though geographically more dispersed than some, the social, economic and cultural relationships between Cruzans and their local fisheries may be more interconnected than in many continental (US) coastal communities.

Figure 8: Time Spent Fishing; Full-Time versus Part-Time (N=96)



Fishermen were asked to classify themselves either as full-time or part-time. Full-time fishermen fish roughly 53% of the days available for a month, whereas part-time fishermen fish 40% of the available fishing days, a difference of 13% or about one day per week. This indicates that full time fishermen are certainly more engaged in fishing, yet not to be overlooked is the fact that out of every 10 days, part time fishermen fish four.

Fishermen who were surveyed spend the greatest number of days fishing between October and April. This is not surprising considering that the region is heavily impacted by hurricane activity from June through October. Even storms that do not directly hit the island still affect the fishermen’s ability to fish due to the increase in wind and wave activity. The peak of the observed seasonal distribution of fishing effort also correlates with the peak of the tourism/vacation season. This suggests that fishing effort also may

be market driven by vacation and second home tourists impacting the supply/demand relationship for prized, high value species.

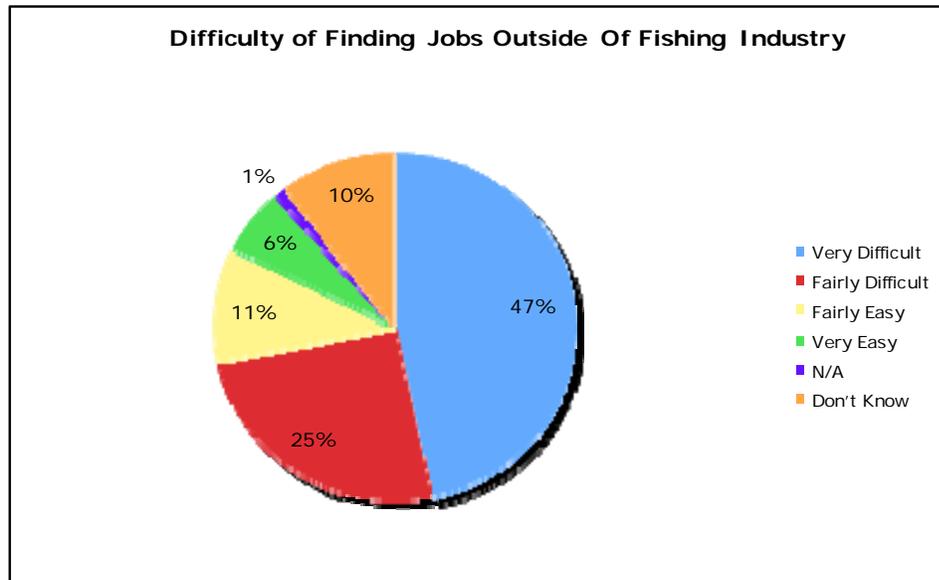
In 2005, fishermen were asked to assess their household well-being today versus five years ago. While 23% stated that there was some improvement in their financial well being and 33% said that things remained the same, 42% stated that things had gotten worse. Many fishermen stated that regulations have impacted their well being, especially the increase in the number of closures (such as the Buck Island expansion) coupled with the fact that the whole economy itself has experienced difficult times. Fishermen and locals stated that after the attacks of 9/11 tourism had dropped off, resulting in restaurants and businesses that previously were open year round now operating on a seasonal basis. Interviews with local service employees, such as bartenders, chefs, cooks and cleaning crew, support this observation.

During these months (summer), we often all know what is open, on what night and where we will go (for drinks or dinner). We support them (other waiters and bartenders) and they in turn come and support us; one night here and one there. If we didn't have that one good night of our friends giving us tips, it could be tough to make a living doing this during the summer. We have to look out for each other (2005 Local Bartender at Off The Wall)

This is an interesting comment for it sheds light on a whole other industry with links to the fisheries. Small bars and restaurants often pride themselves on local seafood products, especially conch. Yet, when summer arrives and tourism is slow, so too is the amount of seafood that they need to purchase. Incomes for fishermen and employees in the tourism industry depend on seasonal and long-term trends in overall market forces. With unemployment being already high on the island and the percentage of people who

live below the poverty line exceeding the US national average, there are not a lot of other kinds of wage earning activities for fishermen, regardless of their skill sets.

Figure 9: Difficulty Finding Jobs Outside of Fishing (N=96)



An important socio-economic indicator of the importance of the local fishery is couched in the question of how difficult it is to find employment outside of fishing. For many West Indians and Caribbean peoples, occupational multiplicity is a strategy used to create greater economic security to make up for shortcomings in other economic sectors (see Comitas and Lowenthal 1973, Stoffle 2001, Stoffle and Stoffle 2007). This observed strategy is likely reflected in the sentiment reported by more than 70% of the commercial fishermen that it is at least “fairly difficult” to find employment outside of fishing.

The majority of fishermen surveyed in 2005, about 72%, disclosed that they are the only members of their households that earn income from fishing. Almost 50% of the

fishermen responded that they and their household members have no jobs other than fishing. This refers to the entire household, including the fishermen, their wives, their children, and any other household member. For some fishermen the “other household members” that sometimes earn money from fishing include sons, cousins, father or uncles.

A local commercial fisherman/diver spoke about how he and his son are now working together, whereas in the past he fished with his brother and a friend.

You know schools here are not for everybody. He got ok grades (his son) but he says he just can't take it anymore. He held out until he turned 16 and then quit. What can his mother and I do. He says he wants to learn a trade like welding. For now though he is working with me running the boat while I dive...I have always had him around me when I fish. He really seems to like to dive and spear (fish). I don't really want this life for him, but it is a good honest way to make a living. I had hoped he would go to school and go to college, but there is nothing wrong with being a welder or a fisherman. They are both good jobs....yeah I am glad I taught him to fish. I know I can trust him and he does a good job for me. Sure he is only 16 and still makes mistakes, but overall he's a good kid and I am proud of him. (2006 Local diver)

For many on the island, especially young boys, fishing is an opportunity to make a living or at least a good wage until they figure out what direction they will go in their lives. Many of St. Croix's youth --especially boys-- report being frustrated. Some of this frustration among the younger males may be a reflection of problems facing educators and the educational system as a whole. The educational system in St. Croix is in dire straits, with extremely high drop-out rates and violence. Less than 30% of the teachers were accredited in 2005.⁶ With fewer than 50% of the population achieving a high school diploma, some argue that this makes it even more essential for a vibrant fishery to

⁶www.virginislandsdailynews.com/index.pl/article_archive: 47 Public School Teachers Certified: Number Falls Far Short of Goal, Aesha Duval, May 23, 2005

exist, for it provides not only an opportunity for employment and a chance to learn a skill, but in addition provides mentoring for young men and a means of sustenance for families. This role for fisheries may be increasingly important because of a real or perceived outlook that there may not be many other productive legal opportunities provided for this group of youth.

While the part-time fishermen's households (56%) do have more non-fishing jobs than full-time fishermen's households (52%), the slight difference between the two is not unexpected due to the necessity to be flexible in one's work schedule if one fishes. One cannot plan to fish a predetermined number of days per week due to uncertainties about weather conditions and local market demands for seafood. One can only hope and plan fishing trips based on previous seasonal experiences and the strength of existing socio-economic relationships, for example, having friends who work in restaurants and calls from buyers for a specified amount of a certain type of seafood.

As one Frederiksted fisherman stated,

(F)or many of we, it is all the real money that come. Some can get a piece here and there at some other job, but I can't stop. Me 'ave a family to care for, old and young. How I do that if I got no fishin' to bring food and money? People count on me to bring fish and I count on them to take care of other t'ings. It's a real partnership.

Some of the part-time fishermen saw the writing on the wall when they purchased a commercial license before the 2001 license moratorium was put into place. As one fisherman stated,

I knew that right now I wasn't going to make my living off of fishing. I knew I could count on it to provide extra income if things got bad for us. But the main point of keeping my license was to give me a chance to make money in my retirement and fish on the weekends to help my kids pay for things they needed. Cruzan people go to the sea to help, whether it is for

food or money. It's something we know...count on. That's why I keep my license even though right now I don't use it...I know I will need it in the future. I dream of a day when my son and I can go fish and make a little money. I hope he won't need it, but I am sure that I will. And, what happens if I can't fish, at least I can give it (the license) to him to fish for me...I know plenty people that come from PR (Puerto Rico) or Vieques to renew their license, visit family and go home... Why?...They want to have the chance to fish tomorrow if things go bad. (2005 Local Cruzan Resident/Community Member)

Fishing as an occupation is the main source of income for the majority of fishing households, and the difficulty of finding other employment in response to a decline in fishing opportunities or regulation is a significant problem. It highlights a perceived vulnerability fishermen have to fisheries regulations. As one local fisherman stated,

I have sat up at night thinking about your various regulations on the fisheries. And, while I know we must be regulated in order to protect the fish and the fishermen, I just don't understand your choices of how to do it. I lay in bed last night wondering if I could rob a bank, could I get away with it. Seriously, and if I got shot but got my family the money would it be worth it. I don't know what I am to do if you continue to close me out of certain fisheries...We have to know how to do a little of everything in order to survive as fishermen, but I can't go ask for a job as a mechanic or carpenter because I can turn a screw or hammer a nail and still make what I do compared to the money I make fishing...Where does everything I learned about the sea go if I can't use it and pass it on to the next?...I try to help and show people who come here to study the fish that they need to see the ocean like we fishermen do, but they just don't get it.

Tom Daley, an outspoken fisherman and a man who carries a great deal of respect within the local USVI fishing community, explained his tie to the fisheries.

When I lost my boat, I didn't know what to do. The Government (US) was going to help me get restarted but at an interest rate that would have killed me. Where did the Government go when I needed help? So I put a mortgage on my house so that I could keep fishing and take care of my responsibilities. If I lose more fishing ground and people tell me I can't

fish for those that I know are there and are in great numbers, they will come and take my boat...And, then they will come and take my house. I fish, it is who I am, it is how I have taken care of my family and what can I do if it is gone? Nobody is going to give me a retirement fund. Nobody is going to pay my debt....I am a fisherman of St. Croix. I am the food on your table and in your restaurant. We fishermen are the providers of food for the island. Take us away and all you have is a lot of people on welfare. As times get tough people know that they can count on the sea to provide, as it always has been...We don't mind not being rich, we love the sea and what we do...You (Government) make us feel like we are criminals for trying to survive. We know regulations are needed, but let's sit together and talk about a way we can do it to benefit all, we. Don't just come here and say this is the best for the fish. We know, because we are out there everyday....We are the true conservationists, because we need it for the future, you don't. If I don't make it last how can I take care of my family, how can I repay what I have invested? (2005 Daly; personal interview)

These fishermen perceive that collaborative decisions must be made in order to protect the future of their profession and the species. Fishermen and other stakeholders, such as recreational fishermen, dive shop owners and operators, perceive that they are all tied to a healthy marine ecosystem and that the local economy responds to its existence. As one longtime diver and shop owner stated,

You all (fishermen) can say what you want but some of your techniques are too destructive. I saw a parrotfish the other day on our dive, the first I have seen there in years. I won't tell you where it was because it will be gone tomorrow if I do. People come and spend money to dive here and many of us are dependent on the fact that there needs to be fish for them to see. Over the years I have seen the decline in species...My question to you (fishermen) is how do you catch fish for the community at the same time leaving fish that brings people here to dive. You have to make a living, but so do we. It is the tourist that comes here to dive that also wants your fresh seafood, how do we balance this equation? (2006 Local Dive Shop Owner)

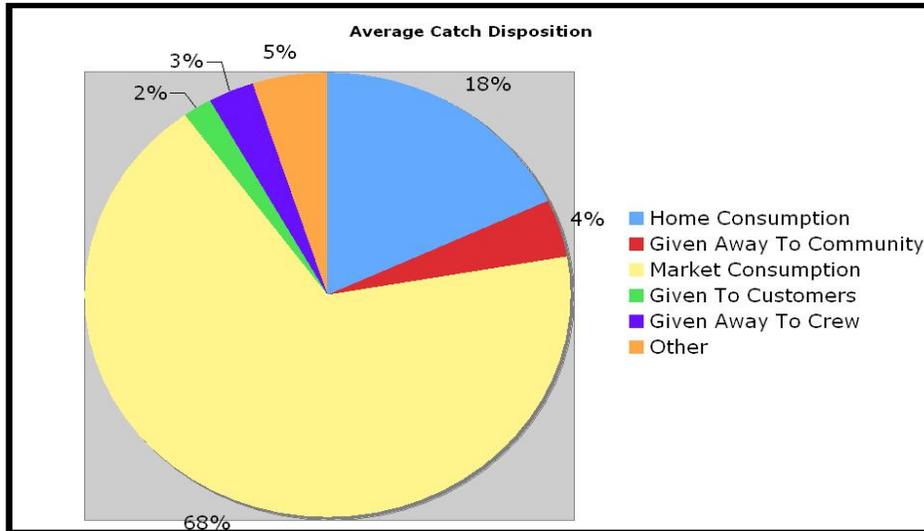
All of this highlights the complexity faced in managing a fishery impacted by a variety of forces, including but not limited to fishing harvest and tourism pressures. It creates an interesting opportunity for the development of a management system that creates sustainability through collaboration and demonstrates the level to which multiple stakeholders are tied to the maintenance of a healthy coral reef ecosystem and the protection of marine species for multiple uses and reasons.

Social and Economic Networks

There are a number of socio-economic networks that exist in St. Croix related to local fisheries. Whether these linkages specifically relate to the catch or relate to servicing the fisheries, it is important to document their existence so that the extent to which the community is tied to the local fisheries is appropriately considered. It also provides fishery managers with a sense of the level to which the local fisheries and community are interconnected, and thus impacted by fishery policies and the forces that alter the productivity of that fishery. This is especially important in the development of social impact assessments for fishery management plans.

Catch Disposition

Figure 10: Average Catch Disposition (N=96)



Catch disposition conveys a great deal of information about socio-economic linkages and the overall level of engagement in and dependency on the local fisheries. On St. Croix, almost 100% of the marine resources landed are retained on the island, with a small portion of pelagic species and conch sent to St. Thomas where, on average, a dollar more per pound can be obtained. In 2005, commercial fishermen responded that they sell more than two-thirds of their landings through local markets, a large portion of which was sold at the La Reine market. Also, fishermen reserve approximately 18% of their landings for home consumption, and give about 9% to customers (charter), crew or community members (Figure 10). This is important to note because it once again highlights the fact that the fish caught and landed in St. Croix, for the most part, are consumed in St. Croix. That means that the money generated to buy the fish likely comes from Cruzan economic activities. In turn, the money fishermen use to pay their bills and

purchase their daily necessities is supplied by people who desire fish for consumption and who work locally. This means that the system feeds off its own interaction. This is the basis for identifying aspects of local dependency on the fishery because the relationship can be viewed as reciprocal.

Figure 11: Photo of La Reine Fish Market



The La Reine market (Figure 11) is a physical location near the center of the island that provides individual stalls for fishermen to market their catch, as well as cleaning facilities for the disposal of fish waste after sale. Before the La Reine market was created, fishermen cleaned fish and left the waste along the sides of community roads. Some argued this practice was a potential health hazard as well as being unsightly. Because fishermen fish out of a variety of locales across the island and trailer their boats and catch, the centralized positioning of the market appeared to be well thought out and beneficial. It became evident, however, that fishermen do not view the La Reine market as a benefit because it eliminated traditional marketing locations where specific

relationships existed with local residents. Sometimes these relationships were multigenerational. As one fisherman stated,

It used to be that fishermen had their own spots and customers. People knew where to come and who they were dealing with, and that made everyone happy. Today they come into the market to buy fish and are immediately approached by guys they don't know, usually young boys marketing the catch from the first couple stalls. A lot of people don't like to hustle fish but that's what you have to do at the market. Before when we had our own places we never had conflict; people knew where to come, at what time and could get exactly what they wanted. Now they come to here (La Reine), get hassled, have to smell the backed up fish from the cleaners and be around people smoking pot, cursing and being rude. It might have been intended for good things, but I think it was better the old way.

It was common to hear these negative sentiments from fishermen who utilized the La Reine market (see Valdes-Pizzini et al., in preparation, for a more detailed discussion of La Reine market). Many fishermen feel that the loss of their local marketing areas changed the relationship that they had with their customers. While the La Reine market provides a central location for sale and an opportunity for some to make a living simply marketing fish, it has created conflict and competition among fishermen. There are people at the market that purchase coolers of fish at wholesale prices, or who market fish for fishermen who prefer not to have to wait around after a long day of fishing to hustle fish. In 2006, compared to 2004 and 2005, there appeared to be fewer fishermen using La Reine, and it was also clear some were returning to previously used areas around the island to market their fish.

Some fishermen have returned to delivering fish, one of the ways it was done in the past. For example, a local diver who alternates between spearfishing, conch and

lobster diving, states that during conch season he will sell a portion of his catch at the La Reine market, but he puts aside 150 pounds for a weekly delivery to a restaurant in Frederiksted. To a lesser degree he does the same with lobster. Like many of the other fishermen who dive for lobster, the majority of his lobster is sold to restaurants that only come to the market to pick up the lobster catch. There are few lobster brought to this market that have not already been sold, and restaurant employees or buyers will arrive daily to pick up the contracted amount from local fishermen. Those lobsters that have not been spoken for generally go to tourists who are “here for awhile.”

Another interesting relationship exists between the local dive shops and commercial divers (fishermen). In the past, after a long day of fishing and marketing their catches, commercial fishermen would load their empty dive tanks back on their boats or into their trucks in order to refill their dive tanks at one of the dive shops. In 2006, a local dive shop took the initiative to develop a mobile air refilling facility and carried it on a trailer to the fish market at La Reine. The dive shop provided the service of bringing air to the divers at their marketing locations. This allowed them to capture a significant portion of daily repetitive users. These users include fishermen who market their catch at La Reine, as well as those who market their catch in other areas but come to the mobile air refilling facility at La Reine because it is located in close proximity to their residence.

As mentioned already, restaurants play an important role in the supply and demand dynamics for certain categories of seafood, usually based on their clientele. One-fifth of the total commercial catch is sold directly to restaurants, although the percentage may be higher as some restaurants buy the fish at the landing site, through

retailers, or informal economic relationships. Most of the fishermen interviewed said that they had “their” clients to whom they sold fish on a regular basis, restaurants being the most regular customers for high value and preferred local species. There are a large number of local restaurants that buy local fish because of clientele preferences. It is common for restaurant owners or managers to meet with local fishermen at the La Reine market and ask for certain species. Fishermen will try to fish for these species in advance because they know who these people are and what day of the week they will come to the market.

The relevance of home consumption is often underestimated or misunderstood. The quantity of fish “brought ‘home’ for consumption” is an interesting phrase that warrants analysis. On St. Croix, “home” includes the extended family, not just those living under one roof within a single household. All family members living on the island can be included. Home includes all the “people you care for” and our survey suggests that 18% of the catch is used for home consumption. This quantity far exceeds other estimates in USVI research studies (Agar et al 2008). The fact that a more flexible interpretation of home was utilized by respondents in our study may explain the discrepancies in percentages between our study and others. If locals perceive home to be the “extended family,” then this definition of home appears to provide a better picture of the extent of distribution and subsistence use of the local catch.

Many fishermen reported holding back some of their catch as food for special, ceremonial events. Fish is a desired food on most tables, and for many fishermen the choice to consume seafood over other meats is a common one. For example, in Gallows Bay and Teague Bay it is a common, if not a daily occurrence, for local small scale

fishermen to take a portion of their catch to a local fisherman's house/cantina, where the fish are prepared and shared with others as dominos is played, beer is consumed, and stories are told. Sharing fish, or providing fish, is a part of the identity that makes a fisherman "feel special." About 9% of the total catch is reported to be shared in one form or another. Sometimes, the fish are shared with crew and consumed within the crewman's family, or shared or sold within the crewman's neighborhood. Also, sharing is a means of being able to provide local groups or organizations, such as a church group, with seafood for celebrations or events, often prepared as fish soup or fried fish. Some fish are simply given away to customers as a way of thanking them for their patronage as well as making sure that there is as little leftover and waste as possible. Fishermen argue that there really is not a concept of bycatch because almost all fish can be consumed, whether it is sold or shared.

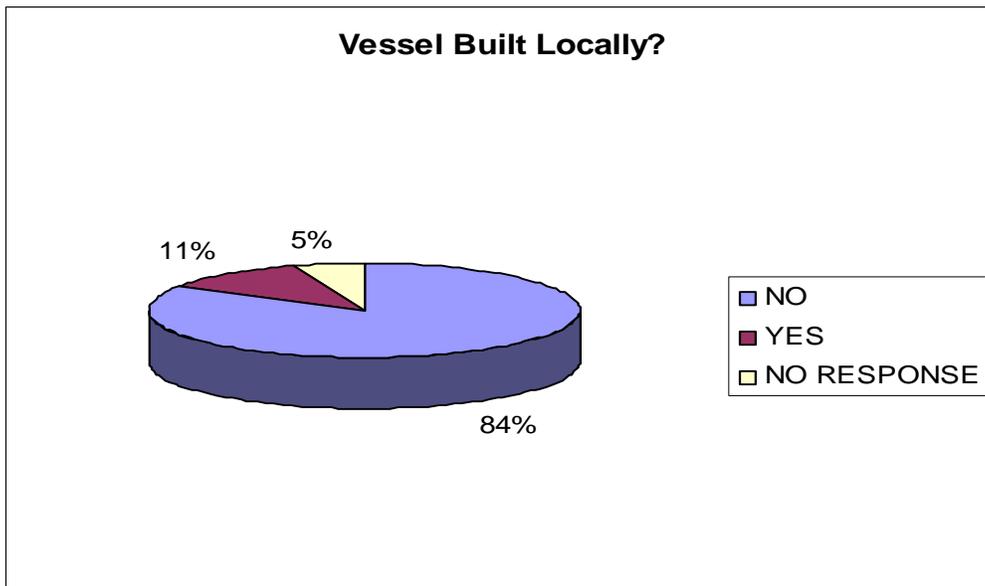
Community Linkages

How does dependence and engagement on fishing get determined? Factors such as the total pounds landed in an area, community or port, and the value of the seafood landed play significant roles in the determination of engagement and dependency. However, to fully understand engagement and dependency, socio-economic linkages directly and indirectly related to the presence of the fishery should be examined, especially the kinds of services provided to the fishermen. The survey focused on specific linkages as they relate to commercial fisheries and the socio-economic networks that comprise the community. While this approach does not build the entire framework

for determining the level of engagement and dependency, it highlights the interconnectedness between land-based activities and fishing.

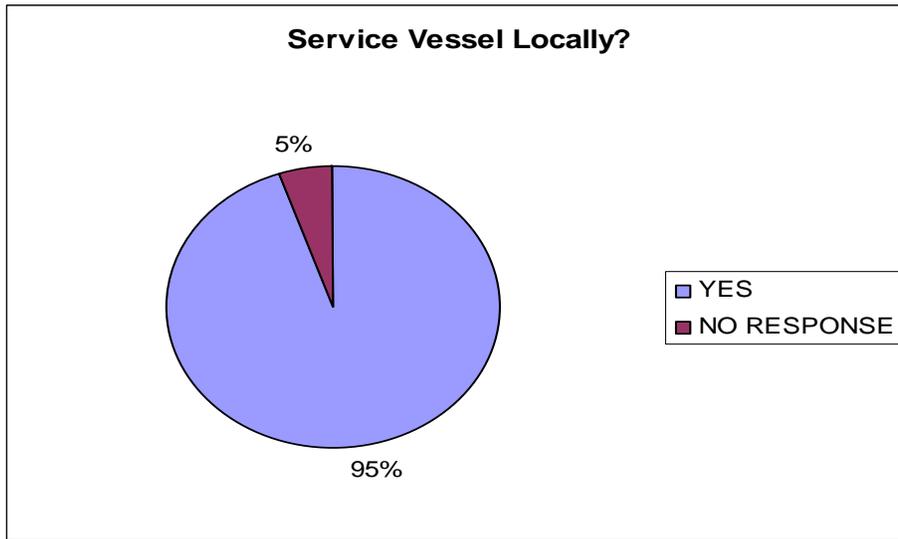
The following linkages were examined: where local commercial fishermen's vessels were built; where their vessel/engine is serviced; where their gear is purchased; where their navigational gear and electronics are purchased; and where they buy their bait.

Figure 12: Where is the Vessel Built (N=66)



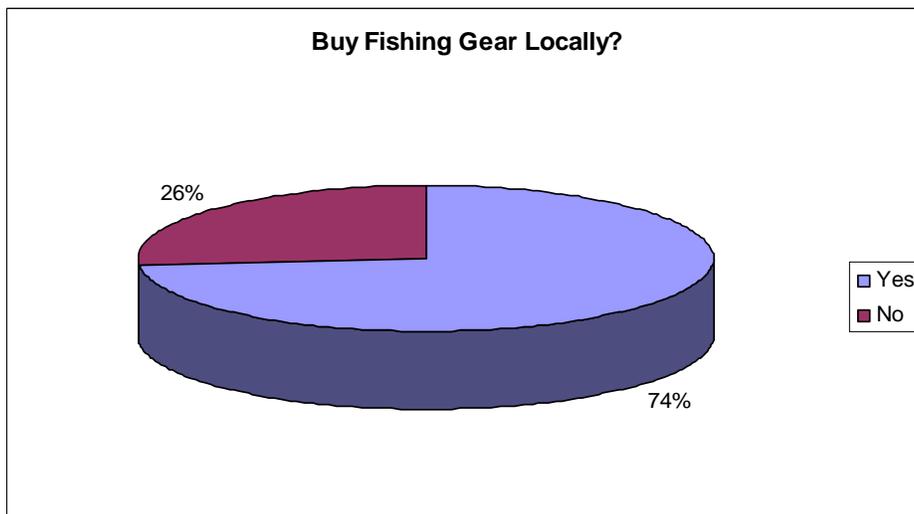
The fishermen are dependent on their local community resources as a means of providing services that keep the fisheries operational. Even though most fishermen, 84%, do not own boats that were locally built, some of them have boats that were purchased locally or within the region, including Puerto Rico, USVI and British Virgin Islands (BVI). About 53% of the vessels were built in Puerto Rico and another 36% were built in the continental United States and shipped to the USVI.

Figure 13: Where Your Vessel is Serviced (N=77)



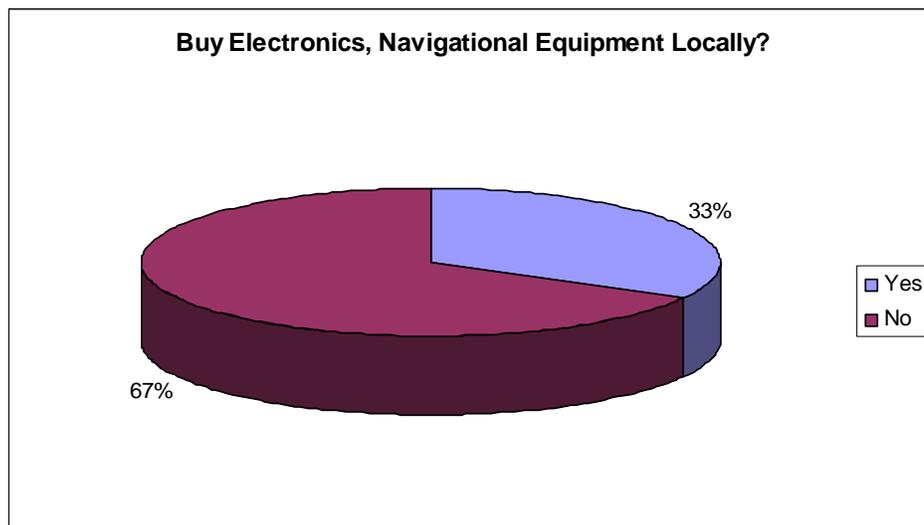
Almost all of the fishermen surveyed, 95% said that they have their vessels serviced locally, with over two-thirds doing it themselves. Fishermen report that they purchased a significant amount of their equipment from stores associated with local marinas, or through the internet if the part is not available locally.

Figure 14: Where do you Buy Your Fishing Gear (N=77)



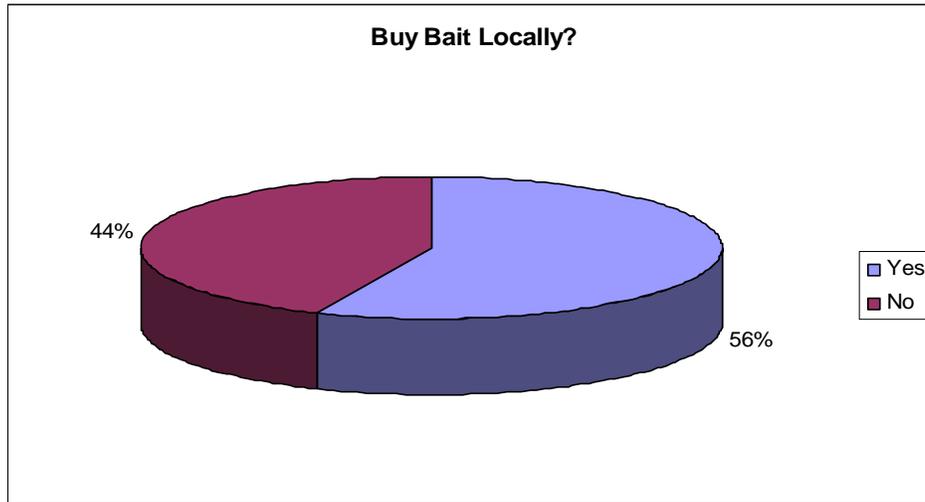
Seventy-four percent of the fishermen said that they buy their fishing gear locally. Many of them report having purchased their gear from the Christiansted and St. Croix Marinas. Fishermen who do not purchase their fishing gear locally often purchase their gear from commercial fishing supply stores in Miami, either by telephone or internet.

Figure 15: Where do you Buy Electronics/Navigational Equipment (N=77)



Over two-thirds of the fishermen surveyed do not buy their electronic/navigational gear locally. Many of the fishermen report that they do not buy this kind of gear locally because they do not own or utilize electronic gear, even though it is required by law to be present on the boat. Those who use the required equipment state that they obtain it from a variety of US companies. Of the one-third of fishermen that purchase electronic gear locally, about 67%, purchase it from the St. Croix Marina.

Figure 16: Where Do You Buy Bait (N=85)



Over half of the fishermen surveyed buy their bait locally and one-third of those fishermen get it from local supermarkets, such as Pueblo and Plaza Extra. Fishermen who used traps for yellowtail snapper and other reef fish will purchase stale or old bread to use as bait. This is a good relationship for both the fisherman and the supermarket, as the supermarket can unload non-saleable bread and the fishermen can buy it in bulk at a greatly reduced cost. A little less than half of fishermen do not buy their bait locally, with thirty percent of them catching their own bait rather than purchasing it. This is common in the hook and line fishery.

One of the ways in which the commercial and recreational sectors are connected is through the purchase and provision of bait. While working with commercial fishermen at La Reine, researchers observed local recreational fishermen buying barracuda for bait for a shark fishing trip. When asked about this sort of interaction, local commercial fishermen responded that it was common for recreational fishermen to purchase “bait” from commercial fishermen when they were not able to get their own or if they were

looking for something specific. These interchanges are generally pre-arranged. During 2005, there was a fisherman who cast nets for sprats, sardines and pinfish as a sole means of generating income. As he stated, *“everyone needs good bait to fish, so that’s what I do. I don’t catch tuna, but tuna is caught because of me.”*

The significance of these fundamental fishery linkages is that a majority of the services/infrastructure needed for the commercial fisheries is provided by local businesses. This means that there are a number of economic linkages between the fisheries and local businesses that extend outside what might be considered an individual community, some of which may specialize in providing services for marine related activities. This means that if the fishery were impacted so that these services are no longer required, or are no longer required at the same level, there would likely be a negative economic impact to other sectors of the local economy, which in turn could spill over into other areas of the economy not directly tied to the local fisheries.

Description of the Recreational Fishery

The recreational fishery is divided into four basic categories: 1) private boat fishermen, some of whom carry commercial licenses and occasionally sell part of their catches; 2) shore-based anglers; 3) charter fishermen; and 4) subsistence fishermen, defined as anglers who use boats and shore-based targeting strategies to catch fish primarily for personal consumption. Because this study focuses on the commercial fishery, no information was systematically collected regarding the recreational fishery. There were, however, opportunities to meet with recreational fishermen to discuss the

local importance of the fisheries from social and economic perspectives. To further assist in understanding the recreational fishery, previous studies that document the recreational fishery are utilized.

Sport and recreational fishing is an activity that contributes to the economy of St. Croix and is also a key component of the tourism sector. Because the direct and indirect economic impacts of recreational fishing are often “done quickly and shooting from the hip,” estimates are always prone to underscore high sums of money and the level of economic impact (Valdes-Pizzini et. al, in preparation). For this reason it is difficult to estimate the total value of this fishery, especially considering that much of the subsistence market is unknown and undocumented.

While the total number of recreational fishermen is unknown, there are perceived to be “thousands of shore based anglers,” including fishermen that use advantageous locations, such as the area below Hamm’s Bluff, to those that target the inshore shallows. On St. Croix, there are 566 registered recreational fishing vessels. Salt River and Christiansted are two of the most popular locales for fishermen who keep their boats in marinas (Valdes-Pizzini et al, in preparation). Like the commercial fishermen, many recreational anglers trailer their boats and launch from places such as Altoona Lagoon, Frederiksted Ramp, and Molasses Dock. As of 2009 there appears to be an increase in the number of professional charter boat operations, which may be filling an untapped or underutilized niche in the recreational fisheries.

Recreational fishermen target a wide array of species. Recreational and sport fishermen are said to target nearly 80 fish species, with 65 of these having commercial value, such as snappers and groupers (Valdes-Pizzini in preparation). Pelagic species

such as tuna, dolphin, wahoo, and kingfish are also highly valued and comprise a large portion of the offshore, recreational catch. This catch is often the fillet on the table at many of the local restaurants that service the tourist industry. Billfish, such as marlin, also are said to be an important part of the fishing sector as billfish anglers spend a great deal of money to go fishing (Mateo 2000).

Economically, recreational fishing supports a variety of local businesses including boat and engine repair, the provision of gear and bait, marinas, gas stations, and local grocery markets. In addition, restaurants and hotels are also impacted by recreational activities, especially during fishing tournaments. Many of the fishermen who target pelagic species, especially those who hold commercial licenses, formally or informally sell a portion of their catch as a means of defraying the cost of the day's trip or, in some cases, as a means for making a little "side money."

Sport and recreational fishing is a source of food for local anglers, but also some of the fish caught in sport and recreational activities enter into commercial markets. According to our interviews, the sport-fishing sector was an important supplier of pelagic species for restaurants, hotels and the local market. In that context, they develop a business and social relationship with a number of commercial fishers who entered into that market. From the standpoint of a leisure activity and an economic endeavor, the impact of this sector has been praised as an important component of the local economy, servicing both the interests of tourists and locals alike.

There is little doubt that the recreational/subsistence fishery is important to the local economy and is valued by many as a preferred leisure activity, especially among tourists who wish to fish on vacation and people who harvest resources as a means of

augmenting income and food. There is a greater need to research this growing sector and its socio-economic networks to better understand their potential impacts on the fishery and the households and businesses directly and indirectly affected by their existence. In addition, people tend to “turn to the sea” in times of economic uncertainty and crisis. The number of people who may be fishing as a means of providing food or generating extra income (even though a part of the informal economy) should be further examined.

Conclusions and Recommendations

Islands, particularly small islands, are special, bounded places characterized by networks of interactions and local economies that create dense linkages among their inhabitants. It makes a great deal of sense to treat them as a unified community. Our research shows that the people of St. Croix have a historic and contemporary connection to fishing. During slavery people used earnings from fishing activities to buy their freedom and the freedom of family members (Valdes-Pizzini et al. in preparation). Currently, Cruzans use fishing as a means for creating and maintaining economic independence and stability.

The data collected between 2004 and 2008 support an argument for considering the entire island as a place-based fishing community. Examination of the socio-economic networks directly and indirectly impacted by the existence of the fishery suggests that if these fisheries were removed from the cultural, social, and economic landscape of the island, the entire island would be in one way or another negatively impacted. Whether one points to the individual fisherman, the households associated with fishing employment, the businesses that rely on local harvest or the people that place food on

their tables because someone in their family fishes, it is clear that the local fisheries are an important factor in the well being of the island residents and promote social and economic stability. This supports the interpretation that there is a strong cultural connection between Cruzan's and St. Croix's surrounding marine environment.

This report has focused on a variety of variables in an effort to describe the local fisheries and highlight the linkages between fishermen and the society at large. Residence patterns and launching/landing sites shed light on why people no longer have to be tied to coastal areas in order to utilize the sea. In addition, it demonstrates that people are dispersed all over the island and are diversified in the locations they use. The dispersal of people and access to areas throughout the island also means that people are able to interact with each other more frequently, opening up new opportunities to engage in social relationships. Residence patterns seem to suggest an ethnic division throughout the island, with Black/West Indians living on the west-side of the island, Hispanics living throughout the central area, and Whites living on the east-side of the island. However, the development of improved transportation infrastructure enables socio-economic networks to extend out of residential areas and people are no longer limited to the places where they reside, fish or market their product, and instead can be viewed as a place with the opportunity for marketing goods and services.

The concept of catch disposition tells us a great deal about how fishermen utilize their catch, be it through generating revenue for individuals and households or through the ways in which fishermen share resources among family, friends and community members. The fact that almost 100% of the commercial catch is sold and consumed on

the island suggests that there is a strong tie between local residents and local marine fisheries. This is a tie that binds these people together socially and economically.

Fishermen are connected to their occupation by economic, social and cultural factors. Being a fisherman on St. Croix is a locally respected occupation with both social and cultural meaning for the individual. Cruzan fishermen collectively provide a level of economic security and stability for their households and extended families, in addition to those people involved in marketing as well as those who provide related services to the commercial, recreational and subsistence sectors.

Recognizing the importance of their role, local fishermen have expressed a desire to be active players in the policy process. This is because they believe a cooperative approach to making appropriate decisions regarding the development and selection of fisheries management alternatives will mitigate negative human impacts while still allowing for biological conservation. This is demonstrated by the active participation of both commercial and recreational fishermen in the Fishery Advisory Committee (FAC⁷).

Before his death, Robert McAuliffe requested that this research would highlight that St. Croix is a special place where the people care about the marine resources as much as any fishery manager. Recognizing that there is deviant behavior among some, behavior that must be dealt with, he felt it should not de-emphasize the fact that the majority of the fishermen fish within the rules as proposed by the law makers. He wanted it to be understood that the importance of the local fisheries extended beyond the fish harvested, and included the many opportunities created for local community

⁷ The FAC is comprised of local stakeholders who volunteer their time to meet and discuss issues related to fishing, specifically focused on the use and conservation of marine resources. The group includes commercial and recreational fishermen, a dive shop owner, local scientist, and member of the DPNR Fish and Wildlife. This group meets monthly.

members simply because the fisheries exist. Employment, education, income, self sustainability and a mechanism for dealing with social and economic crises: the fisheries provide local people with options not otherwise made available in other segments of society. As Thomas Daley so eloquently states,

The fisheries here give the youth a place to turn and to learn, to be proud of who they are and what they can provide for their family. There aren't other places for misguided youth to go. You look at our society today and see all the kids that drop out of school, turn to crime and drugs, what can they do to make money and get praise from their family and friends as doing an honest days work? These kids don't have an education, the system failed them. Yet these kids still need to be productive in society or they go to bad things to make their way. It used to be that you could turn to the fishing as a way to learn, a way to spend your time, and something to strive for, like owning your own boat. If we don't have fishing to give to the youth, they will simply follow the paths of many today and go on welfare or turn to crime. Do the people who make regulations understand that there aren't that many chances here? You can make it all about tourists but who do you think will do all the hustling and create all the problems when they come? -- the youth. Listen, if you want to make something that benefits St Croix from top to bottom, realize how important these fisheries are and don't simply think that your regulations only impact the fishermen, for our families, our old people, our young people, we all need this. It is who we are. It is who we have always been. People count on us. Don't you understand that?

This research has described some of the social, economic and cultural patterns that produce these sentiments. We have pointed out that more information is needed about the recreational and subsistence sectors of the Cruzan fisheries. It is apparent that there are limitations in the analyses presented here because we know much less about these sectors. This research highlights the fact that the recreational and subsistence fishermen and their networks should be given greater attention to fully comprehend the level of engagement and dependency of St. Croix on local fisheries.

Even though there are limits to what can be said about the fisheries as a whole, there is little question that these fisheries are deeply interwoven into the social, economic and cultural fabric of St. Croix. From slavery until today, from the menu at a renowned restaurant to the table of a local community member, fresh fish and seafood remains a desired commodity on St. Croix. The socio-economic indicators and linkages described in this report demonstrate substantial engagement and dependency on the marine resources, and provide a strong argument for designating the island as a whole as a fishing community.

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Appendix A: Sample survey instrument.

OMB Control # 0648-0494 Expires 8/31/2005

**SOCIO-ECONOMIC PROFILES OF FISHERS AND THEIR COMMUNITIES
IN ST. CROIX, USVI**

Interviewer	Date	No. Contacts	Refusal reason	Survey #

Public reporting burden for this collection of information is estimated to average one hour per response including the time for reviewing the instructions, searching the existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspects of this burden to Bob Walker, National Marine Fisheries Service, 75 Virginia Beach Drive, Miami, Florida 33149. This reporting is required under and is authorized under 50 CFR 622.5(a)(1)(v). Information submitted will be treated as confidential in accordance with NOAA Administrative Order 216-100. Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection displays a currently valid OMB Control Number. The NMFS requires this information for the conservation and management of marine fishery resources. These data will be used to develop a socioeconomic profile of fishing communities.

We are conducting a survey of fishers in St. Thomas and St. John to better understand the different problems that you face, how you work together with other fishers to address those problems, how you respond to changes in fishery resources and to new regulations, and what you would like to see for the future. The study is designed to help identify communities involved in fishing, how life in such places is changing, and how different agencies and people can deal with those changes.

Everything we talk about will be confidential. When we finish our interviews and other work, we will write a report that summarizes everything we've learned. We don't use people's names in our reports, or write about anything that is sensitive. Participation in this survey is completely voluntary, and you do not need to answer any questions you do not wish to answer. If you agree that sounds okay and if you don't have any questions, I'd like to start by asking you a few basic questions about your fishing operation.

Fishing Practices

We would like to ask you some questions about your fishing history and current practices. We do this to identify changes in fishing practices over time.

1. What kind of fishing do you mainly do now?
 - Commercial fishing captain (or crew?)
 - Charter fishing boat captain (or crew?)
 - Dive boat captain (or crew?)
 - Recreational fishing boat captain (or crew?)
 - Someone who fishes or dives primarily for food
 - Someone who fishes to add a little extra to household income (for example on weekends)
 - Other (specify): _____

2. Who first introduced you to fishing this profession/trade?

<input type="checkbox"/> Father	<input type="checkbox"/> Mother	<input type="checkbox"/> Wife	<input type="checkbox"/> Husband	<input type="checkbox"/> Brother	<input type="checkbox"/> Sister	<input type="checkbox"/> Son
<input type="checkbox"/> Daughter	<input type="checkbox"/> Cousin	<input type="checkbox"/> Friend	<input type="checkbox"/> In-laws	<input type="checkbox"/> Other _____		

3. Please rank your most important gears used **today** (1st to 5th most important) **and** species targeted .

Gear:

Species targeted (3 top species)

- __ Seines (beach seine [], haul seine []),
- __ Nets (gillnet[], trammel net[], cast net[], umbrella lift nets []),
- __ Lobster Pots
- __ Modified lobster pot lobster
- __ Fish Pots,
- __ Hook and line (surface longline [], botton longline [],
vertical setline – multihook deepwater snapper-grouper[],
vertical setline-single hook for pelagics [],
trolling [], drift fishing[], anchor fishing[], hand-line[], rod and reel[])
- __ Skin (free) diving []
- __ Hookah diving []
- __ Scuba diving []
- __ Spear fishing (either scuba, hookah, free diving)
- __ Other (list): _____

4. Please rank your most important gears from **5 years ago** (1st to 5th most important): Species targeted:

Gear:

Species targeted (3 top species)

- Seines (beach seine [], haul seine []),
- Nets (gillnet[], trammel net[], cast net[], umbrella lift nets []),
- Lobster Pots
- Modified lobster pot lobster
- Fish Pots,
- Hook and line (surface longline [], botton longline [],
vertical setline – multihook deepwater snapper-grouper[],
vertical setline-single hook for pelagics [],
trolling [], drift fishing[], anchor fishing[], hand-line[], rod and reel[])
- Skin (free) diving []
- Hookah diving []
- Scuba diving []
- Spear fishing (either scuba, hookah, free diving)
- Other (list): _____

5. If significant changes in gear composition, ask why the change:

Household, Demographic, and Employment Information

Now we would like to ask you questions about your household. We interested in understanding the importance of fishing compared to other activities.

10. What is your marital status?

Single Married Divorced Widowed Other _____

11. Total number of household members (including interviewee): _____

12. How many household members, including yourself, earn income from fishing? _____

13. How many household members, including yourself, have non-fishing jobs? _____

14. Rank the top 4 non-fishing activities that contribute to your household

1 st most important activity	_____	2 nd most important activity	_____
3 rd most important activity	_____	4 th most important activity	_____

15. Community linkages

- a) Is your vessel locally built? (Yes / No)
- b) Do you service vessel locally? (Yes / No)
- c) Do you service the engine locally? (Yes / No)
- d) Do you buy your fishing gear locally? (Yes / No)
- e) Do you buy electronics, navigational gear locally? (Yes / No)
- f) Do you buy bait locally? (Yes / No)

Crew composition

Now we would like to ask a few questions about your crew to fully describe your fishing activities.

16. How many people usually fish with you on a typical fishing trip? _____

17. Crew relationship

Crewman # 1: Relationship

Crewman # 2: Relationship

Crewman # 3: Relationship

Crewman # 4: Relationship

18. How difficult is it to find acceptable crew?

- Very difficult Fairly difficult Fairly Easy Very Easy N/A Don't know

Fishery issues

Now we would like to know what you think are the most important issues related to the local fisheries.

21. Please indicate, using the following 5-point scale, what you believe about the overall state of the fish stocks and coral reefs and mangrove habitat in the Virgin Islands were 10 years ago, 5 years ago, today, and 5 years from now (assuming current management and fishing behaviors).

**1=Dead Coral Reef,, 5= Healthy Coral Reef,
 1=No Fish,, 5=Abundant Fish
 1=No mangroves,.....,5=Abundant Mangroves**

	<i>10 years ago</i>	<i>5 years ago</i>	<i>Today</i>	<i>5 years from now</i>
Coral Reef Habitat				
Overall State of Fish Stocks				
Mangroves Habitat				

22. Please explain why you believe this about coral reef habitat, fisheries, and mangrove habitat:

Coral reef habitat:

Overall state of fish stocks:

Mangrove habitat:

23. Now we would like to ask you how you feel about the local marine reserves.

Area	Have you Fished Here? (Y/N)	Please state whether you agree with the following statements using a scale of 1 to 5 (1=strongly disagree; 5=strongly agree, NK=don't know, NA=no answer)							
		Effectively protects spawning aggregations	Improves reef-fish abundance <u>within MPA</u>	Improves reef-fish abundance <u>in adjacent fishing areas</u>	Effectively protects fish sensitive sites (e.g. nurseries areas)	Effectively restores/ maintains habitat quality (e.g., coral reef, sea grasses, and mangrove habitats)	Adversely impacted your ability to support yourself and your family	Creates social or economic hardships on fishing dependent communities	Maintains and/or enhances employment & investment opportunities (e.g., charter, scuba diving)
Hind Bank MCD			Species:	Species:					
East End Marine Park			Species:	Species:					
Buck Island National Monument			Species:	Species:					
Lang Bank			Species:	Species:					
Other			Species:	Species:					

Wrap Up

The following questions seek to understand how dependent you are on fishing in relation to other kinds of activities you may engage in.

24. Can you estimate the replacement value of your own personal vessel(s), gear, electronics, and other fishing equipment? \$ _____

25. What percentage your **total household** (not personal) income comes from fishing activities _____ %

26. Compared to five years ago, how do you describe the financial well-being of your household?

- Much Better Better About the same Worse Much worse N/A