Fishermen, Politics, and Participation: An Ethnographic Examination of Commercial Fisheries Management in St. Croix, U.S. Virgin Islands

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Fishermen, Politics, and Participation: An Ethnographic Examination of Commercial Fisheries Management in St. Croix, U.S. Virgin Islands

by

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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DEDICATION

To the commercial fishermen of St. Croix

& the rest of my “island family”
ACKNOWLEDGEMENTS

This study was made possible by funding from the PADI Foundation, the unfailing support of my husband and best friend, and the many people of St. Croix who shared their lives and experiences with me.

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ABSTRACT

Currently, there is widespread debate regarding the overall status of the world’s fisheries, with some researchers projecting their total collapse in only a few decades, and others concluding the situation is not quite as bleak. Additional debates include what strategies should be used to manage fisheries at various scales, and further research is needed to determine which strategies are most appropriate for use in particular situations and locales, as context is critical.

Recently, prominent common pool resources scholars have expressed the need for ethnographic approaches to studying resource management institutions in order to move beyond the current focus of simply identifying the factors and conditions that lead to the self-organization of resource users and long-term sustainability of management institutions. These authors describe the need for examining the larger context in which management institutions exist and taking various historical, political, and sociocultural factors into account when examining common pool resources. This dissertation is a response to that request.

This research is the result of over 20 months of ethnographic research in St. Croix, United States Virgin Islands (USVI). Drawing on research in political ecology and building on anthropological critiques of common pool resource institutions, I describe the historical, social, and political factors that influence how fisheries management occurs at the federal and territorial levels, and how commercial fishers,
managers, and other stakeholders experience and participate in multi-scale management processes. Ethnographic data suggest that there are a variety of historical, social, and political factors that influence how commercial fishers, managers, and other stakeholders perceive the federal fisheries management process, the extent of their participation in that process, as well as interactions within and between stakeholder groups. Additionally, the mismatch that exists between the centralized management structure of the US federal system and the small-scale, multi-method nature of St. Croix’s fishery creates a complex management environment in which few stakeholders participate.
CHAPTER 1
INTRODUCTION

This dissertation is an ethnographic examination of the commercial fishers of St. Croix, United States Virgin Islands (USVI), focusing on their perceptions, experiences, and responses to federal and territorial commercial fisheries management processes. Drawing on research in political ecology and building on anthropological critiques of common pool resource institutions, I describe the historical, social, and political factors that influence how fisheries management occurs at multiple scales and how it is experienced by fishers, managers, and other stakeholders. This multi-scale approach is both timely and important as resources and communities throughout the world are becoming increasingly globalized and inter-connected. Additionally, and partly as a result of the increasing inter-connectedness, it is becoming more common for resources and resource users to be subject to regulations and management regimes at multiple levels (such as federal and territorial). For this reason, it is critical to examine how management institutions across scales impact one another and influence key elements of management, such as stakeholder participation and compliance. Fisheries management in St. Croix provides an opportunity to explore how the complexities of multi-scale resource management occur at the local level, and how resource users and other stakeholders experience and perceive those processes.
Significance of the Research

Globally, humans are highly-dependent on fisheries. In 2007, fish accounted for close to 16 percent of the world population’s animal protein consumption, and about six percent of all protein consumed (FAO 2010). Additionally, approximately 44.9 million people were directly engaged, full-time or part-time, in the world’s fisheries, and it is estimated that 540 million people—about eight percent of the world population—are supported by fisheries through the primary sectors (harvest activities), secondary sectors (post-harvesting activities, such as fish processing), or through family members with those jobs (FAO 2010). These numbers are only expected to increase in coming years as the global population increases, especially in developing countries, which depend highly on fish as a source of protein. Despite these expected increases in demand and dependence, fisheries production is not increasing at the same rate.

Currently, there is widespread debate regarding the overall status of the world’s fisheries, with some researchers projecting their total collapse in only a few decades (Marra 2005; Worm, et al. 2006) and others concluding the situation is not quite as bleak (Hilborn 2007). Additional debates include what strategies should be used to manage fisheries at various scales, and further research is needed to determine which strategies are most appropriate for use in particular situations and locales as context is critical. Recently, prominent common pool resources scholars have expressed the need for more ethnographic research regarding resource management institutions in order to move beyond the current focus of simply identifying the factors and conditions that lead to the self-organization of resource users and long-term sustainability of management institutions (Agrawal 2002; Berkes 2009; McCay 2002). Each of these authors describe the need for examining the larger context in which management institutions exist and
taking various historical, political, and sociocultural factors into account when examining common pool resources. This dissertation is a response to that request.

Current fisheries management research tends to fall into one of two areas: a focus on the large-scale, industrialized fisheries of developed countries (such as countries in North America and Western Europe), or a focus on the small-scale fisheries of developing countries (such as those of Pacific island nations). St. Martin (2005) contends that this “First World”/“Third World” binary approach to resource management research limits how researchers and managers perceive possible management solutions because it restricts the suite of management arrangements believed to be appropriate in either kind of location. He believes that by using the tools of political ecology this dichotomy can be dissolved, which allows for a reconsideration of the suite of management arrangements that can be used in either kind of location, therefore opening up opportunities for greater resource management success.

Figure 1. Map of the United States Virgin Islands (Magellan Geographix 1997).
St. Croix, the focus of this study, is one of the three main islands of the USVI, which lie in the subtropic Caribbean, approximately 90 miles east of Puerto Rico (Figure 1). St. Croix offers a unique opportunity to examine the political ecology of fisheries management institutions because it lies somewhere between the “First World” and “Third World” arrangements to which St. Martin refers. The island’s fishery is quite similar to the small-scale fisheries of many “Third World,” developing countries for many reasons, including: the multi-method, multi-species nature of the fishery, the fact that almost all of the catch stays on the island, and that it faces many of the same challenges as small-scale fisheries (such as a lack of funds, resources, capacity, data, and government support and investment; corruption in government agencies; and poor enforcement). However, because St. Croix is a United States (US) territory, the fisheries of the island’s exclusive economic zone (EEZ) are subject to the US federal fisheries management system. This system is primarily based on the large-scale, industrialized fisheries management model used to manage all of the country’s fisheries, most of which are much larger in scale. Due to this complexity, examining how fisheries management plays out in St. Croix is a unique opportunity to look at how fishers, managers, and other stakeholders perceive and participate in territorial and federal management processes. Moreover, St. Croix’s long history of migration, colonialism, and long-time dependence on and connection to fishing provides an opportunity to examine the political ecology of fisheries on the island and how historical patterns of race, ethnicity, and power relate to current patterns of resource use and influence in fisheries management processes.

**A Day in the Life of a Crucian Commercial Fisher**

A fisher’s day begins around 4 AM, before the sun rises over the island. His alarm goes off and he quickly grabs his cell phone to check the weather before he even
gets out of bed. If the weather doesn’t look too stormy, he quickly gets dressed and runs down to the first floor of the house to knock on the door of his younger brother’s apartment, letting him know they will be leaving soon. By the time he runs back upstairs to say goodbye to his wife and then down again to the driveway, his brother is already loading the boat that is attached to his old pick-up truck with the bait (burned cow hide) they will be using to bait the lobster traps that day and several coolers of ice. Shortly after, they are in the truck and pulling the 20-foot boat down the road and toward the gas station.

It takes about 10 minutes to reach the gas station, as they must drive very slowly over the pot-holed roads. But, there are very few cars out and about at this time of the morning, save for a few other fishers and oil refinery employees. The gas station, however, is bustling with pick-up trucks, boats, and fishers, as they fuel up their boats at the pumps and grab snacks from the shop to tide them over until they return to the island for lunch. Once the boat is filled up, they head off again down the road toward whichever boat ramp they have chosen to use that day.

When they arrive at the ramp, they get out of the truck and quickly change out of their clothes into their wetsuits. One of the fishers then backs the truck and boat backwards down the ramp, while the other remains on the boat and quickly pulls it away from the ramp once it is launched. The truck is then parked nearby and within minutes the boat is racing out to sea toward the lobster pots they set a few days before. All this happens before the sun even rises.

It takes them about 30 minutes at full-speed to reach the lobster pots they set a few miles off the island. For two hours, they maneuver the boat from pot to pot, fighting
the waves and currents to pull each pot up by hand, remove the lobster, rebait the pot with the cow hide, then drop the pot back to the sea floor. Once all the pots have been pulled, the boat immediately heads off to the day’s chosen dive spots, usually only a few minutes away. One of the fishers dons his scuba gear, grabs his spear gun and the bag in which he’ll place his speared fish, and slips off the side of the boat. He drops down about 70 feet below the surface of the water, and immediately begins hunting the fish his customers like best, such as parrotfish, triggerfish, and yellowtail snapper. One by one he chooses his target and fires his speargun, rarely missing. Once he has run out of air (typically about 30 minutes), he follows the line he has been towing up to the float at the surface of the water which has indicated to the other fisher on the boat where he has been diving. The speared fish and his gear are hauled up on the boat, and he prepares for another dive with a new tank while his brother quickly puts the speared fish into the cooler filled with ice. He will dive several more times (sometimes up to 5 more times!) before they return to shore.

Once they are back on shore, one fisher jumps out at the boat ramp to go fetch the truck and backs it down the ramp to reconnect with and haul out the boat. Without resting for even five minutes, they are both on the phone, either calling potential customers to sell the day’s catch, or letting customers who have already placed orders know that they are back at shore. They quickly change into dry clothes, then take the 20 minute ride to the fish market located in the middle of the island. Once they arrive at the fish market, other fishers help them unload their catch, and the boat is parked in the nearby parking lot. One of the fishers remains at the market to sell to any customers who
stop by, while the other begins delivering those fish and lobster already accounted for to
the restaurants and resorts across the island.

By around 2 or 3 PM, if there are any fish or lobster that have not been sold, they
are packed on ice, and brought back to the fishers’ home to be kept frozen until the
following day. A fisher’s afternoon and evening are usually his own, and while
sometimes time is spent resting or napping, more often than not, he can be found
repairing his gear, preparing for his next fishing day, or helping a fellow fisher work on
his boat or gear.

The purpose of this vignette is to provide readers with a sense of how St. Croix’s
commercial fishers make a living—the long days, the hard work, and the challenges they
face on a daily basis. Despite the strenuous nature of the practice of fishing, few would
elect to hold any other occupation, and most intend to fish until they are no longer
physically capable. It truly is a way of life.

Overview of the Study

In this dissertation I examine fisheries\(^1\) management in St. Croix, focusing on the
manner in which commercial fishers and members of other stakeholder groups participate
in the federal fisheries management process. The goal is to understand how historical,
social, and political factors influence how commercial fishers and other stakeholders
experience territorial and federal fisheries management. Building on anthropological
critiques (Acheson 1988; McCay 2002; McCay and Acheson 1987) of commons
management strategies that debunked the inevitability of Hardin’s “Tragedy of the
Commons” (1968), I examine the “on-the-ground” reality of fisheries management in St.
Croix. This allows me to move beyond traditional approaches to commons research

\(^1\) For this study, St. Croix’s “fishery” refers to the capture and sale of marine finfish and shellfish.
(which often focused on determining the conditions or “design principles” that contribute to successful management of common-pool resources) (Dietz, et al. 2002; Ostrom 1990) and answer the recent call for an approach grounded in in-depth ethnography that considers the larger context in which management systems are embedded (Agrawal 2002; Berkes 2009; McCay 2002). To do so, I draw on political ecology, an approach that is well-suited for this kind of research which requires an examination of the intricacies of relationships between people and socioecological processes across multiple scales.

**Contributions to Anthropology**

This research addresses several gaps in the anthropological literature. Building on anthropological critiques of management institutions (Acheson 2006; Agrawal 2003), I provide evidence of the mismatch that exists between the small-scale fishery of St. Croix and the US federal centralized fisheries management model to which St. Croix is subject. This provides important insights into how this mismatch impacts the extent to which fishers participate in the federal management process, as well as the effectiveness of the regulations currently in place. Additionally, the fisheries anthropology literature provides numerous case studies that describe the various forms of management that have been developed both formally and informally by fishers and others throughout the world to manage their fisheries resources. Building on these case studies and common pool resources theory (Jentoft and McCay 1995; McCay 1981; Ostrom, et al. 2002), I move beyond a more typical approach of identifying those organizational characteristics related to sustainable\(^2\) commons management institutions, and instead focus on the historical, social, and political factors that impact how a common pool resource (fisheries) is

\(^2\) An in-depth discussion of the term “sustainable” is beyond the scope of this dissertation. Generally, I use this term to refer to the use of resources in which the needs of today’s generation are met without compromising the ability of future generations to harvest for their needs (FAO 1995).
managed in St. Croix as well as how commercial fishers perceive and experience management processes. To do so, I draw on political ecology, an approach that is well-suited for this kind of research which requires an examination of the intricacies of relationships between people and processes across multiple scales (Gezon and Paulson 2005; Stonich 1998; Zimmerer 2006).

Building on these identified gaps in the literature, the following research questions were formulated to guide the research design, data collection, and analysis:

1. What is the social, economic, and historical role of fishing in St. Croix?
2. What is the current structure of marine fisheries management in St. Croix?
3. How are fisheries management decisions made at different scales, and do commercial fishers participate in this process? Why or why not? To what extent do fishers and other stakeholders perceive their participation to influence management decisions?
4. How do social relationships and the organization of the fishers affect the extent to which they participate in the management process and influence management decisions?
5. How does the structure of the federal fisheries management system affect the extent to which the fishers and other stakeholders are able to influence management decisions?

The data presented here are the result of 20 months (March 2009—December 2010) of ethnographic research on the island of St. Croix in the USVI. 92 semi-structured interviews were conducted with commercial fishers, territorial and federal managers, and other stakeholder groups, observations conducted at 30 territorial and federal fisheries management meetings, more than 200 instances of participant observation at the La Reine fish market on Saturdays, and extensive participant observation and informal interviews that occurred both publicly and privately throughout my time on the island.
From prior research conducted with fishers in the USVI, I was aware of the controversial nature of fisheries management issues in the territory, and the great mistrust many of the local fishers and managers have for “outsider” scientists like myself. For this reason, I knew that participant observation would play a critical role in my data collection efforts, and that it would take several weeks or months for me to establish rapport with important individuals. Other data collection procedures, such as not recording semi-structured interviews and not taking field notes while “hanging out” at the fish market and other relevant locations, were purposively practiced so as to reduce participants’ suspicion of my intended use of the data I was collecting as well as to help ensure their anonymity. These are common practices used when conducting ethnographic research with fishers (Kitner 2006).

Although I had intended to conduct brief questionnaires with about 40 individuals from each identified stakeholder group on the island, then to conduct in-depth, semi-structured interviews with a small number of individuals from each group, my interviewing strategy changed once I entered the field and began my research. Because several of the stakeholder groups involved in fisheries management in St. Croix are made up of only a small number of individuals, and because the small number of individuals involved in fisheries management in St. Croix were members of several stakeholder groups, I changed my strategy and conducted one in-depth semi-structured interview with each participant. This format allowed me to ask all participants common questions, but also allowed the interviewee to determine which topics were addressed. Semi-structured interviews are commonly used by anthropologists when conducting research with fishers (Blount 2007; Kitner 2006; Olson 2006).
Structure of the Dissertation

In Chapter 2, I present the theoretical literature I draw upon to examine commercial fisheries management in St. Croix. I introduce anthropological critiques of fisheries management institutions and common pool resource theory, and explain how I explore the on-the-ground reality of fisheries management in St. Croix, allowing me to move beyond traditional approaches to commons research (which simply identify the factors and conditions that lead to the self-organization of resource users and long-term sustainability of management institutions) and answer the recent call for an approach grounded in in-depth ethnography that considers the larger context in which management systems are embedded. The objectives of the dissertation are also presented, including a discussion of how each objective builds from and addresses gaps in the current literature.

In Chapter 3, I present my ethnographic methods of data collection and discuss important methodological decisions that were made based on the highly contentious nature of commercial fisheries management in St. Croix. The research design is described in detail, including the research questions, sampling strategies, and methods of data collection and analyses. I also introduce the study participants, highlighting the sampling strategies used and how the small number of individuals involved in fisheries management in St. Croix impacted the research design and analyses employed.

In Chapter 4, based on detailed archival research with documents in St. Croix, I describe the historical development of St. Croix in order to uncover how ethnic relations on the island today are linked to colonial history and the demographic changes that resulted from the development of tourism and manufacturing in the 1960s. The island’s history is traced through time, including the prehistory, colonial, and post-colonial
periods, highlighting important events that have had a lasting impact on Crucian society. In this chapter, I also introduce the main ethnic groups present today in St. Croix and discuss the intricacies of their relationships with one another, as well as how these relationships are related to patterns of migration. I conclude the chapter with an explanation of why it is important to include information regarding colonial history and ethnic relations in discussions of contemporary fisheries management in St. Croix.

Chapter 5 traces the development of fisheries management in the US and in St. Croix, highlighting important events and scientific theories that guided the manner in which it was developed (research question 2). This provides historical context for the current state of management and provides important information regarding recent social science critiques of US fisheries management legislation. I also describe the fishing regulations currently in place in both territorial and federal waters, as well as the groups responsible for their development. I then analyze data collected through semi-structured and informal interviews, meeting observations, and participant observation to show that there are several limitations in the ability of these bodies to manage the island’s fisheries effectively. As a result, the actual day-to-day reality of management as it occurs in the local context differs from how it is legislated to be (research question 5).

Chapter 6 builds on the information presented in Chapters 4 and 5 regarding the historical and contemporary conditions of Crucian society and commercial fisheries management in order to illuminate the long-term connections between the island’s residents, the practice of fishing, and fish consumption (research question 1). Similarities and differences in fishing practices and fishery characteristics at different points throughout the island’s history are highlighted. Examining these historical patterns
provides a better understanding of fishers’ behaviors and perceptions of fisheries management today, as well as how fishers interact with territorial and federal managers, scientists, and other stakeholders such as dive shop owners. Additionally, analyzing how fishers’ practices have changed over time provides insight into factors that impact the social organization of the fishers and how that affects their participation in the management process, which is the central topic of Chapter 9.

Chapter 7 presents a variety of data and analysis results regarding the context in which fishery management decisions were made during my fieldwork. These data include those regarding the biophysical environment of St. Croix, the status of stocks of commercially-targeted fish species, trends in commercial landings, and the results of the most recently-completed census of the island’s commercial fishers. Additionally, I introduce two important regulatory actions that were being discussed at management meetings and impacting fishers during my fieldwork—the ban of the use of gill and trammel nets (for anything other than bait fish) in territorial waters, and the implementation of annual catch limits in federal waters. These two case studies serve as the focal point of critical discussion in the main results chapters (Chapters 8 and 9) in order to present specific examples of how fishers, territorial managers, and other stakeholders participate in the territorial and federal management processes.

In Chapter 8, I present the results of quantitative and qualitative data analyses performed on semi-structured interview data, and compare participants’ responses regarding their knowledge of, participation in, and beliefs about fisheries management in St. Croix (research questions 3 and 5). Explanations for these similarities and differences are provided using data from participant observation, field notes, informal conversations,
and meeting attendance and observation. These analyses allow me to address my research questions regarding how commercial fishers and others participate in the management process, and the extent to which they perceive their participation to influence management decisions. Additionally, in this chapter I reveal how the structure of the federal fisheries management system affects the manner in which stakeholders participate in and influence the management process. More specifically I discuss the lack of cooperation between territorial and federal management systems, and the effect it has on stakeholder participation.

In Chapter 9, I present data regarding the organization and social relationships among St. Croix’s commercial fishers and examine the relationship between the extent of that organization and fishers’ participation in the federal management process (research question 4). Building on the commons literature regarding management institutions which has focused primarily on identifying conditions related to the success of community-based resource management, I use data collected through semi-structured and informal interviews, participant observation, and observation at public meetings to examine the social organization of resource users in a place where complex, socially-induced commons management strategies do not exist. I explore what the lack of formal organization means in terms of fishers’ participation in the federal fisheries management process and the extent of their influence regarding management decisions. Additionally, I utilize ethnographic and archival data in order to show how historical patterns of ethnic relations and fishing practices are related to the social relationships among fishers and the organization of fishers today.
Finally, in Chapter 10, I summarize the main research findings of the dissertation, demonstrating explicitly how I addressed my research questions. I then describe the contributions of my study to the fields of anthropology and applied anthropology. I also present policy recommendations and future research directions identified by the research findings, and conclude the chapter with a summary of my plan for disseminating my research to study participants, scientists, managers, and the broader public.
CHAPTER 2
THEORETICAL FRAMEWORK: ANTHROPOLOGICAL CRITIQUES AND
THE POLITICAL ECOLOGY OF FISHERIES MANAGEMENT INSTITUTIONS

Chapter Overview

In this dissertation, I examine fisheries management in St. Croix, focusing on the manner in which commercial fishers and members of other stakeholder groups participate in the federal fisheries management process. The goal is to understand how the process occurs in the local context, and how participation is related to historical, social, and political factors as well as the relationships within and between commercial fishers and other stakeholders. In order to understand how federal fisheries management is currently being practiced in St. Croix, I draw from three fields of study: (1) fisheries anthropology, (2) the commons and common pool resources theory, and (3) political ecology. Drawing from fisheries anthropology literature and anthropological critiques of management institutions provides a context in which to examine the United States (US) federal fisheries management system, as well as how that system plays out in St. Croix. Additionally, the fisheries anthropology literature provides numerous case studies that describe the various forms of management that have been developed both formally and informally by fishers and others throughout the world to manage their fisheries resources. Building on these case studies and common pool resources theory, I move beyond a more typical approach of identifying those organizational characteristics related to sustainable commons management institutions, and instead focus on the historical, social, and
political factors that impact how a common pool resource (fisheries) is managed in St. Croix as well as how commercial fishers perceive and experience management processes. To do so, I draw on political ecology, an approach that is well-suited for this kind of research which requires an examination of the intricacies of relationships between people and processes across multiple scales. As I outline in this chapter, by combining the approaches utilized in these three fields, I make significant contributions to the field of anthropology, as well as marine policy and natural resource management.

**Fisheries Anthropology**

Although anthropological discussions of fishing practices began almost a century ago, fisheries anthropology (or maritime anthropology, as it was originally called) did not develop as a subfield of anthropology until the mid-1970s (Acheson 1981). What began as a field concerned mainly with describing the fishing practices of indigenous cultures (such as Firth 1946; Malinowski 1922) and the behaviors of commercial fishers in industrialized countries (such as Orbach 1977) has become a largely interdisciplinary and applied field inextricably linked to fisheries management (See Acheson 1981 for a complete description of early trends in fisheries anthropology). As numerous fish species continue to become commercially extinct, and the communities and people dependent upon them continue to struggle to maintain their livelihoods, fisheries anthropologists have turned their focus to describing and analyzing management practices and institutions (McCay 2002).

Anthropologists such as Acheson (1989) and Pinkerton (1994) have suggested criteria for classifying fisheries, primarily by the type of management system employed. In order to discuss anthropological examinations of fisheries management models, I will draw from a typology used by Durrenberger and King (2000), which identifies three
types of management: (1) state-level, centralized management, (2) community-based/folk management, and (3) co-management. It is important to note, however, that quite often fisheries management systems do not fit neatly into one category, and, for example, a centrally-managed fishery might exhibit characteristics of co-managed fisheries. The typology presented here simply represents general guidelines, and should not be interpreted as steadfast rules. This framework is relevant to the dissertation because it provides anthropological critiques of the models as well as a context in which to view the US federal fisheries management system, and how that system plays out in St. Croix. As will be shown here, although St. Croix and the United States Virgin Islands (USVI) fisheries are similar to small-scale fisheries throughout the world that are often managed using community-based, folk management strategies, because they are a US territory, they are part of the US federal fisheries management system, based primarily on a centralized management structure. This mismatch means that the management tools and strategies employed by the federal system are often not the most appropriate and effective approaches for dealing with fisheries management issues in St. Croix.

**Centralized Management**

Centrally-managed fisheries are usually commercial fisheries that are managed by a state-level governing body. In these cases, the state determines the rules of access, appropriation, and allocation of the resources (King and Durrenberger 2000). Fishers often have little influence in defining the rules of management or making any decisions. In state societies, fisheries are defined by the policy that controls their use and management. In such fisheries, the state holds exclusive management rights and employs fisheries scientists to carry out research that will assist in management decisions. These management systems are often based on bio-economic models, Western notions of
democracy and top-down governance, and Hardin’s (1968) “tragedy of the commons” theory, which assumes fisheries are common-pool resources and, therefore, the state must control the harvest and use of fish to maintain continued productivity. Regulations are focused on the control of fishing effort, methods, season, space, or capacity, and often implemented through regulations of seasonality, gear, or sizes of fish caught. Examples of such systems include the European Union (EU), the US, and Canada.

Hardin’s (1968) article, “The Tragedy of the Commons,” greatly influenced the formation of fisheries management regimes in industrialized countries throughout the 1960s and 1970s. Hardin suggested that common pool resources (those “owned” by the public, or of open access to resource users) such as air, rivers, grazing land, and ocean resources are overexploited because in the absence of private ownership, it is logical for users to increase their exploitation limitlessly without worrying about the negative effects of such use. Dismissing the part of Hardin’s theory that explained how in many cases overexploitation was in fact rational behavior, many fisheries biologists and managers demonized fishers and painted a picture of them as irrational individuals whose only goal was to catch as many fish as possible, without any regard for the environment or society as a whole (Davis and Wagner 2003; Mackinson and Nottestad 1998). According to Hardin (1968), overexploitation of common pool resources, such as fisheries, could only be prevented by two state-established institutional arrangements—centralized government and private property. Therefore, many of the management regimes created in industrialized countries, such as the US, were based on this model. Moreover, it was assumed that all of the world’s fisheries, regardless of location or the way in which local fishers used them, were susceptible to the “tragedy of the commons” (thereby ignoring
complex local commons management regimes). Hardin’s (1968) theory was taken as scientific law by many researchers, and became (and, in many cases, continues to be) part of the conventional wisdom of several disciplines, including environmental studies, resource science and policy, economics, ecology, and political science (Feeny, et al. 1990).

By the early 1980s, however, anthropologists became important contributors to the commons literature by calling the “tragedy of the commons” theory (Hardin 1968) into question. Drawing upon years of ethnographic and other anthropological data, scholars such as James Acheson (1988), Bonnie McCay (1981), and Elinor Ostrom (Ostrom, et al. 2002) debunked Hardin’s statement that centralized government and private property were the only institutional arrangement that could function to prevent the overexploitation of common-pool resources. In his 1981 *Annual Review of Anthropology* article, Acheson described the variety of agreements and institutions used by societies throughout the world to control access to and utilization of common pool resources, including fisheries. These arrangements included: instances where secrecy and the management of information critical for fishing success operate as informal property rights (Andersen 1972; Forman 1967), cases in which limited access to particular fishing technologies determines who fishes where (Cordell 1974), cases where rights to fishing grounds are controlled by the national government (Lofgren 1979; Norbeck 1954), cases where fishing rights are unrecognized by the government and instead are only defended through informal local social sanctions (Acheson 1979), cases where fishing areas are owned by the entire community (Acheson 1972; Befu 1981; McCay 1980; Norr 1972), and cases where fishing rights are owned communally, but controlled by local leaders.
(Johannes 1977). The breadth of these cases challenged Hardin’s conclusions regarding
the inevitability of the “tragedy of the commons,” providing examples where property
regimes had been sustained for centuries without overexploiting resources (Dietz, et al.
2002).

Additionally, many of these case studies showed that, even in the absence of state
regulations and formal property rights, fishers develop their own cooperative, informal
rules that allow for the sustainable use of marine resources. Two of the most significant
ethnographic studies were those conducted by Acheson regarding the lobstering
communities of Maine (Acheson 1975a, 1975b, 1979, 1988) and those carried out by
McCay regarding the diversified fisheries of the Mid-Atlantic coast of the US (McCay
1980, 1981). These studies showed that although there were no formal private property
rights in place in the fishery, fishers in these locations used alternative ways to exercise
informal property rights and claims to fishery resources. Acheson’s research described
the many different facets of the Maine lobster fishery, providing great detail on the
“harbor gangs” and the strategies they used to protect their traditional fishing territories
from neighboring gangs or other outsider fishers (Acheson 1975a, 2003). McCay’s work
focused on how self-created fishing cooperatives of the surf-clam industry use particular
strategies to control fish landings by essentially controlling access to two important
resources—waterfront space and fishing grounds (McCay 1980, 1981). These studies
showed that informal property rights (often found in folk-managed fisheries, as described
below) can be present even in highly-commercialized fisheries in industrialized countries,
and prevent the theoretical “tragedy of the commons” from occurring because resources
are not truly “open-access.” The works by Acheson and McCay, along with scholars
from an array of disciplines, were extremely influential in that they showed that centralized management regimes were not the only viable option for the management of fisheries and opened the door for other types of management to be considered.

A second way fisheries anthropology studies have challenged the “tragedy of the commons” theory is through an examination of centralized fisheries management strategies. Marchak (1987) suggests that in many cases (particularly in the case of centralized management systems in industrialized countries) fisheries resources actually are not common property—they are state property because states determine the rules of access, appropriation, and allocation. Instead of the “tragedy of the commons,” she offers a “tragedy of mismanaged state property” (Marchak 1987:5), and many ethnographic studies have shown just that. Finlayson (1994) examines the errors and miscommunication within the scientific community that contributed to the rapid decline of cod stocks and the collapse and closure of the Newfoundland fishery in 1992. McGuire (1991) shows how authoritative language legitimated by state management bureaucracies contributed to declines in the productivity of tropical shrimp fisheries in Mexico. Durrenberger (1992) shows that the “overcapitalized” and overfished shrimp fisheries in the Gulf of Mexico have resulted not from the behaviors of individual fishers working in the commons, but from the motivations of processors and other actors striving for profits. In other words, state-managed, centralized systems are not necessarily the panacea for common-pool resource overexploitation as Hardin declared.

In a similar vein, fisheries anthropologists have also evaluated a fisheries management strategy commonly proposed by biologists and economists as the solution to the “tragedy of the commons:” Individual Transferable Quotas (ITQs). Putting aside the
debate regarding whether or not ocean resources are truly “open-access” (and therefore
doomed inevitably to the commons problems), fisheries anthropology has contributed to
the discussion by indicating that fishers do not make decisions based solely on economic
factors, but that social and cultural factors are important as well. ITQ strategies are based
upon the purely economic perspective that the solution to the “tragedy of the commons”
is to make the oceans and the resources therein private property (Olson 2006).

Neoclassical economic theory (at the most basic level) posits private property as the ideal
form for economic efficiency because it results in the least amount of wasted energy and
resources (Olson 2006).

Many fisheries economists perceive the greatest problem affecting commercial
fisheries is overcapitalization—too many boats and too many fishers. ITQs privatize
rights to a fishery through the distribution of quota-shares, which shareholders can then
buy, sell, or transfer as they choose. Inefficient shareholders cannot afford to continue to
operate, and must be bought out of the fishery, therefore reducing overcapacity. There
has been a great amount of support for this strategy in many industrialized countries
recently, and fisheries managers, therefore, cannot understand why such management
techniques are met with a great deal of resistance from fishers or otherwise fail.

Although there are multiple reasons why specific ITQ management regimes have
failed, fisheries anthropologists have shown that for those individuals whose entire lives
revolve around their experiences and identities as fishers, and for those communities that
are inextricably linked to the fishing industry economically, socially, and culturally,
much more is at stake than simply determining when one’s profits are outweighed by
costs (Colburn, et al. 2006; Russell 2003). Olson’s (2006) study shows that the way ITQ
strategies reduce fishers’ behavior to economic rationalities glosses over the heterogeneity that is found in a particular fishery, fishing community, and the industry overall. In order to understand whether and why a management strategy, such as ITQs, is accepted by fishers, it is necessary to examine multiple social relations, such as those of capital and labor, fishers and dealers, and men and women.

Studies like those mentioned above have called into question not only the ability of centralized government management regimes to successfully manage fisheries, but also the “science” and knowledge systems upon which many state management systems are based (King and Durrenberger 2000). The point is not to devalue science in general, but to acknowledge that the fisheries management models usually employed by the state are based on biological and economic data as it relates to the “tragedy of the commons.” If, as many ethnographic studies have shown, such a tragedy does not necessarily exist and, moreover, state regimes are not always able to manage fisheries successfully, then these models should not be presented as the best choices for management, regardless of local context. In light of this, scholars have examined other fisheries management strategies such as folk management, which is discussed in the next section.

Folk Management

Folk management systems are usually associated with smaller-scale, inshore fisheries, and the fish may be used for subsistence, to sell commercially, or both. In their seminal book, Dyer and McGoodwin (1994) define folk management as “any localized behavior originating outside state control that facilitates the sustainable

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3 Inshore fisheries are those in which shallow-water fish are targeted close to shore, as opposed to deep-water pelagic fish that are caught several miles from the shoreline.
utilization of renewable natural resources” (1). These fisheries are usually managed by local institutions and resource users, and can be managed by a variety of strategies and institutions that control and allocate the use and distribution of resources, including informal regulation of fishing space (Acheson 1988), supplies (McCay 1980), and the fish themselves (Russell and Alexander 2000). Additionally, these types of management systems have been found throughout the world, including Europe (Alegret 1996), Japan (Short 1989), the Caribbean (Stoffle, et al. 1994), and the US (Acheson 1987).

Although earlier works described folk management systems, throughout the 1980s, researchers increasingly focused on fisher folk communities and local institutions in light of the failure of top-down, centralized regimes to solve fisheries commons problems (as described earlier). This shift in focus to folk management strategies and institutions also reflected trends in the fields of conservation and natural resource management in the 1990s towards focusing on community-based resource management (CBRM) approaches. CBRM approaches emerged in reaction to the failure of protectionist, “fortress conservation” (Adams and Hulme 2001; Brockington 2002), which primarily involved the creation of protected areas, the exclusion of people as residents, the prevention of consumptive use, and minimization of other forms of human impact (Wells and Brandon 1992). Stemming partly from the realization of the limits of governments to coerce residents into participating in conservation and development projects, many community-based conservation models were created to provide those individuals and communities most directly dependent on natural resources with the

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4 Dyer and McGoodwin (1994) acknowledged that by that time (1994) there were numerous synonyms being used for folk management in the literature on fishing peoples, such as traditional management, localized management, and indigenous management. Following those authors, as well as Durrenberger and King (2000), I use “folk management” in this dissertation.
capacity to assume more direct control over the management of those resources (Bradshaw 2003; Davis and Wagner 2003; Olsson and Folke 2001). Supporters of these models argue that by placing decision-making closer to the location of resource use and giving resource users the opportunity to experience the consequences of their decisions, a favorable climate is created for more flexible and dynamic resource management. In addition, supporters contend that the opportunity to participate in local resource assessment and the development of management plans and regulations empowers local communities and increases the likelihood that those regulations will be followed (Bradshaw 2003; Zann 1999). In many cases, folk management systems were studied as models for how CBRM should be established, and presented as the new panacea for overcoming the “tragedy of the commons.” For many fisheries anthropologists, then, the goal of studying these management systems was to determine the conditions that would allow or prevent the development of community-based, localized management strategies in more industrialized, developed countries with large-scale fisheries.

One topic that has received considerable anthropological attention in this realm is local ecological knowledge, or LEK. LEK (also called traditional ecological knowledge, “TEK,” or indigenous knowledge) is defined as “a cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” (Berkes, et al. 2000:1252). One of the salient features of folk management systems is the use of resource users’ LEK, and over the past twenty years, environmental anthropologists have focused on how LEK can contribute to the conservation of biodiversity (Gadgil, et al. 1993), rare species (Colding
and Folke 2001), protected areas (Johannes 1998), and sustainable resource use in general (Berkes 1999). Throughout the 1990s and early 2000s, many anthropological and interdisciplinary studies showed the various benefits of using LEK in fisheries management (Aswani and Hamilton 2004; Gosse, et al. 2001). Hilborn and Walters (1992) showed that utilizing the LEK of the local resource users in conjunction with the Western scientific knowledge of biologists and ecologists can provide managers with a more accurate overall understanding of the environment. It can also provide a more general, “big picture” perspective of environmental cycles and trends than Western knowledge because it is based on many years- and generations-worth of accumulated observations and experiences (Gosse, et al. 2001; Mackinson and Nottestad 1998). Additionally, LEK can provide researchers with insight regarding how ecological knowledge is incorporated into a community’s cultural beliefs and practices (Berkes, et al. 2000). Furthermore, it can inform resource managers about the community’s social institutions and norms, worldview, and the mechanisms by which they function and are perpetuated in the community (Calamia 1999; Wagner and Davis 2004). It is suggested that if resource management plans are constructed in a way that takes this cultural information into consideration, the likelihood that local resource users will understand the goals of the plan is increased, as well as the likelihood that the regulations will be followed (McClanahan, et al. 2005). However, researchers have found many challenges associated with utilizing LEK in management plans including difficulties accounting for variation in LEK among local populations, as well as the many complex intellectual property rights issues to which the use of LEK may lead (Ellen and Harris 2000; Hunn, et al. 2003; Wenzel 1999).
Although the aforementioned studies described the advantages of using LEK in fisheries management and did a great deal to increase awareness of this kind of knowledge as a legitimate and valuable source of information, most of them suggested how it could be used within current management frameworks based on bio-economic models. Many fisheries scientists and other researchers offered suggestions for how to do this, such as inputting both types of knowledge into a computer program that considers both sources equally (Mackinson 2001), or using geographic information systems (GIS) to view spatial data from both forms of knowledge simultaneously (Calamia 1999).

Though these were valid attempts by those concerned with fisheries management to include LEK in the management process, they contributed to the dichotomy that had been created between Western, scientific knowledge and LEK. A complete discussion of this dichotomy is beyond the scope of the dissertation, but anthropologists continue to explore the relationships between these different knowledges, how they are formed, and how they can effectively and meaningfully be integrated to the benefit of resource management (St. Martin 2001; Wilson 2006).

In addition to helping guide discussions of how LEK and other elements of folk management can contribute to sustainable resource management in certain contexts, anthropologists have again offered important evidence for why folk management or other community-based approaches are not the ultimate panacea. For example, several case studies presented in Dyer and McGoodwin’s 1994 volume describe instances in which folk management strategies were not sufficient or able to prevent resources from being overexploited, regardless of the level of community involvement. Moreover, anthropologists have led important discussions regarding the impact external factors,
such as increased access to global markets, can have on the success of folk management regimes (Cinner and McClanahan 2006). Finally, on a more theoretical note, anthropologists have examined the assumptions and politics underlying the “ecologically noble savage” debate (Redford 1991), including an examination of why “indigenous” or “native” peoples are assumed to be natural conservationists—meaning they automatically and naturally develop ways to use their resources so as to ensure their long-term sustainability (Hames 2007).

This discussion of folk management in fisheries is relevant to this dissertation because St. Croix’s commercial fisheries share many characteristics with those fisheries throughout the world that are often managed using community-based, folk management strategies: they are small-scale, multi-gear, multi-species fisheries, with fishers who have extensive LEK. Despite these similarities, however, research indicates that socially-induced, informal or formal fisheries management institutions have not developed in St. Croix. This study examines the sociocultural, political, and economic factors that have resulted in the lack of folk management strategies present in St. Croix, as well as examines what this lack of folk management means for St. Croix’s commercial fishers and the extent to which they participate in the federal fisheries management process.

The next section describes a set of management strategies currently being promoted as a way to link centralized (such as federal) management strategies with folk management: “co-management.” I will explain the rationale behind these strategies, then describe the extent to which they are being promoted in St. Croix.

Co-Management

Building upon previous analyses of centralized and folk management systems for fisheries, anthropologists and other scholars have paid increasing attention to co-
management systems. Co-management has been defined as “the collaborative and participatory process of regulatory decision-making among representatives of user-groups, government agencies and research institutions” (Jentoft, et al. 1998:423). Such arrangements are seen to do away with the distant, impersonal, insensitive bureaucratic approach that often characterizes the role of government in centralized fisheries management (King and Durrenberger 2000). Instead, responsibility for management functions and policy-making is decentralized and delegated to different stakeholders at national, regional, and/or local levels, which instills a sense of autonomy for resource users within the overall institutional framework. Such an approach calls for a system of interactive governance and cooperative democracy through, for example, direct participation or representation at levels above and beyond local community boundaries (Jentoft, et al. 1998).

Co-management regimes attempt to bridge the gap between state-run, centralized management and local management. They have received a great deal of attention in the past ten years because of their ability to not only allow for the benefits achieved by community-based management approaches (such as increased compliance through participation in management, as previously discussed), but because the joint participation of local resource users, state officials, and researchers increases the legitimacy of management regulations (Pinkerton 2003). Additionally, co-management models seek to combine Western, scientific knowledge frequently used in centralized management systems with LEK from local communities and peoples (Berkes 1999). In other words, co-management systems are seen to have the potential to reap the benefits of both local and centralized management. There is no single model or structure indicated by “co-
management,” and there are various partnership arrangements, degrees of power-sharing, and levels of integration of local and centralized management systems. These include: “informational” management, where the state informs the users of decisions made; “consultative” management, where the state consults with the users before decisions are made; and “true” co-management, where both the state and resource users take an equal share and responsibility in management (Bennett 2005).

Inherent in each of these forms of co-management is variation in the extent of and type of participation of user groups. On one end of the spectrum there are management arrangements where there are various forums for dialogue between stakeholders and management authorities, but the management bodies still make the decisions. On the other end, there are arrangements where much of the management authority has been devolved to stakeholder groups, but the management authority remains in charge of specific aspects or management decisions (FAO 2012). In the US, the regional fishery management council system (described in detail in Chapter 5) provides opportunity for public comment, but the management authority still lies in the councils.

Co-management regimes for fisheries were first proposed in the late 1980s and early 1990s, stemming from studies regarding the ability of fishing cooperatives (self-organized groups of fishers) to effectively solve conflicts of interest and to handle management functions (Jentoft 1989). While studies of folk management systems (as described above) focused on informal management strategies and regulating mechanisms, studies of fisheries co-management focused on formal structures and institutions in place at the local level. For example, anthropologist Bonnie McCay’s (1980) study of a fishers’ cooperative in the New York Bight region of the Mid-Atlantic coast showed how
the cooperative used several regulating mechanisms to successfully control the price of the products sold by the cooperative. Similarly, Berkes’s (1986) study of a small-scale fishery in Turkey described how local fishing cooperatives actively participated in management and regulating activities. He concluded that if effective management is going to be achieved, local-level institutions, such as cooperatives, that allow consensus to be reached among fishers, are absolutely necessary.

Anthropologists and other social scientists have contributed important critiques to co-management discussions. In particular they have studied closely both the role of communities as well as the role of government agencies in co-management arrangements, recognizing the complexities and ambiguities that exist in forming a theoretical or working definition of each (Carlsson and Berkes 2005; Jentoft, et al. 1998). For this reason, they warn against the pitfalls of perceiving each entity as a single, unified body, and describe the challenges associated with developing effective co-management arrangements when in fact these entities often are heterogeneous and made up of groups with multiple perspectives, needs, and goals. Additionally, they have studied how the legitimacy of co-management regulations and strategies depends on the legitimacy of the fishers’ organizations involved (Jentoft 1989) and whether and how fishers’ organizations must change their structure and roles played in the management process in order to assist in the implementation of co-management regimes (Nielsen and Vedsmand 1997). Researchers have also examined the role of decentralization in co-management, questioning which management functions are best handled at local or communal levels, and which are best handled at national or centralized government levels (Pomeroy and Berkes 1997). Further, discussions of different co-management arrangements have raised
questions of representation, such as whether and to what extent particular user groups will be able to participate in the management process and to what extent individuals chosen to represent particular user groups or facets of a community are truly representative of the needs and concerns of the larger group (Jentoft, et al. 1998).

Building upon these anthropological critiques of fisheries management institutions that have evolved over time to address the commons dilemma, the next section will describe recent research trends in common property theory and fisheries management institutions. Additionally, I will also describe particular future research needs as suggested by important scholars in these fields. I will then explain how using a political ecology approach will allow me to address these future research needs through this dissertation.

**Studying Current Commons and Fisheries Management Institutions**

Recent reflections on Hardin’s (1968) “Tragedy of the Commons” theory by important social scientists of the “commons” (Basurto and Ostrom 2009; Berkes 2009; Carlsson and Berkes 2005; McCay 2002) describe the major transformations in the field and its approaches since the 1980s. These authors suggest the most significant change has been a shift from viewing the “tragedy of the commons” as an inevitability to viewing it as one of many possible outcomes resulting from natural resource use (Basurto and Ostrom 2009). Berkes (2009) explains:

Exceptions to Hardin’s model were coming from all parts of the world, covering various cultures and resource types—fisheries, wildlife, forests, grazing lands, protected areas, irrigation, and ground water. Cases were brought together in several volumes (McCay and Acheson 1987; National Academy of Sciences 1986; Ostrom 1990), necessitating the development of an entirely new theory of the commons (262).
This overall shift led commons scholars to focus on determining the conditions or “design principles” that contribute to successful management of common-pool resources, such as the predictability of ecosystem dynamics or overlap between where resource users reside and resource location (Baland and Platteau 1996; Ostrom 1990). These variables are often divided into two groups: (1) attributes of resources and resource users that increase the likelihood of self-organization (such as the availability of reliable and valid indicators of the condition of the resource system and the ability of users to determine access and harvesting rules without external authorities countermanding them), and (2) characteristics of self-governing systems (design principles) that are robust, meaning that they are sustainable over long periods of time (such as clearly-defined boundaries of the common-pool resource itself) (Ostrom 2002). Ostrom (2002) suggests that relative consensus has been reached among commons scholars regarding the characteristics included in each group, and Ostrom’s criteria are included in that volume.

This focus on which resource and community conditions are likely to lead to successful management arrangements has led skeptics to feel it useless and unnecessary to attempt to implement such regimes in locations that do not exhibit these particular sets of characteristics (Jentoft, et al. 1998). Additionally, scholars such as Agrawal (2002, 2003), McCay (2002), and Berkes (2009) have suggested that this approach of simply identifying conditions related to the success of community-based resource management strategies (including co-management) is insufficient. Agrawal contends that not only is the large number of “conditions” commons scholars propose problematic (in his 2002 chapter, he identifies between 30 to 40 variables that have been linked to robust common property institutions), but that the conditions are also insufficient because they lack the
appropriate attention to the larger context in which resource management arrangements
develop and in which they either thrive or fail. Specifically, he believes more importance
must be placed on factors such as markets, demography (such as the heterogeneity of
user groups), and the role of the state. In short, institutions do not develop or exist in a
vacuum, and the larger context must be taken into consideration.

McCay (2002) advocates a move toward historically grounded, ethnographic
examinations of fisheries management initiatives. She claims that studies of management
regimes should examine “competition and collaboration among social entities; the
embeddedness of individual and social action; and the historical, political, sociocultural,
and ecological specificity of human-environment interactions and institutions” (McCay
2002:362). Berkes (2009) suggests that in the past, many commons scholars “sought the
simplicity of community-based resource management cases to develop theory” (263)
because the local-scale commons made the processes of self-organization and self-
governance easier to observe (Ostrom 1990, as cited in Berkes 2009). However, the
approach Berkes critiques is no longer sufficient. Communities throughout the world are
becoming increasingly inter-connected due to the globalization of markets and economies
as well as through the increasing use of rapid communication technologies such as cell
phones and the internet. In light of this, it is virtually impossible to find such a “simple”
case in which a local scale common-pool resource is being managed through a folk or
CBRM regime operating devoid of the influence of external factors. Therefore, we must
examine how factors and conditions at various levels of social and political organization
affect one another. In this dissertation, I address the need for a multi-scale approach by
examining the relationships between the territorial and federal fisheries management
processes in St. Croix, and how these relationships impact how management is carried out at each scale. Utilizing such an approach allows one to better understand the extent to which commercial fishers and members of other stakeholder groups participate in the management process as well as the rationale behind their involvement (or lack thereof).

Co-management and other community-based approaches continue to be emphasized by researchers and managers as management structures with the most potential for long-term sustainable resource management (for many of the reasons mentioned previously). However, anthropologists and other social scientists stress the need to consider the larger issues at stake, such as which individuals and groups have the power to most influence the management process, the social construction of environments and resource management issues, and the multi-level political relationships that characterize resource management systems. Further, as local resources and communities are increasingly linked to the globalized world through international markets and large-scale resource use, we cannot afford to view local conditions as if they existed in a vacuum. Answering the call from Berkes (2009), McCay (2002), and Agrawal (2002), this is the approach I take in this dissertation. I not only seek to characterize the fisheries management system present in St. Croix, but to also understand how historical, social, and political factors at various socio-political levels affect the structure of the management system and how it is experienced by commercial fishers and other stakeholders. The next section describes how I will draw upon the field of political ecology in order to achieve these goals.

**Political Ecology of Fisheries Management Institutions**

Political ecology is a theoretical framework often used by scholars from many disciplines (anthropology, geography, political science, economics, etc.) to examine
relationships between humans and their environments. With roots in both political economy and cultural ecology, political ecology combines social and physical science perspectives in order to address environmental changes, conflicts, and problems (Gezon and Paulson 2005). Under a political ecology framework,

analyses of social relations of production and questions of access and control over resources—the basic tool kit of political economy—are applied in order to understand forms of environmental disturbance and degradation and to develop prospects and models for environmental rehabilitation and conservation, as well as environmentally sustainable alternatives (Paulson, et al. 2005:17).

As environmental issues continue to be at the forefront of local, regional, and global concerns, a framework that focuses on how human-environment relationships are impacted by differences in power and influence among human groups at different scales is extremely important. Such a framework allows researchers to challenge dominant interpretations of the causes of environmental degradation as well as the commonly recommended solutions for solving those problems.

Researchers have examined fisheries management issues using a political ecology perspective, but, paralleling a similar trend in political ecology overall, most of this research has focused on case studies from developing countries (Gezon 1999; Meltzoff 1995; Polioudakis and Polioudakis 2000; Schroeder, et al. 2006). In addition, most of these case studies have focused on CBRM approaches, exploring and questioning notions of “community” used in these strategies, examining the relationships between Western fisheries science and LEK, and deconstructing how those in positions of power often define these concepts in ways that allow them to gain and retain control over natural resources and local people (Brosius, et al. 2005; Robbins 2004).
Recently, however, political ecology has been increasingly used to examine natural resource management in industrialized countries. Schroeder et al. (2006) describe this application of what has traditionally been “Third World political ecology” to the “First World” as “going global” (163).\(^5\) Countering a main critique of political ecology—that the field lacks a well-articulated and prominent set of core themes—Schroeder et al. (2006) suggest that the emergence of core themes is occurring, evidenced by current First World political ecology research building upon and extending those insights gained in the Third World. Additionally, they suggest that in the application of political ecology theory to First World (in this case, primarily North American) cases, scholars are reconceptualizing First World research sites:

[This] approach begins by rejecting the First World/Third World binary altogether. Rather than discover the Third World within, this approach, post-structural in leaning, “re-reads” the First World for heterogeneity and diversity, asserting that spaces we have always assumed to be purely capitalist always carry within them the elements that we now commonly associate with the Third World (Schroeder, et al. 2006:166).

This approach alters the binary manner in which we perceive natural resource management in the First and Third Worlds. Instead of viewing sites of resource use as existing in only one kind of space—either the First or Third World—these sites, and the communities dependent on them, can be seen to exist in a less black-and-white world, somewhere along a continuum between the two. By viewing them in this manner, the suite of regimes and institutions considered appropriate for their management in both contexts can be altered and expanded as well.

St. Martin (2005) describes this approach as it relates to fisheries management in the First World and the Third World. He contends that First World fisheries are perceived

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\(^5\) Although I would prefer to use the terms “developing” and “developed” in place of “First World” and “Third World,” I am using Schroeder, et al.’s (2006) and St. Martin’s (2005) terminology.
as elements of a capitalist economy that is all-encompassing (Gibson-Graham 1996; St. Martin 2005). From such a perspective, the solution to fisheries management issues such as overfishing lies in privatized, rationalized, and corporate industrial practices. Additionally, St. Martin (2005) describes the dominant belief that “to not pursue the capitalist solution of fisheries science [in the First World] is to condemn fisheries either to the poverty of underutilization as in primitive locations or, after the advent of industrial technology, to the inevitable poverty of overfishing” (966). In Third World settings, St. Martin contends, there are several options for what fisheries management can and should look like. While in some sites the industrialized, capitalist solution may be the goal, community-based, cooperative, and artisanal (to name a few) arrangements are also viable and preferred options. In First World settings, however, although these alternative management strategies are often promoted as the arrangements fisheries managers should be working to implement, this perceived divide between the First and Third Worlds means that they can never actually be realized within First World industrial fisheries (St. Martin 2005).

I build upon the application of political ecology to fisheries management issues in industrialized countries and the associated challenges to the First World/Third World binary. St. Croix, and the US Caribbean in general, is in a precarious position in terms of fisheries management. It is a US territory and subject to the US federal fisheries management system. This system is primarily based on an industrialized management model, and, in fact, most US commercial fisheries are large-scale, species-specific, industrialized fisheries, striving toward maximizing economic profit. St. Croix’s commercial fisheries, as will be shown, are different. They are small-scale, multi-species
fisheries with little exportation and vastly different challenges than most US industrialized fisheries. As such, one can argue quite reasonably that the federal system is not well-suited to manage fisheries in island territories like the USVI (and others, such as American Samoa and Guam). While I will stress this point, I also utilize and build upon Schroeder, et al.’s (2006) and St. Martin’s (2005) contention that resource management scholars must move beyond the First World/Third World divide. This will allow me to not only describe the mismatch between the US federal system and St. Croix’s local fisheries, but will also allow me to uncover the conditions and local context which operate to perpetuate this mismatch and keep this system in place. Moreover, we can begin to conceive of other management models, aside from those previously developed for industrialized systems that may be more appropriate and more effective for sites like St. Croix.

Also important to an examination of multi-scale fisheries management in St. Croix is the consideration of political influence and other forms of power. Biersack (2006) suggests that political ecology allows one to move beyond the positivist question of whether a particular representation of “reality” is accurate, and instead one can focus on what reality is being constructed, by whom, for whom, for what political purpose, and to what political effect. Related to this focus on whose reality is being constructed and for what purpose, political ecology studies have specifically focused on how nature and human-environment relationships are constructed. In this way, the field has moved beyond the nature-culture dichotomy common to the belief systems of many
industrialized nations, and instead focuses on what can be called “second nature.” If “first nature” is that nature that is original, primal, and pristine, and that exists independently and unaffected by human activity, then “second nature” is that nature that is affected by and results from human activity and constructions, what Escobar (1999) calls “after nature” (see also Strathern 1992). Many political ecologists embrace the idea that “nature is always constructed by our meaning-giving and discursive processes, so that what we perceive as natural is also cultural and social” (Escobar 1999:2). From such a perspective, it is possible for political ecologists to produce what Biersack (2006) calls “ethnographies of nature.” Such ethnographies describe the intersections of culture and nature as they are constructed through human activities, conceptualizations, values, and social relations. This allows scholars to move beyond simply describing how this “second nature” is constructed, and allows them to also examine who (individuals or social groups) has the power to control the way it is constructed, as well as the way it is discussed (through control over discourse) (Gezon and Paulson 2005). These perspectives will allow me to not only examine the conception of fisheries management in St. Croix, but also to explore which individuals or groups have the power to control how the process is carried out and experienced by commercial fishers and other stakeholders.

Political ecologists also assert that in order to understand the relationships between humans and their environments, as well as how “second nature” is constructed, scholars must frame, carry out, and analyze their research across different scales—the local, the global, as well as those spaces in between (Paulson, et al. 2005:32). Early

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6 According to several researchers, such as Escobar (1999), the nature-culture dichotomy resulted largely from the growth of industrialism and capitalism, as nature came to be seen as a commodity to be used for human consumption and gain.
political ecology studies recast the capitalism of political economy on a global scale, viewing the local as part of a global system of power relations. Political ecology insists that local-level analysis is not adequate, and instead focuses on the dynamics of the relationships between the local and the global, what Ong (1999) refers to as “the transversal and transnational… the horizontal and relational” (4). Others (Biersack 1999, 2006; Dirlik 2001; Escobar 1999) use the word “place” to mean the site of local-global articulation and interaction. Although a complete discussion of the concept of “place” is beyond the scope of the dissertation (for a complete discussion, please see Rodman 1992), what is important to note is that such a focus on different scales, the relationships between the global and the local, and how they influence and are affected by one another allows political ecologists to study large-scale processes such as globalization and the affects they have on local people and communities. This focus on multiple scales and the interactions of individuals and groups across levels is especially important for an analysis of fisheries management in St. Croix, which is characterized by a lack of separation between fisheries management at the territorial and federal levels.

Additionally, related to political ecology’s focus on how nature and reality are constructed, and which individuals or social groups are in a position to control these constructions, is a focus on social differences and inequalities. According to geographer Karl Zimmerer (2000), “Political ecology seeks to contribute both to sound environmental management (nature conservation) and to the empowerment of disadvantaged social groups” (357). Political ecologists look beyond the class inequalities of classical Marxism, examining how unequal social and political power due to differences in gender, ethnicity, and other elements of identity influence the dynamics
of ecological systems. This perspective is especially critical to the dissertation because it allows one to examine how these inequalities influence fisheries management today. For example, the island’s colonial past and the resulting patterns of ethnic relations continue to impact relationships among ethnic groups in St. Croix today. As such, they play an important role in how individuals and groups perceive marine resources as well as their experiences with and level of participation in the fisheries management process.

Additionally, the wide-spread intermigration that occurred throughout the Caribbean in the 1900s, and the relationship among these migration patterns, the island’s economic development, and the political relationship with the United States continues to impact the way that ethnicity, culture, and education influence the composition of and interaction among marine resource stakeholder groups. Ultimately, integrating political ecology with commons management and fisheries anthropology will allow for an in-depth assessment of these complex relationships.

**Objectives of the Dissertation**

The dissertation objectives are as follows:

1) *To examine how the practice and importance of fishing in St. Croix—historically, economically, and socioculturally—have changed over time, and how those changes impact fishers today.*

This objective stems from McCay’s (2002) call for a more historically-grounded, ethnographic examination of fisheries management institutions. In order to understand fisheries management in St. Croix currently, we must examine the history of fishing behavior in St. Croix as well as the importance of fishing to the various societies that occupied the island at different times throughout history. This will help us understand how specific aspects of the island’s history, such as colonialism, the plantation economy,
slavery, and inter-migration, helped shape the relationships between ethnic groups as well as residents’ dependence on fisheries resources to fulfill economic, dietary, and sociocultural needs. Additionally, this historical perspective allows a better understanding of social conditions today, including the relationships between historical ethnic and political patterns and the relationships between marine resource stakeholder groups.

ii) To document the current structure and practice of fisheries management in St. Croix in order to understand the regulations that shape fishers’ behaviors and how management decisions are made.

Building upon the aforementioned anthropological critiques of fisheries management institutions, I describe how the typology of fisheries management institutions presented earlier relates to the structure and practice of fisheries management in St. Croix today. A description of the territorial and federal management structures will be provided, as well as a description of the overlap that exists between these two management systems. Additionally, it will be important to examine how territorial and federal fisheries management is actually conducted in St. Croix and to compare that data with how the processes are legislated to be conducted. Included in this discussion is an examination of the extent to which commercial fishers and other stakeholders participate in the management process, how they participate, and what historical, political, and social factors impact their participation.

iii) To examine how social relationships and the organization of the fishers affects whether and how they participate in the management process and the extent to which they influence management decisions.

This objective builds upon the common-pool resource literature regarding resource users’ self-organization. I will examine the extent to which commercial fishers and members of
other stakeholder groups participate in the management process. Although St. Croix fisheries possess several characteristics that commons theorists propose to be related to resource users’ self-organization and robust self-governance systems (Ostrom, et al. 2002), research suggests that such institutions do not exist there. Moving beyond commons theory that seeks to define a set of specific variables that best predict sustainable self-governance, this dissertation provides an opportunity to examine why self-governance, even informally, does not exist. Moreover, connections between fishers’ organization and their participation in the management process will be examined. iv) To examine fishers’ experiences, perceptions, and responses to recent efforts by US NMFS to encourage their participation in the fisheries management process.

This objective focuses on the extent to which commercial fishers in St. Croix are being encouraged to participate in the federal fisheries management system. As will be described in Chapter 5, the National Marine Fisheries Service (NMFS) and the regional fishery management councils present the management system as a democratic and participatory process. With this objective I seek to examine how public participation occurs in St. Croix, as well as fishers’ and others’ perceptions of the extent to which their participation influences the management process. Further, I examine how the extent of their participation and their perceptions of the fisheries management process are related to social and political factors historically as well as at present. Much of the research to date regarding public participation in the US federal fisheries management process has taken place in regions of the US that have primarily large-scale, industrialized fisheries, such as the northeast region. Moreover, much of the participation of fishers and others in these regions is facilitated through fishers’ organizations and other community groups. This dissertation builds upon this research in order to determine whether and how
commercial fishers and members of other stakeholder groups participate in the management process when well-organized groups do not exist and when informal, socially-induced commons management strategies do not exist.

v) To examine how these efforts by NMFS intersect with global trends towards the decentralization of management of natural resources, and how these processes impact the livelihoods of local fishers of St. Croix on a daily basis.

This objective stems from the natural resource management literature (such as Ribot and Larson 2005) that examines the large number of decentralization reforms that have occurred throughout the world since the mid-1980s, often intersecting with efforts to promote CBRM and, more recently, co-management. Prior to my fieldwork, I viewed the US federal fisheries management system as a potential example of this movement, and believed the context in St. Croix might mirror that in other regions such as the northeastern US, from which researchers have presented case studies of the movements toward decentralized management and co-management (Hall-Arber 2005; Pinto da Silva and Kitts 2006). Early in my fieldwork, however, it became clear that this was not the case, and that the federal fisheries management system was experienced very differently by fishers from St. Croix than by fishers in other regions. Very few fishers participated in the process, those that did participate did so ineffectively, and little was done by NMFS or the Caribbean Fisheries Management Council (CFMC) to promote their participation or decentralized management. For this reason, I shifted the focus of this objective toward an examination of what prevents participation and decentralization from occurring in St. Croix, as well as the impact the absence of these elements has on the local commercial fishers.
Chapter Summary

In this chapter, I presented the theoretical framework I use in this dissertation to conduct a critical examination of fisheries management in St. Croix. Building upon the anthropological critiques of common pool resource theory and fisheries management institutions presented here, I will examine the mismatch that exists between St. Croix’s small-scale, multi-gear, multi-species fishery and the federal fisheries management system in which it is embedded. Additionally, utilizing political ecology’s multi-scale approach will allow me to describe the complex relationship between territorial and federal fisheries management and how the island’s commercial fishers experience and perceive management processes. Furthermore, by using an ethnographic and political ecology approach to examine the historical, social, and political factors that impact how fisheries resources are managed in St. Croix, I am able to answer the current call for research that thoroughly considers the relationships between local conditions and the socio-political management context in which they are embedded. In the next chapter, I present the methods I used to collect data to address the research objectives outlined here.
CHAPTER 3

METHODOLOGY: AN ETHNOGRAPHIC EXAMINATION OF COMMERCIAL FISHING IN ST. CROIX

Chapter Overview

Field research for this dissertation was conducted between March 2009 and November 2010. In this chapter, I describe the ethnographic methods utilized to collect the data, as well as discuss important methodological decisions that were made based on the highly contentious nature of commercial fisheries management in St. Croix. Additionally, I explain why, due to this contentiousness and the widespread mistrust commercial fishers, territorial managers, and members of the other stakeholder groups included in the study have for non-resident, “outsider” scientists, qualitative methods such as participant observation and informal interviews proved to be absolutely essential to my research. The research design is also presented, including the research questions, sampling strategies, and methods of data collection and analyses. I also describe the study participants, highlighting the sampling strategies used and how the small number of individuals involved in fisheries management in St. Croix impacted the research design and analyses employed.

Selection of Research Site and Prior Research

The site selected for the study is St. Croix, United States Virgin Islands (USVI). I chose this as the study site for two main reasons: (1) the island has a long history as a center for fishing-related activity and (2) I conducted two previous pilot studies regarding
commercial fishing in the USVI which provided background for the development of the research and a grounding in the specific details of fisher practices. As will be discussed in subsequent chapters, fishing has been important to the islands’ residents throughout history, beginning with the Arawaks and other indigenous residents around 3000 years ago (Johnstone 2001) and continuing into the present. It is important to the residents of St. Croix for many reasons—it provides jobs and food resources, as well as a foundation for cultural identities—and close to 100 percent of landings caught by commercial fishers are sold on the island (Stoffle 2006). This means that a large portion of the money that is made on the sale of fish circulates throughout the island and supports the island’s economic stability. Additionally, it indicates that the fishing industry directly or indirectly affects all island businesses and residents economically, socially, and culturally. For these reasons, St. Croix is an appropriate site in which to examine how the federal fisheries management system is carried out at the local scale and how the island’s commercial fisher and members of other stakeholder groups experience the process. Furthermore, as the following chapters will describe in more detail, these connections between individuals and groups within the island community and the marine resources continue to influence how fisheries management is conducted today.

**Description of Prior Studies**

I conducted two previous pilot studies regarding commercial fishing in the USVI. These provided background for the development of my research as well as a grounding in the specific details of fisher practices.

The first of the aforementioned pilot studies was carried out in September 2005 in conjunction with the National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center’s Social Science Research Group. This study examined local fishers’
perceptions of implemented and proposed marine protected areas in nearby waters. Although this research was carried out in St. Thomas and not St. Croix, it provided me with the opportunity to familiarize myself with the USVI in general, the local fisheries, and the ways fisheries regulations affect the communities. The second pilot study was conducted in July 2008 in St. Croix. This study, also conducted in conjunction with the Social Science Research Group, examined the economic costs associated with being a local commercial fisher. This study was developed to provide NMFS with data that could be used to assess the impact proposed changes to fisheries regulations could have on local fishers and the island community of St. Croix. This visit provided me with the opportunity to familiarize myself with the island, the fisheries, and the specific challenges fishers are currently facing, such as closed marine areas and restrictions on particular types of fishing strategies.

During this visit to St. Croix in July 2008, I informally interviewed several fishers and local residents regarding how they are being affected by changes in fisheries regulations. Through these conversations I learned of a controversy that was impacting (and continues to impact) many of the commercial fishers on the island. In April 2008, the USVI government decided to enforce a ban of the use of gill and trammel nets by St. Croix fishers—a technology that was used by several full-time commercial fishers. Learning of the government’s intention to do so, the island’s net fishers worked together to create their own management plan to limit their use of the nets. However, the government of the USVI was pressured by environmental NGOs to ban the use of the nets completely, and the fishers’ plan was ignored. This suggests that although local fishers in St. Croix are encouraged (and allowed by law) to participate in management
processes, when they make attempts to do so, their efforts are trumped by other stakeholder groups in the name of conservation. Learning about this controversy led directly to my research plan, which examined the political and social processes involved in this and similar decisions and their impacts on fishers’ livelihoods. Overall, this visit allowed me to forge relationships and establish rapport with individuals involved in the fishing industry as well as other community members, many of which proved invaluable to me during the course of my dissertation research.

**Issues of Confidentiality**

As described below, fisheries management in St. Croix is a highly contentious topic. Spurred by years of tension among Crucian fishers, territorial managers and scientists, and federal managers and scientists, it was critical that I considered participants’ concerns regarding the confidentiality of the information and opinions they shared with me. Several of these considerations are described in this section.

**Informed Consent**

It is impossible to discuss fisheries research in the USVI without mentioning the challenges associated with doing so due to the great mistrust commercial fishers have for federal fisheries managers and anyone conducting research that involves the resources upon which they depend. My first experience with this came during my visit to St. Thomas with the Social Science Research Group in 2005. Although some of the commercial fishers were willing to participate in the interviews, many of them were not. The reasons individuals gave for not wanting to participate varied. Some stated they were busy and did not have the time, even when it appeared they were just hanging out at the dock or market chatting with friends. Others were more up-front with their refusals, stating that they did not want to be involved with “the feds” in any way. Regardless of
the stated reason, what was clear was that we, as researchers, were not welcome in their community spaces. In an attempt to help build rapport with the commercial fishers and their organization, our research team attended a social community event being held by the organization. For the most part, we were simply ignored by the other attendees, but on a few occasions, members of the fishermen’s organization stated out loud that we were not welcome there. Although at the time I did not understand the complexities of the relationship between the commercial fishers and NMFS, I was surprised to see such a reaction, especially since I believed we were the “good guys,” who were trying to look out for the fishers’ best interests and to protect their resource-dependent livelihoods.

My experience in St. Croix in 2008 was slightly different. Overall, the fishers there were much more willing to speak with us and to participate in the interviews. This gave me the opportunity to not only conduct longer and more open and honest interviews with the fishers, but to also speak with them informally regarding their concerns about their local fisheries and the way they are being managed. Several fishers explained to me that they felt federal fisheries managers’ main goal was to shut the fisheries down no matter what, and that they were ignored even when they tried to participate in the management process by making suggestions based on daily, localized experiences and presenting management plans developed by the fishers themselves. Although in general these individuals were more willing to participate in our research and many afforded me insights into why they mistrusted anyone associated with NMFS, their behaviors still showed that they were skeptical and uneasy about the intentions of our study. This was evidenced by questions and comments such as, “Are you guys going to use this
information to shut us down?” and “I’m not going to tell you that. They’ll know I’m the one who said it.” Similar comments were repeated throughout our fieldwork.

Based on these prior experiences, I understood just how contentious fisheries management issues were in St. Croix, and that it would not be easy to find individuals from all stakeholder groups to participate in interviews for my dissertation research. When developing my research proposal, I thought about what steps I could take to help potential participants feel comfortable speaking and interacting with me, both formally (e.g., during semi-structured interviews) and informally (e.g., when I was conducting participant observation by going on fishing trips with them or when spending time at the fish market). I felt it was very important to keep the participant recruitment and informed consent processes as simple and informal as possible. For this reason, when I submitted my research proposal to the University of South Florida (USF) Institutional Review Board, I filed for a waiver of documented informed consent, which was subsequently approved. This meant that I was not required to have participants sign a document stating they agreed to participate. I would still be required to obtain informed consent verbally from participants, and would be responsible for recording who gave their informed consent. My hope was that potential participants, most of whom I assumed would know little about the ethics of confidentiality associated with scientific research, would feel more comfortable discussing personal information and opinions with me if they believed their statements would remain completely anonymous. Additionally, this waiver of written consent would allow me to receive verbal informed consent from participants who were unable to read and/or write.
Conducting Interviews Without Audio Recording

Although not ideal, the controversial nature of fisheries management in St. Croix as well as the small number of commercial fishers and others that are currently involved in fisheries management meant that I had to forego audio recording the semi-structured interviews I conducted. While I hoped to record the interviews so that they could be transcribed and analyzed using a qualitative analysis software package, based on my prior research trips to the USVI, I knew that recording the interviews could greatly impact the kind of information interviewees provided, as well as the candidness with which they responded. When I arrived, I discussed this point with a few key informants who were familiar with the kind of ethnographic research I planned to conduct. Based on these early conversations, I decided it would be best for me to not record the interviews. Due to the great lack of trust most commercial fishers in St. Croix have for scientists, as well as the lack of trust commercial fishers and territory fisheries managers have for “outsiders” like myself, it would be quite challenging for me to gain the trust and respect of any of the individuals I hoped to interview. I hoped to alleviate some of the resistance of interviewees to speak honestly with me about their experiences with territorial and federal fisheries management by only taking notes during interviews. While this ultimately limited the types of analyses I was able to perform with the interview data, I am certain I made the best choice for my research objectives. Additionally, on several occasions when I was conducting semi-structured interviews, participants (commercial fishers as well as those from other stakeholder groups) asked me to not write down what they were saying, so that the statements were not recorded in writing. While this lack of recording meant that I was unable to directly use these responses in my analyses, these “off the record” statements provided me with important general information regarding
participants’ perceptions and beliefs. I am certain that the information participants had
provided me with would have been much more limited had I insisted the interviews be
taped.

**Research Design**

This section describes the overall research design of the dissertation. I begin by
presenting the research questions that stem from the theoretical literature and research
objectives presented in Chapter 2. I then describe each of the data collection methods
employed in the study, including (1) literature review and archival research, (2)
participant observation and informal interview, (3) participant observation at meetings,
and (4) semi-structured interviews. Next, I describe each of the stakeholder groups
included in this study, highlighting the limited numbers of stakeholders from which I
could draw. I then describe the data analysis techniques used and how the relatively
small sample size influenced the choice of techniques. Finally, I conclude the chapter
with a discussion of my positionality as a woman conducting research primarily with men
and the implications for this study.

**Research Questions**

In order to achieve the research objectives presented in Chapter 2, I formulated
the following research questions:

1. What is the social, economic, and historical role of fishing in St. Croix?

2. What is the current structure of marine fisheries management in St. Croix?

3. How are fisheries management decisions made at different scales, and do
commercial fishers participate in this process? Why or why not? To what extent
do fishers and other stakeholders perceive their participation to influence
management decisions?
4. How do social relationships and the organization of the fishers affect the extent to which they participate in the management process and influence management decisions?

5. How does the structure of the federal fisheries management system affect the extent to which the fishers and other stakeholders are able to influence management decisions?

To answer these questions, data collection consisted primarily of archival research, participant observation, observations and fisheries management meeting, and semi-structured interviews. Each of these methods will be described next.

Data Collection

Literature Review and Archival Research

In order to prepare for my field work in St. Croix, I spent several months before my departure conducting an extensive literature search. The literature review focused on the main theoretical concepts I would use to frame my dissertation research, including fisheries anthropology, critiques of fisheries management institutions, common pool resources theory, and the political ecology of conservation and natural resource management. The literature review of these topics included searching USF’s library catalog, including its collection of books, academic journals, and electronic databases and other resources. Additionally, I reviewed documents, reports, and articles available on the internet, as well as those to which I had access because of my previous research and contract work conducted with the National Marine Fisheries Service (NMFS).

Additionally, the archival research focused on the ethnographic description and historical contextualization of St. Croix, the USVI, and the Caribbean region. I used the same basic methods to gather this location-specific data, but came up with much fewer results. When compared with other islands in the Caribbean, such as Cuba, Jamaica, Barbados, or Puerto Rico, little has been written about the USVI, and even less about the
island of St. Croix in particular. Extensive literature review reveals that while there have been several historical accounts written about the USVI (or the Danish West Indies, when referred to prior to 1917), the islands have received little attention in recent years. Of those sources I found which focused on the USVI, I would classify most of them as history books for the general public which merely relayed the major events of the islands’ past rather than offering a critical examination of how historical events or conditions might relate to current ones. Few of them mentioned St. Croix specifically (instead referring to the Danish West Indies or USVI as a whole), and only a handful could be considered academic sources or peer-reviewed research articles. For this reason, the bulk of my literature review that provides a critical examination of St. Croix’s history and its relationship to the other United Statres (US) Virgin Islands and other islands in the Caribbean region comes from sources found and data collected while in the field.

Once I arrived in St. Croix, I continued my literature search utilizing the libraries and reference collections that were available to me. These included the St. Croix Landmarks Society Research Library and Archives, the University of the Virgin Islands Library, the USVI Division of Fish and Wildlife (DFW) Library, and the Christiansted and Frederiksted Public Libraries. These collections were very important to my research in that they provided me with the opportunity to examine historical books, manuscripts, maps, artwork, and photograph collections not available through any other means. Additionally, I was able to find and utilize some of the earliest descriptions and assessments of USVI fisheries and other marine resources, which has proved invaluable to this study.
In addition to historical information, my ongoing literature review and archival research provided me with a great deal of information relevant to my research questions. Documents, reports, and minutes from public meetings held in the DFW Library helped me to understand the current structure of fisheries management in St. Croix and how it is conducted on a daily basis. Additionally, these reports provided me with insight regarding the relationship between territorial and federal fisheries management, and how decisions made at one level influenced those made at the other.

**Participant Observation and Informal Interviews**

As with many ethnographic studies, participant observation and informal interviews (Bernard 2006; DeWalt and DeWalt 2002b; LeCompte and Schensul 1999b) proved extremely important to my research. These two forms of data collection often occurred together and so are discussed together in this section. Participant observation occurred on several levels. First and foremost, it allowed for the integration of my husband and I into the island community. From the time we moved to St. Croix in March 2009, we made every effort to enter into and become a part of island “culture.” We were especially cognizant of any local customs, such as greeting anyone you pass or meet with “good morning,” “good afternoon,” or “good night,” depending on the time of day. Similarly, we adapted to driving quite slowly, and stopping frequently to allow other drivers onto the road in front of you, signalling for them to do so with a polite honk of the horn.

My husband and I found a long-term apartment and jobs within the first month of our arrival, which helped integrate us into the island’s workforce, distinguishing us from visitors who come to the island solely for relaxation. My husband began working as a
diving instructor for one of the dive shops, and I began working as a kayak guide for an ecotour and dive operator located in Salt River National Historic Park and Ecological Preserve. Although my working for an eco-tour operator had the potential to hamper my ability to remain unbiased toward any particular stakeholder group whom I would be interviewing, the need for me to work and earn money to contribute to our household income was unavoidable. When I first met the owner of the tour company, I was completely up-front about the main reason I had moved to St. Croix, and indicated from the beginning that I intended to ask her and her employees for a semi-structured interview for my research several months down the line. I was also clear about the kind of research I would be conducting, explained about the importance of participant observation to my study, and that these observations would be occurring on a daily basis as I performed my job duties. I was also up-front in a similar manner with the owners of the dive shop my husband worked for, indicating to them that I hoped in the future they would allow me to interview them. My intentions continued to be transparent, even when after several months I began to work in the dive shop booking dive trips and selling dive gear and clothing.

Although I was working these jobs out of necessity, so that my husband and I could afford to live in St. Croix long enough for me to complete my research, the day to day events that occurred at these workplaces provided me with a great deal of insight into the attitudes and perceptions of those involved in the diving and tourism industry on the island. I was able to gain a great deal of knowledge regarding how the dive shops on the island operate as well as what challenges they face in running their businesses. Also, simply being there on any given day provided the opportunity for many informal
conversations to occur with and between the owners, managers, other employees, or clients of the shops. Many people asked me questions about why I moved to St. Croix, which gave me the chance to explain to them what I was researching and why I thought it was important. Quite frequently, just mentioning “fisheries management” was enough to elicit lengthy responses regarding personal attitudes, opinions, and experiences with fish and fishing on St. Croix and all over the world. These data were very important to my research in that they provided insight into how a wide-range of individuals perceived fisheries management to be occurring in St. Croix, and proved to be an important supplement to the data I gathered through more formal semi-structured individuals with targeted individuals.

Additionally, observing the individuals who owned and worked for the dive shops on a daily basis allowed me to understand their opinions toward fishing and fishermen in greater depth. For example, I was able to observe their behaviors toward fishermen who used the dive shops’ scuba tank air fill services, but was also there after the fishermen left to hear any remarks the employees might make about them. As such, this participant observation allowed me to compare individuals’ behaviors and actions with their stated opinions and beliefs gathered during their formal interviews.

While working for local businesses helped my husband and I integrate into island society, it became quickly clear that it is possible to live in St. Croix and work in the tourism industry, and hardly ever interact with any of the black West Indian or Puerto Rican locals. The majority of the businesses frequented by tourists visiting St. Croix, who come mainly from the United States and Denmark, are owned by white people.
Most of them are white “Continents,” who relocated from the US mainland. Although local West Indians and Puerto Ricans visit these tourist businesses, such as the dive shop at which I worked, they account for a low percentage of the customers. Therefore, it is entirely possible to work at one of these businesses, visit shops and restaurants only owned by white people, and hardly ever interact with individuals of a different ethnicity.

With this in mind, it became very important to me that I step out of this separate white culture on the island. I made purposeful efforts to go to the local restaurants to eat local West Indian and Puerto Rican food, to shop at grocery stores owned by locals where other locals shopped, and to do my best to “act local.” Everywhere I went, I did not want people around me to assume I was just like all the other white people on the island. Towards that end, it was amazing how much a difference it made to look everyone I passed on the street or at the gas station in the face and to say “good morning” to them, instead of putting my head down and ignoring those around me who did not look like me. I felt this was a very important part of integrating more completely into the island culture, as opposed to staying within my comfort zone and only interacting with the other white people on island.

Perhaps the most important aspect of participant observation for my research was that involving the commercial fishers. Beginning the first week we arrived in St. Croix, I visited the fish market several times a week, for a total of approximately 200 market visits throughout my tenure on the island. The length of these visits varied from 15 minutes to several hours, depending on how busy the market was and who was there.

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7 This is the term used locally to refer to white people from the mainland US who relocate to St. Croix.
8 The “fish market” to which I refer is a set of make-shift wooden stands a small group of fishers have built in the parking lot of the government-built La Reine fish market, which was closed for sanitation reasons in 2007. This is discussed in more detail in Chapter 9.
During the first few months, these market visits were primarily aimed at observing who was there and what they were doing, who interacted with whom, seeing what kind of fish and how much they brought to sell each day, and how they marketed and sold their fish to customers. Although a few of the fishers knew that I was visiting the market because I was doing research for my university, I did not ask them for interviews right away. I just wanted to observe and become friendly with them first, instead of asking them right away to do the more formal semi-structured interviews. However, if anyone asked why I was there or why I moved to St. Croix, I was up-front with them and told them what my intentions were. I would tell them that I had been to St. Croix and the fish market a few years ago with researchers from NMFS, but that now I was living here just for my own research, and that I was not going to be doing the interviews for NMFS or the Department of Planning and Natural Resources (DPNR).

Being at the market so frequently allowed many of the fishers, sellers, and regular clients to become accustomed to my being there, and to feel comfortable going about their daily activities with me around. It also provided me with an opportunity to meet many of the fishers who did not usually sell at the market, but would stop by to say hello to the folks who were there. Additionally, being at the market so frequently allowed opportunities to arise in which I could observe and/or participate in informal conversations regarding fisheries management. For example, once in a while someone from DPNR would come by to measure and weigh fishers’ catches (“port sampling”). This provided me with the chance to observe how the fishers interacted with DPNR employees, as well as to hear the comments they made regarding them before they arrived and after they left. Alternatively, I was there quite often when impromptu
discussions occurred regarding proposed new regulations (both territorial and federal) or when news would come that fishers had been caught using illegal gill nets. Again, these instances allowed me to observe and listen to fishers’ reactions to these events and to gather information regarding their opinions on these matters. Also, because they were used to me being there and participating in conversations regarding fisheries issues as well as normal day-to-day conversation, I was able to ask questions in these instances about their opinions and perspectives and received what I believe to be very candid responses.

I also made every effort to go to the fish market for several hours every Saturday, which is the biggest market day of the week. As stated above, these visits allowed me to observe fishers’ interactions with one another and with their customers as well as to observe and participate in conversations about a variety of topics. Perhaps more importantly, however, was that attending the Saturday market allowed me to observe and understand the cultural importance of fish, the fishers, and the fish market to the island community. On Saturdays, there is also a fruit and vegetable market that is located in the same parking lot as the fish market. Beginning at 5:30 in the morning, customers from all over the island come to buy their fresh fish and produce for the week. It was very important for me to observe the music, cooking, singing, dancing, and general social interactions that continued well into the afternoon on Saturdays. Likewise, it was very important to observe just how many people of all ages and ethnicities utilized the market to buy the fresh foods (see Figure 2). This direct observation proved very important to understanding how the importance of the fish market continues today as tradition from
the past, which is discussed in greater detail in Chapter 6. Data collected through these market observations are included throughout subsequent chapters when relevant.

After several months of frequent visits to the fish market, many of the relationships I had formed with the fishers developed into sincere friendships. Each time I arrived at the market, more and more individuals would go out of their way to greet me with a hug and a kiss on the cheek. Conversations flowed more freely, as they often do between friends who know about each others’ families, concerns, or recent important events. My husband and I were invited to several personal and familial social events, such as birthday parties, Easter celebrations, and special church gatherings. Attending these events allowed me to observe and understand other aspects of the fishers’ lives beyond those directly related to their jobs as fishers. Additionally, many fishers would tell me that they were happy that I was still in St. Croix, and that I continued to visit the market. They indicated that this was a nice change from most of the white scientists who

Figure 2. Saturday morning fish and produce market.
would visit the island for only a week at a time, and who, in the fishers’ opinions, never really took the time to understand the local context of the fisheries and how important fishing is to the fishers as well as the larger island community.

Also after several months, the fishers began to invite me to go on fishing trips with them, opportunities which I rarely turned down. They wanted me to see how they fished and the challenges they faced when out on the water. Also, those who used scuba to fish encouraged me to dive with them, so that I could see for myself how many fish, lobster, and conch there were in the spots they fished (Figure 3). Participating in these trips provided more opportunities for informal discussions regarding many topics related to my research, including the health of St. Croix’s marine environment, the main problems impacting the island’s fisheries and fisheries management, and whether or not

Figure 3. Photo taken while scuba diving with a spearfisherman.
fishers attend the public hearings held by NMFS and the Caribbean Fishery Management Council (CFMC) regarding the development of regulations.

Field notes were often written up after each of the participant observation and informal interview experiences described above. As mentioned earlier in the chapter, the contentiousness of fisheries management issues in St. Croix along with the great lack of trust members of the fishing community had for “outsider” scientists made it inappropriate for me to take notes during my informal visits to the market. These feelings were reinforced when, on several occasions, other researchers visited the market and took notes while I was there hanging out with the fishers. On these occassions, several fishers would mention to me how untrustworthy note-taking made the scientists seem. Instead of taking notes during my visits, I would write field notes as soon as I was able to after I left. While this meant that I was often unable to remember exact quotations from my visits, I was able to record the topics discussed, who was there, and any interesting ideas expressed by those with whom I was speaking. It is not uncommon for researchers to encounter these kinds of feelings and perceptions when conducting ethnographic research with fishers, and it is common practice to not take any written notes while conducting participant observation (Kitner 2006).

*Participant Observation at Meetings*

Participant observation also occurred during attendance of 30 public and semi-private meetings in St. Croix and St. Thomas. These meetings included general meetings of the CFMC, CFMC public comment and scoping meetings, St. Croix and St. Thomas Fisheries Advisory Committee (FAC) meetings, and scoping meetings held by DFW.
Observations were recorded during the meetings, including the names of those in attendance, field notes regarding how individuals interacted with one another, summaries of statements made by fishers and other attendees, and word-for-word quotations of phrases or statements I found to be particularly informative or interesting. Attending these meetings provided opportunities to meet and speak with potential interview participants, as well as to conduct informal interviews with others. Meeting attendance also allowed me to observe how fisheries management processes are conducted first-hand. This was especially important in developing ideas regarding how management processes as legislated differed from how they were actually conducted. Additionally, attending meetings and taking field notes functioned as a way to “ground-truth” statements made by participants during informal and semi-structured interviews. For example, on a few occasions during interviews, fishers told me that they attended the particular meeting we were discussing, though I did not remember them being there. Although I would not mention at that time that I did not remember them being there, I was able to go back to my fieldnotes to verify their absence. This functioned as a cross-check, and allowed me to examine participants’ motivations for not answering my questions truthfully.

*Semi-Structured Interviews*

Before entering the field, I planned to complete two separate phases of interviewing. First, I planned to conduct short, structured questionnaires (Bernard 2006; Schensul, et al. 1999) with individuals who self-identified as members of several different stakeholder groups. These included: commercial fishers, recreational and sport fishers, dive shop owners and employees, USVI government officials and employees,
NMFS officials and employees, local environmental non-governmental organization (ENGO) employees and representatives, and local (non-fisher) residents. I planned to conduct at least 40 questionnaires with individuals from each stakeholder group, hoping to recruit individuals who only identified with one group, so that both within-group and between-group comparisons could be made regarding questionnaire responses. I had planned the second phase of interviews to be a series of in-depth semi-structured interviews (Bernard 2006; Weller 1998) with a smaller number of individuals from each of the stakeholder groups. Because my research is focused primarily on commercial fishers’ perspectives and experiences, I planned to conduct 10-15 in-depth interviews with members of that group, while conducting slightly fewer (5) with members of the other stakeholder groups. My hope was that through these in-depth interviews, I would be able to expand upon some of the ideas and perspectives that emerged from the shorter questionnaires.

After living in St. Croix for several months and becoming familiar with the different stakeholder groups involved in fisheries management, however, it became clear that it would be advantageous for me to change my interviewing strategy slightly. First, I discovered that for some of the stakeholder groups, such as the dive shop owners and employees, there simply were not even 40 individuals on the island who belonged to the group. Second, I discovered additional stakeholder groups that played a key role in fisheries management in St. Croix, such as the Fisheries Advisory Committee (FAC).9 In order to fully examine fisheries management in St. Croix, I had to include this group, but

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9 The St. Croix Fisheries Advisory Committee (FAC) is an advisory group made up of commercial fishers, USVI Department of Planning and Natural Resources (DPNR) employees, dive shop industry representatives, and local environmental scientists who are charged with advising the DPNR Commissioner regarding territorial fisheries regulations. The role of this group is described in more detail in chapter 5.
it is another example of a group without 40 members. This also meant that I had to prioritize including certain groups in the study over others. For example, I felt that including the FAC in the study—due to the groups’ direct involvement in fisheries management—was more important and more relevant than including recreational fishers. In addition, while there are other stakeholder groups I could have included in the study if I wanted to document the entire economy of St. Croix’s fishery, such as tourists or local restaurants, the nature of my study meant that I focused specifically on the management process and the influence of those groups that participated. Third, I realized that only a small number of individuals on the island are actively involved in fisheries management and participate in the management process. Moreover, most of the individuals who are most involved with both the local and federal fisheries management processes are members of multiple stakeholder groups. Because of their high level of involvement, and because of the small total numbers of individuals that make up each stakeholder group, I wanted to ask them questions relating to all of the roles they play (such as dive shop owner and member of the FAC).

Therefore, I had to alter my strategy of interviewing individuals who self-identified with only one stakeholder group so that I could in fact include those individuals who were the most involved. Finally, and on a more logistical note, it simply became more practical to only conduct one formal, semi-structured interview with participants. Although throughout the course of the 20 months I lived in St. Croix I had multiple informal conversations and discussions with individuals, it was difficult to set up meeting times to sit down one-on-one with an individual and conduct a structured interview. Scheduling interviews with members from the different stakeholder groups presented
unique challenges. For example, most of the commercial fishers on the island have lived on the island for most of their lives, and so adhere to “island time,” meaning they rarely arrive “on time” to any event, meeting, or appointment. Often, if they are unable to attend the meeting, they do not feel it necessary to call the individual they were supposed to meet. Or, with those individuals who work for DPNR, their departments are severely understaffed, and so it was extremely difficult for them to find any free time during which they could meet me. Regardless of the reason that was given to me, when I finally did have the opportunity to sit down and conduct a semi-structured interview with an individual, I kept the interview going as long as I could, taking as much of their time as they gave me, since I knew I would probably not again have the chance to sit down with them and have their undivided attention.

For these reasons, I changed my interviewing strategy slightly, and conducted one semi-structured, in-depth interview with each participant. I developed and used a different interview protocol for each stakeholder group, which focused on topics pertinent to that particular stakeholder group. Additionally, the interview protocols included several questions that were asked to all participants, regardless of the stakeholder group(s) to which they belonged, in hopes that I could still carry out between-group analyses with the responses. For those individuals who belonged to several stakeholder groups, I followed an interview protocol that included the questions from all the groups to which they belonged.

Semi-structured interviews were used because this method allowed me to ask a variety of types of questions, including multiple choice, those with a Likert scale response, and open-ended questions. The interview protocol acted as a guide so I was
sure to ask all the questions I wanted to, but allowed me the freedom to probe on certain
topics and ask follow-up questions about anything I felt to be important (Bernard 2006;
Schensul, et al. 1999). This interview format is widely-used in fisheries anthropology
research (Blount 2007; Kitner 2006; McClanahan, et al. 2005; Olson 2006), and is an
effective method because it allows the researcher to obtain information on targeted topics
while reinforcing a less formal, relaxed atmosphere.

Interviews took place at a variety of locations, and I allowed each participant to
suggest the meeting place. Interviews with commercial fishers often took place at the La
Reine fish market, while interviews with DPNR employees often took place at their
offices. Regardless of the exact location, each interview was conducted in a location that
allowed us to have a quiet, private discussion and where participants’ responses were not
influenced by others’ presence. As described earlier in the chapter, although I had hoped
to digitally record the interviews for later transcription, the volatile and sensitive nature
of fisheries management issues on the island simply made this not possible. During the
interviews, I took detailed notes of participants’ responses, and wrote down word-for-
word any statements I felt to be important so that I would have quotations to include in
the dissertation to give the participants a “voice.”

The amount of time it took to conduct each interview varied greatly, depending on
how much information the participant was able or wanted to provide me with, and what
kind of time he/she had available for the interview. For example, a few interviews with
commercial fishers who did not pay attention to fisheries regulations and did not attend
regulatory meetings took only about 20 minutes to complete. On the other hand, several

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10 Throughout the dissertation, lengthy direct quotes that are included are the result of hand-written notes
where I recorded word-for-word statements with as much accuracy as possible; any mistakes are my own.
interviews with commercial fishers who were involved in the management process, or who simply supported my research and believed it to be important took up to three hours to complete. As stated earlier, because of the difficulty I experienced when trying to set up meeting times and locations in order to conduct the interviews, I always spent as much time with each participant as I could, and kept the conversation going until he/she had to end it.

Sampling

The main sampling strategy I used for choosing semi-structured interview participants was purposive sampling (Bernard 2006). I had specific information I wanted to gather from each stakeholder group, and so sought out participants who had the experience and knowledge to provide me with that information. Additionally, because there are only a small number of individuals involved with fisheries management in St. Croix, this sampling method was used appropriately. Moreover, for many years, this has been the sampling strategy used in research involving commercial fishers and/or the fisheries management process (Kitner 2006; Stoffle, et al. 2009; Valdes-Pizzini, et al. 2010). In most cases, I had already established relationships with interview participants through my previous visit to the island, my attendance of local and federal fisheries meetings, or through the daily experiences of working and living in St. Croix. A small number of participants were identified through newspaper articles or DPNR reports as being knowledgeable about fisheries management in St. Croix, and so were sought out and asked to participate. Additionally, although it was not the primary method utilized to find interview participants, I employed snowball or participant referral sampling as well (Bernard 2006). This is another sampling method commonly used in social science
research with fishers, as it is an effective way to learn about potential participants who might not be identified through other sampling strategies (Andreatta and Parlier 2010; Goncuoglu and Unal 2011; Tonioli and Agar 2009). At the end of the semi-structured interviews, and quite often at some point during informal interviews, I would ask participants who else they thought I should speak with, or who else might be interested in participating in my research. I used this more as a check on my other sampling strategy, ensuring that I was including all knowledgeable individuals in my interviews. This strategy confirmed the small number of individuals in St. Croix who are involved in fisheries management, because from the very first interview, all suggestions elicited from participants were individuals I had already identified as knowledgeable potential participants.

Description of Stakeholder Groups and Study Participants

I conducted a total of 92 semi-structured interviews between March 2009 and November 2010. As mentioned earlier in the chapter, my sampling and interview strategies changed once I arrived in St. Croix and realized the small number of individuals who made up the different stakeholder groups, and the even smaller number who were involved at all in fisheries management. Additionally, because of the large number of participants who were members of multiple stakeholder groups (n = 13), I could not divide the sample into mutually exclusive groups. Table 1 shows the number of participants interviewed from each of the stakeholder groups. The total number (n = 107) is greater than the total number of participants (n = 92) because several participants are included in multiple stakeholder groups.
Table 1. Total number of participants interviewed from each stakeholder group. Total = 107 is greater than the total number of participants (n = 92) because several participants belonged to more than one stakeholder group.

<table>
<thead>
<tr>
<th>Stakeholder Group</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Fishers</td>
<td>52</td>
</tr>
<tr>
<td>Caribbean Fishery Management Council</td>
<td>12</td>
</tr>
<tr>
<td>Department of Planning and Natural Resources</td>
<td>11</td>
</tr>
<tr>
<td>St. Croix Fisheries Advisory Committee</td>
<td>12</td>
</tr>
<tr>
<td>Dive Shop Owners/Employees</td>
<td>9</td>
</tr>
<tr>
<td>Environmental NGOs</td>
<td>7</td>
</tr>
<tr>
<td>Charterboat Operators</td>
<td>2</td>
</tr>
<tr>
<td>Marine-related Businesses</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>92</strong></td>
</tr>
</tbody>
</table>

Additionally, while there are other stakeholder groups I could have included in this study if I wanted to document the entire economy of St. Croix’s fishery, such as tourists or local restaurants, my study focused specifically on the management process and the influence of those groups that participated.

*Commercial Fishers*

Semi-structured interviews were conducted with 52 commercial fishers in St Croix. As described earlier, purposive and snowball sampling were used to recruit participants. Through previous research conducted in St. Croix and my attendance at 30 territorial and federal fisheries meetings, I am certain I interviewed all the commercial
fishers who were involved in fisheries management during my tenure on the island (n < 10). Additional fishers were recruited based on the frequency with which I saw them at the fish market, saw them on the water fishing or at the boat ramps and docks, delivering fish to restaurants or hotels, or selling fish on the side of the road. Due to the flexible and fluid nature of commercial fishing employment in St. Croix and occupational multiplicity (which are described further in Chapters 6 and 7), I did not want to restrict my sample to only those fishers who were involved in fishing-related activities for a certain number of hours per week or who did not participate in any other work for income. Instead, I focused on recruiting those fishers who I saw frequently as described above. Once I had interviewed or attempted to interview (and the fishers’ did not agree) all of the fishers who I saw in the aforementioned locations frequently, I began to interview those fishers I knew to fish less frequently, and who I believed, due to participant observation, to know very little about fishing practices and regulations.

Current estimates from DPNR’s Division of Environmental Enforcement (DEE) indicate there are approximately 160 registered commercial fishers (Farchette, personal communication). Of the 160 who are registered, there are approximately 70 that DPNR considers to be “full-time.”11 Based on these estimates, I am confident that my sample includes a significant proportion of those fishers who are largely involved in the island’s commercial fisheries. It is possible, however, that a few of the commercial fishers who utilize the Frederiksted Fisherman’s Pier are not included in my sample. Although it was the main landing site used by fishers on the western side of the island throughout the 1900s, its use has decreased in recent years as it has become a main hang-out for the

11 According to DPNR’s Division of Environmental Enforcement, commercial fishers are “full-time” if they do not have a full-time job outside of fishing.
island’s homeless and drug dealers. There are a few fishers who continue to utilize the pier, but they launch their boats very quickly and do not spend time working on their gear or selling fish at the pier upon their return. Several fishers and other island residents suggested I should not spend time alone at the pier and that I should not conduct participant observation at that location as I did at other locations throughout the island. On several occasions I visited the pier accompanied by other commercial fishers, but we were not successful in finding any commercial fishers during those visits. While I did interview several fishers who indicated they used the Frederiksted Fishermen’s Pier who were recruited through other sampling strategies, it is possible that a few were not interviewed.

Table 2 shows the basic demographic data for the 52 commercial fishers with whom I conducted semi-structured interviews. Fishers ranged in age from 17 – 82 years, and had an average age of 41 years. Their education level was lower than that of the other groups, with only 27.5 percent having graduated from high school and none of them having graduated from college. The fishers’ self-reported ethnicity revealed they were 57.7 percent Hispanic or Puerto Rican, 25 percent Crucian, and 17.3 percent black or West Indian. None of the fishers indicated they were white. All of the fishers interviewed were male, and they lived on St. Croix for an average of 35.2 years. These demographic data are important because analyses show that there are significant differences between the fishers and the other participants on several variables, including ethnicity and highest level of education completed. These points are discussed in more detail in Chapter 8.
Table 2. Demographic data for semi-structured interview participants. CF = commercial fishers; CFMC = Caribbean Fishery Management Council members or staff; DPNR = current or ex-employees of USVI Department of Planning and Natural Resources; FAC = members of St. Croix Fisheries Advisory Committee; DS = dive shop owners or employees; ENGO = staff or members of environmental non-government organizations; CB = charterboat captains or owners; BUS. = owners or employees of marine-related businesses.

| SUMMARY OF DEMOGRAPHIC DATA FOR INTERVIEW PARTICIPANTS |
|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|             | CF       | CFMC      | DPNR      | FAC       | DS        | ENGO      | CB        | BUS.      |
| n           | 52       | 12        | 11        | 12        | 9         | 7         | 2         | 2         |
| Age         |          |           |           |           |           |           |           |           |
| Age range   | 17 - 82  | 36 - 70   | 30 - 65   | 36 - 65   | 32 - 56   | 36 - 70   | 34 - 58   | 40 - 58   |
| Average age | 41       | 51        | 48        | 51        | 49        | 52        | 46        | 49        |
| Education   |          |           |           |           |           |           |           |           |
| % graduated from high school | 27.5 | 100.0 | 100.0 | 90.9 | 100.0 | 100.0 | 100.0 | 100.0 |
| % graduated from college | 0.0 | 75.0 | 70.0 | 54.6 | 77.8 | 100.0 | 100.0 | 100.0 |
| Ethnicity   |          |           |           |           |           |           |           |           |
| % white     | 0.0      | 41.7      | 50.0      | 50.0      | 100.0     | 100.0     | 100.0     | 100.0     |
| % Hispanic/Puerto Rican | 57.7 | 41.7 | 20.0 | 25.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| % black/West Indian | 17.3 | 16.7 | 30.0 | 25.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| % Crucian   | 25.0     | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       | 0.0       |
| Island tenure |          |           |           |           |           |           |           |           |
| Avg. # of years living in St. Croix | 35.2 | 16.9 | 23.3 | 32.1 | 18.3 | 18.2 | 15.0 | 23.0 |
| Gender      |          |           |           |           |           |           |           |           |
| % male      | 100.0    | 75.0      | 72.7      | 75.0      | 66.7      | 71.4      | 100.0     | 100.0     |

Caribbean Fishery Management Council (CFMC)

Semi-structured interviews were completed with 12 individuals who were affiliated with the CFMC. Of these 12 participants, two were CFMC staff members, four were CFMC voting members, and six were current or past members of CFMC advisory bodies. (The composition of the CFMC and advisory bodies are described in detail in
Chapter 5.) Two-thirds of these interviews (n = 8) were conducted in-person, in a similar manner to those conducted with commercial fishers. Four of the interviews were conducted via telephone because the participants lived and worked in various locations throughout the US Caribbean and the US mainland. The length of the interviews ranged between approximately one and three hours, and note-taking procedures were similar to those described earlier.

Unlike the other stakeholder groups described here, the semi-structured interviews conducted with the CFMC participants were not all carried out in a similar manner. For the other groups, the interview guide was designed so that several questions would be asked to all participants from each stakeholder group in a consistent way. This was done so that responses to particular questions could be analyzed for similarities and differences both between-groups as well as within-groups. In many instances, this approach did not make sense regarding the CFMC participants. First of all, several of the CFMC participants do not live in St. Croix, and so it did not make sense to ask questions about their daily experiences on the island. Secondly, several of the CFMC participants interviewed hold high-level positions within the CFMC and NMFS and, therefore, have a unique perspective regarding fisheries management in St. Croix. They were able to offer the type of information and perspectives most other study participants could not, so we spent long periods of time discussing these particular topics. Lastly, because many of the CFMC participants had very busy schedules associated with their high-level positions, I focused the limited amount of time I had for the interview (usually about one hour) on discussing what I felt would be the most valuable information I could gather from them for my study, and other topics were not discussed at all. For these reasons, the data from
the CFMC semi-structured interviews are analyzed and utilized differently than those from the other groups, which is described in greater detail later on in the chapter.

The 12 CFMC participants with whom I conducted semi-structured interviews ranged in age from 36 – 70 years, and had an average age of 51 years (see Table 2). All of the CFMC participants graduated from high school, and 75 percent graduated from college. Close to 42 percent (41.7%) self-identified as white, another 41.7 percent self-identified as Hispanic or Puerto Rican, and 16.7 percent self-identified as black or West Indian. Seventy-five percent of the CFMC participants were men, and they had lived in St. Croix for an average of 16.9 years.

Department of Planning and Natural Resources (DPNR)

Semi-structured interviews were completed with 11 past and current employees of the USVI DPNR. Those in upper-level DPNR positions were targeted for interviews, and others were selected based on their employment within the following divisions of DPNR: Division of Fish and Wildlife (DFW), Division of Environmental Enforcement (DEE), and the Division of Coastal Zone Management (CZM). These participants were selected based on their involvement with St. Croix’s fisheries through their jobs. Interviews were often held in participants’ work offices (although other locations were also used), and ranged in length from one to four hours. Similar note-taking procedures were used during the interviews as described earlier.

DPNR participants (n = 11) ranged in age from 30 – 65 years, and had an average age of 48 years (see Table 2). All of the DPNR participants graduated from high school, and 70 percent graduated from college. Half of the DPNR participants self-identified as white, another 30 percent self-identified as black or West Indian, and 20 percent self-
identified as Hispanic or Puerto Rican. Approximately 72.7 percent were men, and they had lived in St. Croix for an average of 23.3 years.

St. Croix Fisheries Advisory Committee (FAC)

Semi-structured interviews were completed with 12 individuals with past or current experience with the FAC. Of these 12 participants, ten were voting members on the FAC, and two had experience functioning as the FAC’s advisor from DFW. (An in-depth description of the FAC is included in Chapter 5.) Purposive sampling was used to identify potential participants from this group, as they were selected specifically because of their experiences with the FAC. Interviews were held at a variety of locations on the island, ranged in length from approximately one to three hours, and notes were taken during the interviews.

The 12 FAC participants with whom I conducted semi-structured interviews ranged in age from 36 – 65 years, and had an average age of 51 years (see Table 2). While 90.9 percent of the FAC participants graduated from high school, only 54.6 percent graduated from college. Half of the FAC participants self-identified as white, another 25 percent self-identified as Hispanic or Puerto Rican, and 25 percent self-identified as black or West Indian. Seventy-five percent of the FAC participants were men, and they had lived in St. Croix for an average of 32.1 years.

Dive Shops

Semi-structured interviews were conducted with nine individuals associated with the island’s dive shops. During my fieldwork, there were five dive shops operating in St. Croix. I interviewed the owners/operators of each shop (several of the shops are owned and managed jointly by couples), as well as a few dive instructors and dive boat captains.
who have been diving and working in St. Croix for at least five years. Because the dive industry in St. Croix is very transient, and many dive guides and instructors only work on the island for a short period of time, I feel I interviewed all those affiliated with the island’s dive shops who were aware of the island’s fisheries management issues to even a slight degree. Interviews were conducted at various locations throughout the island, ranged in length from one to two hours, and notes were taken during the interviews.

The 9 dive shop owners and employees with whom I conducted semi-structured interviews ranged in age from 32 – 56 years, and had an average age of 49 years (see Table 2). All of the dive shop participants graduated from high school, and 77.8 percent graduated from college. All of them self-identified as white. Close to 70 percent (66.7%) of the dive shop participants were men, and they had lived in St. Croix for an average of 18.3 years.

Environmental Non-Governmental Organizations (ENGOs)

Semi-structured interviews were conducted with seven individuals affiliated with ENGOs in St. Croix. There are two primary ENGOs with a presence in St. Croix: The Nature Conservancy (TNC) and the St. Croix Environmental Association (SEA). Both ENGOs have very small staffs, and the primary program staff members from each were interviewed. Additionally, other individuals affiliated with the ENGOs were also interviewed, such as members of the board of directors and volunteers. These interview data were supplemented with data collected through participant observation and informal interviews that took place at CFMC meetings with representatives of other ENGOs when they attended. Interviews with ENGO participants usually took place at the
organization’s office, they ranged in length between one and two hours, and notes were taken during the interviews.

The seven ENGO participants with whom I conducted semi-structured interviews ranged in age from 36 – 70 years, and had an average age of 52 years (see Table 2). All of the ENGO participants graduated from college (and high school), and 100 percent self-identified as white. Approximately 70 percent (71.4%) of the ENGO participants were men, and they had lived in St. Croix for an average of 18.2 years.

Charterboat Captains/Owners

Semi-structured interviews were completed with two charterboat captains. During the time of fieldwork, only one charter (sportfishing) boat received enough business to operate on a full-time basis and allowed the owner and captain to use it as his main source of income. As such, he was the only captain who indicated he was familiar with fisheries management in St. Croix. One other captain was interviewed, though his boat was rarely operating at the time. Several other captains were also contacted for interviews, but they refused because they felt they did not know what was currently going on or because they had not operated their charter operation in many years. These interviews were conducted at the participant’s home or boat, ranged in length between one to two hours, and notes were taken during the interview.

The two charterboat participants with whom I conducted semi-structured interviews ranged in age from 34 – 58 years, and had an average age of 46 years (see Table 2). Both of them graduated from high school and college, and they both self-identified as white. They both were male and they had lived in St. Croix for an average of 15 years.
Marine-Related Businesses

Semi-structured interviews were conducted with two individuals who were owners of marine-related businesses. These individuals were recruited for interviews because they own businesses related to the fishing industry. One participant owns a business highly dependent on the commercial fishers. The other participant has owned a marine-related business on the island for many years, and used to work as a commercial fisher. For these reasons, I felt these individuals could offer unique perspectives for my research. Other marine-related business owners were contacted (such as owners and managers of shops that sold marine supplies), but these individuals chose not to participate in semi-structured interviews. Some data were gathered from these individuals through informal interviews, however. These interviews were conducted at a restaurant and a dive shop, ranged in length from one to two hours, and notes were taken during the interview.

The two marine-related business participants with whom I conducted semi-structured interviews ranged in age from 50 – 58 years, and had an average age of 49 years (see Table 2). Both of them graduated from high school and college, and they both self-identified as white. They both were male and they had lived in St. Croix for an average of 23 years.

Data Analysis

Analysis of Semi-Structured Interview Data

During semi-structured interviews, I recorded participants’ responses as well as my thoughts and impressions (which were clearly marked as such) on the interview forms. These data were later entered into SPSS. Separate databases were created for each stakeholder group, as well as a database that included all participants and their
responses to the questions that I asked all groups. Textual responses were entered as such into databases, then later coded based on emergent patterns and themes (Bernard 2006; LeCompte and Schensul 1999a). Once all the data were cleaned and coded in SPSS, I used descriptive statistics (such as measures of central tendency), frequencies, crosstabs, and other non-parametric tests to analyze the data.

As described earlier in the chapter, my sampling strategy changed after arriving in St. Croix for two reasons: (1) several stakeholder groups I planned to interview had only small numbers of potential participants, and (2) many of the individuals who were most involved in the fisheries management process and, therefore, likely to be the most knowledgeable, were members of multiple stakeholder groups. For these reasons, and because the primary focus of my research was regarding the commercial fishers, I decided to divide my total sample into two groups—“fishers” and “non-fishers”—for analysis. Participants who held fishing licenses and were currently fishing commercially were placed in the “fishers” group (n = 52), and all other participants were placed in the “non-fishers” (n = 35) group. Because many of the CFMC interviews were different from those conducted with other groups, and many of the questions that had been asked of all other participants were not asked of CFMC participants (due to a lack of relevancy, as described earlier), those participants who only belonged to the CFMC group (n = 5) were not included in either group. Alternatively, CFMC interview data was used primarily to inform the discussion and analyses of the federal fisheries management system as presented in Chapters 5, 6, and 7.
Analysis of Field Notes from Participant Observation, Meeting Observations, and Informal Interviews

Field notes resulting from participant observation, meeting observations, and informal interviews were analyzed using a grounded theory approach (Glaser and Strauss 1967). I used an iterative process to inductively and deductively code these qualitative data (Bernard 2006; DeWalt and DeWalt 2002a), as I looked for emergent themes and patterns, but also analyzed data based on the presence or absence of ideas and opinions I expected to find as suggested by prior research and the theoretical literature.

One technique that was invaluable to my research was triangulation, which allowed me to cross-check the data collected and conclusions made based on one method with those from other methods (LeCompte and Schensul 1999a; Patton 2002). This was especially important due to the highly contentious nature of fisheries management in St. Croix, and the great distrust commercial fishers and other participants have for outsider scientists as they considered me to be. For example, I was able to verify if answers provided during semi-structured interviews seemed to be consistent with opinions expressed during informal interviews and behaviors observed during participant observation. In this way, the extensive and rich data I collected through less formal methods such as participant observation and informal interviews proved absolutely critical to the formation of my conclusions.

Presentation of Data and Results

The presentation of data and results is organized by topic, with most of the results and discussion presented in Chapters 8 and 9. Statistical analysis comparing the fisher and non-fisher groups guides much of the discussion of results in Chapter 8, and is complemented with the presentation of qualitative data from informal and semi-
structured interviews, participant observation, meeting observations, and field notes. Although analyzing the data by dividing participants into two groups did not allow for within-group statistical analysis of the smaller stakeholder groups (such as dive shop owners), qualitative analysis allowed me to look for these patterns, and they are presented when relevant.

The analyses of data presented in Chapter 9 was conducted in a similar manner, but focuses primarily on the commercial fisher data (n = 52). SPSS was used to conduct statistical analyses of the semi-structured interview data, but again due to small sample sizes of various groups of fishers (based on ethnicity, education level, method of fishing used, etc.), primarily non-parametric, descriptive techniques were used. Inductive and deductive coding techniques were used to analyze the qualitative data and the results are presented alongside those from quantitative analyses.

**Other Considerations**

One other point that must be discussed is the fact that in conducting this research, I was very much a woman in a fisherman’s world. According to recent estimates (Farchette, personal communication), there are no female licensed commercial fishers in St. Croix whom are currently fishing. There are a few women who help fishers (usually their husbands) sell their fish or contact potential customers, and I interacted with them whenever possible. For the most part, however, much of my research regarding commercial fishers occurred in situations where I was the only female present. I had anticipated this before beginning my fieldwork, and so I took certain precautions in how I presented myself the first time I visited the fish market, for example. From prior experiences in St. Croix, I was aware that many of the fishers often acted quite flirtatiously with younger women. In hopes of discouraging this behavior, I dressed
modestly (a practice that continued throughout my fieldwork) and had my husband accompany me during the first several visits. I wanted to make it clear to the fishers and others at the fish market that although I acted informally, I was not looking for romantic encounters. Additionally, I wanted the fishers’ wives and girlfriends (who often drove by or visited the market) to not be suspicious of my intentions and to not perceive me as a threat to their relationships and families. While I was not able to completely avoid flirtatious advances in this context during data collection, I feel I was largely successful in doing so and did not feel this was a major issue in conducting my research.

On the contrary, several commercial fishers suggested they were more willing to speak with me because I was a female. Although when asked why this was the case they usually provided a flirtatious response, I feel it could also be that they were more willing to share their experiences as fishers with me because as a woman, I was less likely to become a commercial fisher and use the “tricks of the trade” they shared with me.

Regardless of whether being a woman made fishers more or less willing to speak with me, the difference in gender certainly affected my experiences as a researcher, the data I collected, and the conclusions I reached. Again, this was something I anticipated and that is, unfortunately, unavoidable. I do not feel, however, that it compromised the research. Additionally, on a few occasions where I thought my gender could have colored fishers’ responses or behaviors, I asked my husband to informally discuss the same issue. There never seemed to be any major discrepancies, and I feel this operated as a useful (although very rough) check for this issue.

Chapter Summary

The research design and methodology described here were employed to conduct an ethnographic examination of the commercial fisheries management process in St.
Croix. Despite the highly contentious nature of the research topic, the small number of individuals involved in fisheries management, and the overlap of stakeholder group membership, long-term ethnographic methods and persistent and recurring participant observation allowed me to access what I perceive to be the realities of fisheries management in St. Croix. The next chapter describes the research setting in detail, linking the island’s colonial history and the more recent development of the tourism and manufacturing industries to the current condition of fisheries management.
CHAPTER 4
HISTORIES OF RACE, ETHNICITY, AND ECONOMIC DEVELOPMENT IN ST. CROIX

Chapter Overview

In this chapter, I introduce the research setting both historically and currently in order to contextualize (1) how ethnic relations in St. Croix today are connected to colonial history and (2) how the development of tourism and manufacturing beginning in the 1960s led to demographic changes which continue to impact ethnic relations today. In subsequent chapters, I will describe how these historical developments are connected to the current condition of fisheries management in St. Croix.

I begin with a brief note on Caribbean anthropology, highlighting prominent scholars’ contention regarding the lack of attention the field of anthropology has paid to the region. I then present the historical context of the island, focusing on the pre-history, colonial history, and post-colonial time periods prior to the large-scale development of the island in the 1960s. Particular aspects of each time period are highlighted, including: the struggle among European groups for control of the island that characterized the early colonial period; the development of St. Croix as the heart of Danish West Indies sugar production and the increased demand for African slave importation; the decline of the Caribbean sugar industry in the 1800s, and how that impacted St. Croix economically and socially; and the beginning of American rule in 1917 and the economic and social challenges the island faced beginning in the early 1900s. Additionally, I discuss why a
critical understanding of St. Croix’s colonial history is important to this dissertation, and how this history continues to affect social relationships today. The next section of this chapter describes the economic turn-around that occurred in the United States Virgin Islands (USVI) in the 1960s, brought on by the development of tourism and manufacturing on the island. The demographic changes that have occurred on the island since the 1960s are described, including the immigration of West Indians from other Caribbean islands and white Continentals from the United States (US) mainland. I explain how these migrations altered the conceptualizations of race in Crucian society and their impact on the development of a “Native Virgin Islander” identity. I then briefly describe the main ethnic groups present in Crucian society today, and the extent to which these groups relate to my research questions. I conclude the chapter with a description of why it is important to include information regarding colonial history and ethnic relations in discussions of contemporary fisheries management in St. Croix.

A Note on Caribbean Anthropology

Several scholars have noted the lack of attention the field of anthropology has paid to the Caribbean region (Mintz 1996; Yelvington 1996). Yelvington (1996) attributes this to “the ways anthropology became professionalized and the concomitant epistemological requirements to look for, and create if necessary, ‘pristine’ cultures and social structures” (86). In essence, the centuries of colonialism, migration, slavery and forced labor, miscegenation, and displacement of cultures from their places of origin meant that the Caribbean was too “hybrid” or “creole” for anthropological inquiry. As such, it was not “other” enough or “exotic” enough compared to other ethnographic sites (Trouillot 1992; Yelvington 1996). For Trouillot (1992), Caribbean cultural anthropology since the beginning of the 1900s reflects this incongruity between the
While some argue the Caribbean region has still not received the anthropological attention it deserves (Mintz 1996; Yelvington 1996), increasing interest in the globalization of social, cultural, and economic processes has shifted the focus of many anthropologists to the Caribbean. This is because Caribbean peoples, through the institutions of colonialism and slavery, have already been experiencing “the movement of ideas, commodities, capital and people through space and across borders” (Mintz 1996:304) for centuries. However, while Mintz proposes there are certain similarities in the histories of Caribbean islands, he does not believe the region is one cultural area. Instead, he views each island as unique, and, therefore, calls for a close examination of islands and cultural or ethnic groups individually. Critical to an understanding of contemporary Caribbean peoples, however, is an examination of their colonial history and experiences (Mintz 1996). It is with this in mind that I describe the history of St. Croix. This study contributes to a greater need for more grounded ethnographic research in the region, focused on St. Croix.

**Historical Context**

**Pre-History of St. Croix**

According to archaeologists, people have been living in the Caribbean islands for approximately 6,000 years. Over several millennia, indigenous groups moved into the Caribbean from a number of regions, including Central and South America, Europe, and Africa. The earliest evidence of human colonization of the Caribbean is found in Haiti, the Dominican Republic, and Cuba. These sites have been dated to around 3500 – 4000 BC (Wilson 1997b), and tools found at the sites suggest the earliest migrants may have
come from the west across the Yucatan Channel or by way of other routes from Central America. These were some of the first groups who had to adjust to a new way of life on an island, adapting their cultures and economies to island ecosystems. There has been no evidence found of very early groups cultivating food crops; instead they hunted, fished, and gathered the wild plants and animals available to them from the ocean and nearshore environments. A general lack of evidence of ceramic technology has led these groups to be called “pre-ceramic Indians” in the literature. It is suggested that the oldest artifacts found in the USVI, dating approximately 3,800 – 2,300 years ago, were from such early groups (Johnstone 2001; Wilson 1997a).

Sometime toward the end of the first millennium B.C., a large-scale migration into the Greater and Lesser Antilles by groups from South America took place. In a few hundred years, these groups spread throughout all the Antillean islands. Although numerous ethnic groups and cultures were likely represented by these peoples, it is believed that they all spoke a language of the Arawakan family (Highfield 2009c). For this reason, they have come to be called “Arawaks,” though they are also referred to as “Tainos.” Arawak culture was slightly more complex than that of their predecessors, and along with hunting, fishing, and foraging, they developed basic agriculture and limited trade with nearby islands. Archaeological evidence suggests that “Ay-Ay,” as St. Croix was called by the Arawaks, was connected both culturally and economically with the larger Arawak cultural centers to the west, especially present-day Puerto Rico and Hispaniola (Fewkes 1907; Loven 1979). In addition to similarities between various artifacts (such as axes, pottery, and religious figurines) found on both St. Croix and
Puerto Rico, similarities have also been found between the petroglyphs these groups left behind on the two islands.

By around 1300 A.D., the Arawaks had begun to be displaced throughout the Caribbean by a group from Venezuela, the Caribs. Although this displacement is often described as a large-scale blatant attack from the Caribs (Rouse 1993), other scholars propose the transition occurred much more gradually, primarily through bride capture and the eventual mixing with other groups such as the Arawaks and steady attrition (Highfield 1995). Like the Arawaks, the Caribs practiced small-scale agriculture, along with hunting and gathering of the island’s resources. Carib society was, however, quite different from that of the Arawaks. Warfare was a salient feature of Carib society, and a male’s status was acquired through his pursuits as a warrior. For this reason, the Caribs are often depicted as aggressive and fierce peoples (Dookhan 1994; Highfield 1995). The consistent raids on other communities provided the Caribs with an endless stream of material goods, slaves, and women, the latter of which led to a general mixing of Amerindian groups and a constant changing of Carib society (Highfield 1995; Wilson 1997a).

By the time Columbus arrived to the “West Indies” (the name he gave the Caribbean islands when he first arrived in 1492) on his second voyage in 1493, Ay-Ay had been taken over from the Arawaks by the Caribs (Highfield 1995). When Columbus’s fleet arrived at (present day) Salt River Bay, the landing party surprised the Caribs, and the first recorded skirmish between Europeans and the “Indians” from the “New World,” occurred (de Booy and Faris 1918). Though the exact details of the skirmish are unclear, there was one reported death on each side, and most of Columbus’s
men returned to the fleet with numerous Caribs and Arawaks as captives. From there, Columbus and his fleet continued their journey toward Española (present-day Hispaniola), and from there, the captured Arawaks and Caribs were sent to Spain. Although Columbus had claimed Ay-Ay for the Spanish and renamed it Santa Cruz, they made no real attempt to settle the island for several reasons: Santa Cruz did not have any gold, Caribs remained there and were willing to fight, and most of Spain’s colonial interests in the West Indies were at the time centered around Española (Dookhan 1994; Highfield 1995). For the most part, Caribs continued to live on the island with little interruption for about 10 years. However, as Spain’s Arawak slaves in Puerto Rico began to decrease drastically (due primarily to disease and harsh treatment), the Spanish began looking for slaves elsewhere, mainly to the Caribs. Several attempts were made to capture Caribs from Santa Cruz, which led them to band together with the remaining Arawaks to attack Spanish settlements throughout Puerto Rico. The relentless attacks between the Spanish in Puerto Rico and the Caribs in Santa Cruz ultimately led to the abandonment of the island by the Spanish around 1515 (Highfield 1995; Lewisohn 1970).

Colonial History

Active European interest in Santa Cruz began in the early 1630s. On several separate occasions until the 1650s, groups of English, French, and Dutch attempted to establish settlements on the island, often fighting amongst one another for control of the island (Highfield 2009b). All of these settlements were short-term, and the colonists

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12 Although well beyond the scope of this dissertation, Arnold Highfield provides a thorough discussion of the various recorded versions of the “encounter” story, as well as the historical validity of each in his book, “St. Croix 1493: An Encounter of Two Worlds” (1995).

13 It is important to note that the accounts of the colonial period in the Danish West Indies are primarily written by white Europeans, and as such reflect the perspectives of only one facet of colonial society and do not necessarily provide a complete picture of that society as experienced by slaves or women. Unfortunately more details on competing colonial histories in St. Croix do not exist. See Trouillot (1995) for a more complete discussion.
were ultimately attacked and driven out by the Spanish from Puerto Rico each time. As Spanish authority weakened in both Europe and the Caribbean in the mid-1600s, the French from St. Christophe (present-day St. Kitts) attacked the small Spanish contingency on Santa Cruz and took control of the island, renaming it Sainte Croix. Despite a few poor legal decisions (which resulted in Ste. Croix being owned by the Knights of Malta from 1653-1664), this was the first semi-successful colony on the island, based on plantation agriculture of cotton, sugar cane, tobacco, and indigo. With the growing plantation economy, however, came the need for laborers, and the French began to import slaves to the island from the Goree region in West Africa. Slaves soon greatly outnumbered the French and other Europeans on the island (Highfield 2009b). Throughout the late 1600s, however, the island was continually plagued by droughts, hurricanes, inadequate supply lines, and difficulties in getting products to market. Many of the colonists moved to other islands, and by 1697, Ste. Croix was essentially abandoned once again. Only a few settlers remained, primarily English and Irish settlers from the Eastern Caribbean and British Virgin Islands, and Dutch from Saba and St. Eustatius (Highfield 2009b; Willocks 1995).

The Danish West Indies

Denmark had colonized St. Thomas in 1672 and chartered the Danish West India and Guinea Company to begin plantation agriculture, primarily that of sugar cane (Figueredo and Argote-Freyre 2008). Once establishing this permanent presence in the West Indies, the Danish followed the practice used by the French and British and began participating in the slave trade, which ran between Europe, Western Africa, and the West Indies. Items such as cloth, clothing, spirits, and powder were brought to Africa from
Denmark in exchange for ivory, gold, and slaves. Slaves were then brought to the West Indies, and the African goods, along with Caribbean goods such as sugar and tobacco, were brought to Europe (Jensen 1998). When the Danish realized the limited agricultural potential of St. Thomas, the Company expanded their colonization to include St. John in 1718, but that island was also too mountainous for extensive sugar production. The lack of the need for slaves on St. Thomas and St. John along with numerous organizational problems within the Danish companies running the trade kept the Danish slave trade to a minimum through the first part of the 18th century. Denmark purchased Ste. Croix (dropping the “e” and calling it St. Croix) from the French in 1733, and the island’s larger, flatter, more arable land allowed for the rapid development of a significant sugar-producing, plantation economy. The three islands (St. Thomas, St. John, and St. Croix) became known as the Danish West Indies (DWI). Under Danish rule, St. Croix was parceled out into plantations, and invitations were extended to planters from other islands to occupy the parcels under easy and attractive terms. Many settlers did come from nearby English and Dutch colonies, joining the few settlers that had remained after the French abandonment in 1697 (Highfield 2009b; Willocks 1995).

During the first 20 years of Danish rule on St. Croix, the emphasis of labor was placed on clearing the forests that had overgrown the island since it was abandoned. Such a labor-intensive process created the need for massive amounts of laborers, which led the Danish West India and Guinea Company to become a major importer of African slaves into the West Indies. As a result, the number of slaves in St. Croix increased rapidly and by 1755 the number of slaves (8,897) far outnumbered the number of whites (1,323) (Highfield 2009b). Moreover, this increased trade allowed the Danish to develop
St. Thomas’s most significant physical resource—its deep and safe natural harbor—into one of the most important transshipment ports in the West Indies, specializing in the handling of all commodities, including slaves.

Though irregular, St. Croix’s sugar exports increased dramatically throughout the second half of the eighteenth century. Several periods of Danish open trade policies, as well as the high price of sugar in Europe during the continent’s intermittent wars, directly contributed to this increase. Although St. Croix exported only about 1.6 million pounds of sugar in 1755, that number skyrocketed in the following decades, with about 17.4 million pounds exported in 1765 and about 20.2 million pounds in 1775 (Dookhan 1994). Sugar production in St. Croix continued to rise throughout the beginning of the 1800s, reaching a maximum of about 46 million pounds exported in 1812, making it one of the top producers of sugar in the West Indies (Dookhan 1994).

In order to keep up with the drastic increases in sugar production, the slave population on St. Croix continued to grow, reaching around 23,000 slaves in 1775. Although accurate records are not available for all years, it is estimated that at its highest count, the DWI was home to approximately 36,000 slaves in 1803, with about 76 percent located in St. Croix (Willocks 1995). While the majority of these slaves came directly from West Africa, about one-third came from other West Indian islands, such as St. Kitts and Tortola (Highfield 2009b). The white population, on the other hand, decreased throughout this time period. St. Croix was the most densely populated of the DWI, and in 1758 whites comprised only 12.5 percent of its population; by 1775 it decreased to 8 percent, and was only 6.5 percent in 1803 (Dookhan 1994). White immigrants from other Caribbean islands, such as St. Kitts, Nevis, Tortola, and Virgin Gorda, also entered
the DWI during this time, hoping to make money on the sugar boom. Therefore, of the white population on the islands, very few (approximately 10 percent) were from Denmark. In St. Thomas, most of the settlers were Dutch, while in St. Croix, most were British and Irish (Dookhan 1994).

St. Croix continued to be among the foremost producers of sugar in the West Indies well into the early 1800s. However, several factors contributed to the decline of the industry and the overall decline in the economic vitality of the island in the latter part of that century, a trend that continued well into the 20th century. First, following the increasing aversion to slavery in Europe and the abolishment of the West Indian slave trade in the early 1800s, slaves in the DWI were emancipated in 1848. Although the DWI governor and the plantocracy tried to prevent a significant and potentially damaging loss of laborers after the slave emancipation through the implementation of the Labor Act of 1849,14 by 1853, the Crucian labor force had declined by 25 percent (Highfield 2009b). Many of these newly-freed slaves fled to Puerto Rico, Santo Domingo, or Cuba to work as free agricultural laborers, to Central America to work in the construction of the Panama Canal, or to the eastern coast of the United States, particularly New York (Highfield 2009b). Due to this great reduction in the number of laborers available in St. Croix, the Danish government turned to an aggressive immigration policy, encouraging workers from the nearby British (particularly Barbados), French (including St.

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14 The Labor Act of 1849 essentially functioned to keep newly-emancipated slaves working on the same plantation, doing the same work they had done before. The Act established a system of labor contracts that were valid from October 1 of one year until October 1 of the following year. If an individual did not want to renew his contract, he had to register his intention by August. Though technically he would be free to switch plantations in that case, the planters had agreed not to hire others’ workers. Additionally, in order to travel to another island to search for work, a passport was required, which cost much more than most workers were able to save (Highfield 2009b).
Barthelemy), and Dutch (including St. Eustatius) colonies to move to St. Croix throughout the 1860s and 1870s (de Albuquerque 1988).

Second, the widespread production of sugar from sugar beets throughout the world had a huge impact on the West Indian sugar industry. This caused the demand for sugar from sugar cane to drop, and the cost of sugar production to rise significantly. Combined with a long drought that struck St. Croix beginning in the early 1870s, many of the sugar plantations were forced to close. By 1880, only 15,664 acres were under cultivation in St. Croix, a drop of 22.4 percent from 1850 (Highfield 1983). In order to compensate for the reduced demand for sugar, the Crucian plantations that remained open attempted to diversify production, finding small success with items such as cotton and cattle. Even these efforts, however, proved fruitless due to the drought and a series of natural disasters (hurricanes and earthquakes) that afflicted the island towards the end of the 1800s (Dookhan 1994).

It is also suggested that the final blow to the sugar industry in St. Croix was the extensive damage caused by the 1878 Fireburn (Jensen 1998). This laborers’ riot mirrored uprising and rebellions that occurred throughout the Caribbean during this time period, and was sparked by thirty years of dissatisfaction with the labor legislation and conditions which had essentially left them in worse circumstances than when they were slaves. The riot lasted for nearly a month and caused great destruction throughout the island. In Christiansted, an estimated $670,500 was lost in the destruction of more than fifty plantations, and an estimated $1,341,000 was lost in Frederiksted (Marsh 1981). Many plantations were simply abandoned by their owners as a result.
For several decades after the Fireburn and on into the early 1900s, Denmark made attempts to improve the quality of life of those in the DWI and to revive the islands’ economy. Almost immediately after the Fireburn of 1878, legislation was passed that ended the enforcement of only year-long labor contracts (Marsh 1981). Additionally, the government began promoting a parceling-out system, in which laborers could either purchase or rent plots of land that had been parts of larger estates. This measure had a big impact in St. Croix, and the sugar industry there experienced a small surge in the mid-1890s (Dookhan 1994). Other measures focused on the reorganization and improvement of St. Thomas’s harbor at Charlotte Amalie, which had suffered significantly at the end of the 1800s from hurricanes, disease epidemics, and altered Caribbean trade patterns due to the advent of steam ships and telegraphic communication (de Albuquerque 1988).

Although Denmark’s efforts did lead to temporary improvements in the economic conditions of the working class in the DWI, they did little to counteract the overall economic decline and social instability at the turn of the century. Many residents throughout the islands emigrated to find employment elsewhere. Compounded by poor health and nutritional conditions, the population of the DWI decreased from about 40,000 in 1850 to 27,000 in 1911 (Dookhan 1994; Jensen 1998).

It is important to note that although the sub-disciplines of Caribbean anthropology and the anthropology of colonialism are often viewed as under-developed (Trouillot 1992; Yelvington 2001), the research that has been conducted offers a different perspective of the colonial experience and the legacy of slavery. Trouillot (1992) describes the anthropology of the Caribbean as reflecting three main themes: (1) the heterogeneity and complexity of Caribbean societies, (2) the “historicity” of the region
and the inescapable link of Caribbean societies to their histories, and (3) the boundaries and articulations regarding the anthropological methods enlisted to examine the region. Pels (1997) describes how anthropologists typically approach colonialism from three different angles: (1) “as the universal, evolutionary progress of modernization,” (2) “as a particular strategy or experiment in domination and exploitation,” and (3) “as the unfinished business of struggle and negotiation” (164). Combining these foci, what I feel is most important regarding contemporary fisheries management in St. Croix is the link between the heterogeneity of Crucian society during the colonial period and presently. By understanding how the balance of domination and resistance has been constantly renegotiated throughout the island’s history, one can more fully understand the dynamics that characterize the relationships between fisheries stakeholder groups today. This point is further explored later in this chapter.

Post-Colonial History

By the end of the 1800s, the DWI had become an economic and political drain on Denmark. The US had shown interest in purchasing the islands from Denmark beginning in 1865, primarily due to St. Thomas’s importance as a trade port and coaling station. After years of negotiations, the US purchased the DWI from Denmark in 1917 for $25 million, and the islands were renamed the United States Virgin Islands (USVI) (Willocks 1995). Although island residents were hopeful that the take-over by the US would mean improvement in economic and social conditions, the US was primarily interested in the islands for military purposes, and they were seen as little more than a naval base.

15 The islands could provide a military base for the US in the Caribbean, helping them to defend the Panama Canal after its construction, as well as prevent the ownership of the islands by nations that could increase their presence in the West Indies and impose opposition toward the US, such as Britain, France, Spain, or Germany. Additionally, as the US’ involvement in World War I became more apparent, the need...
The conception of the USVI as a military base led the US to place the islands under the care of the Department of the Navy, and the Secretary of the Navy was designated to oversee and supervise the development of the islands. Although this type of government was supposed to be temporary, once World War I ended in 1918 and the military importance of the islands consequently declined, the islands were essentially forgotten and the temporary government remained in place until 1931 (Leary 1988). Despite the measures Denmark introduced in the final years of its control of the islands, they lacked both a viable economy and an efficient social services system. The naval rule purposefully changed little about the way the local government was set up, and political power remained under the control of an exclusive and privileged class of wealthy people, primarily landowners (Dookhan 1994).

Despite great achievements made under the naval administration in regards to the improvement of basic social conditions, such as in the areas of public health, water supply, police, fire protection, and public education, the naval administration was much less successful when it came to improving the islands’ economy. Inefficient administration, frequent changes in naval governors, and the inability to act efficiently all dampened the administration’s effectiveness and the islands continued to decline. In St. Croix, this led to a continuous decrease in cultivation and production of the island’s only remaining asset- sugar. From 1916 to 1932 cultivated areas declined from 12,220 acres to 4,686 acres. Sugar production dropped from an average of 13.5 million pounds for the period 1910-1917 to only 3.57 million pounds by 1931 (Dookhan 1994). Rum production in St. Croix also declined as a result of the decline in sugar production, and for the US to acquire the islands and prevent Germany from doing so became increasingly important (Figueroedo and Argote-Freyre, 2008).
was compounded by the extension of the Prohibition Act to the USVI in 1921. Other events further impacted St. Croix through the 1920s into the early 1930s, including major hurricanes in 1924 and 1928, a drop in the price of sugar, and the major economic depression experienced worldwide. A final blow to St. Croix’s economy came in 1930 when the West India Sugar Plantation went bankrupt, and shut down its central factory at Bethlehem along with sugar cultivation on its 47 plantations, leaving more than 1,000 people unemployed (Tyson 1991). Once USVI residents realized that the transfer to the US did not mean all their economic problems would be solved, they continued to emigrate, this time to the US mainland, Puerto Rico, Cuba, and Panama. In 1917, the population was about 26,000, but by 1930, it had dropped 15.5 percent to about 22,000 individuals (Willocks 1995).\(^{16}\)

By 1931, economic and social conditions in the USVI had declined to the point that President Herbert Hoover called them the “effective poorhouse” of the US after he visited the islands in March of that year (de Albuquerque 1988). Under the newly-established civilian administration, a Homestead Program was initiated in hopes of stimulating economic rehabilitation. This program was particularly geared toward St. Croix, while in 1930, more than 90 percent of the countryside was owned by 25 corporate or family plantation owners. Moreover, of 4,927 non-white rural residents, only 56 were farm owners, most of which had descended from families of the plantocracy (Tyson 1991). The goal of the Homestead Program was “to transfer agricultural land historically monopolized by the plantocracy into the hands of Black and Hispanic small farmers,

\(^{16}\) It is worth noting here that it is likely the actual rate of emigration was even higher than 15.5 percent, as the population was augmented beginning in 1920 by immigrants from Puerto Rico as well as improved health standards (Dookhan 1994).
thereby creating a landowning middle class whose industry would help revive the moribund economy of St. Croix and make the entire territory more self-supporting” (Tyson 1991:5). To this end, the federal government purchased and distributed 2,680 acres of plantation land to 337 federal homesteaders on St. Croix. The territorial government parceled out several hundred additional acres to more than 80 homesteaders. Homesteaders primarily utilized their lands to grow sugar cane, and between 1934 and 1937 there were steady advances in both output and income. However, the late 1930s and early 1940s saw several severe droughts, causing a huge drop in cane production and sales. For many homesteaders, their profits did not allow them to make their land payments easily and a rise in government wages led many of them to abandon their homesteads. By the end of 1941 there were only 533 acres cultivated by only 202 homesteaders (Tyson 1991).

Additionally, the success of the Homestead Program was tempered greatly by the growing disinterest in the program by the federal government. Despite appeals by local officials, federal funding for the program was drastically reduced after 1934. Instead, the federal government poured millions of dollars into the Virgin Islands Company (VICO), which was chartered in 1934 to help revive the Crucian sugar industry (Tyson 1991). Even though VICO rarely made a profit, the federal government continued to appropriate funds to the company instead of to the Homestead Program, which local officials believed had a much better chance of succeeding. By 1942 the Homestead Program was assigned to the newly-formed Farm Security Administration, a federal body stemming from New Deal reforms, which worked to consolidate the homesteads and allow homesteaders to purchase their properties. These property transfers resulted in the
creation of large-scale landownership by middle class Crucians (Tyson 1991). Although the Homestead Program did precipitate several important changes in St. Croix between 1930 and 1950, such as an increase in the number of farm owners from 91 to 363 and the amount of farmland owned by non-whites doubling from about 5,400 acres (11 percent of all farmland) to 10,100 acres (25 percent of all farmland), it failed to produce the major economic and social transformations originally perceived. In 1950, five percent of the population controlled 80 percent of the land, and rural settlement patterns differed little from those of 1750. The sugar industry, which was controlled by VICO, dominated the economy, and persisted only with huge federal assistance (Tyson 1991).

Although the economy of the USVI was still in a perilous state throughout the 1940s and 1950s, immigrants once again moved to the islands, primarily from English-speaking Eastern Caribbean islands. Some came looking for work on St. Croix’s struggling sugar plantations after the industry was shut down on other islands, while others were recruited to relieve manpower shortages in other areas, including defense related industries, when a large proportion of the islands’ labor force volunteered or were drafted for military service in World War II (de Albuquerque 1988).

Throughout the first two decades that the USVI were under American rule, Virgin Islanders became increasingly dissatisfied with the political system that had been put in place. Although small changes were made, such as the granting of US citizenship to most Virgin Islanders (1927) and the removal of naval rule and the establishment of civilian rule (1931), the political system in the USVI still largely reflected the Danish Colonial Law of 1906. One of the biggest problems was the property and income requirements for voting. In the mid-1930s, fewer than 1500 individuals were able to vote
in a population of over 20,000 (Krigger 1992). Through major efforts both in the USVI as well as on the mainland, the Organic Act of 1936 was passed by the US Congress. Under the Organic Act the USVI governor was still appointed by the President of the US, but required members of the municipal councils\textsuperscript{17} to be elected. Additionally, it removed the property and income requirements for voting, and extended the franchise to all US citizens who were able to read and write English. This greatly increased the number of individuals who were able to vote. Additionally, as a result of the increase in the voting population and the fact that council members were now to be elected, political parties began to emerge in the USVI. This had a profound impact especially in St. Croix, where the new form of government meant that the council and political power was no longer solely in the hands of the wealthier merchant and planter classes (Krigger 1992).

Further political reforms occurred with the passing of the Revised Organic Act of 1954. This Act formally designated the USVI as an unincorporated territory of the US, although such a relationship had generally been established. Additionally, the literacy and language requirements for voters were removed, which opened the franchise up to many native Puerto Ricans, French, and other islanders. This was especially important in St. Croix, where large numbers of Puerto Ricans living in Vieques relocated in the 1940s when the US Navy expropriated much of the island (Highfield 2009a; O'Neill 1972).

Further, the legislative power was conferred in a unicameral body, abandoning the two council structure that had been in place since Danish rule.

\textsuperscript{17} Two municipal councils had been established under Danish rule: one for St. Thomas/St. John district, and one for St. Croix district.
An Era of Development: 1960s to the Present

The long-awaited economic turn-around for the USVI finally occurred in the 1960s, brought on by the development of the tourism and manufacturing industries. These two industries continue to have a profound and lasting impact on St. Croix’s economy and society today.

Tourism

The development of a thriving tourism industry is one factor that contributed to the economic rebound of the USVI. The US embargo of Cuba beginning in 1959 redirected US tourists and capital to the USVI, and the USVI were promoted as “America’s Paradise” (de Albuquerque 1990). As a result, the number of tourists visiting the islands increased greatly, growing from 16,000 in 1949 to 1,122,300 in 1969 (Dookhan 1994). The increase in tourism led to the opening of many tourist-centered businesses on all three islands, especially St. Thomas, and St. John was developed into a tourist resort/national park through private initiative and the National Park Service. St. Thomas quickly became an almost obligatory stop for cruise ships, and the number of cruise ship arrivals increased by 600 percent from 1960 (124,400 arrivals) to 1969 (743,970 arrivals). Furthermore, with the arrival of the first PanAm jet to the USVI in 1962, the number of air arrivals increased by 500 percent during that same time period (de Albuquerque 1988).

Since the early 1970s, the tourism industry has continued to be the economic mainstay of the USVI economy. Several events have led to short-term decreases in the
number of visitors to the islands, such as the Fountain Valley murders\textsuperscript{18} and associated racially-motivated violence (1972), Hurricanes Hugo (1989) and Marilyn (1995), and the September 11, 2001 terrorist attacks. However, for the most part, within a year of these events visitors again have returned to the islands, usually sparking new waves of tourism-related construction such as new hotels, private homes, and condominium complexes (Highfield 2009b).

Today, tourism continues to be a critical part of the USVI economy. Expenditures from tourism were about 1.51 billion dollars in 2007, accounting for approximately 33 percent of the Gross Territorial Product (GTP). From 2005 to 2009, an average of approximately 2.49 million visitors came to the islands each year. The majority (about 70 percent) of these visitors are cruise ship passengers, primarily visiting St. Thomas’s harbor of Charlotte Amalie, which continues to be one of the most visited ports for cruise ships in the Caribbean. As a result, St. Croix has fewer tourists visiting each year than the St. Thomas/St. John district, and in 2009, only about 10.5 percent of the tourists visiting the USVI visited St. Croix (Bureau of Economic Research 2010).

Tourists that visit St. Croix are often looking for a more laid-back and less mainstream vacation experience. At present, St. Croix does not have any hotels or resorts that are part of international hotel chains such as Hilton or Marriott, and instead visitors can choose from an array of small-scale beach-front hotels or locally-owned resorts. The territorial government believes that St. Croix’s potential as a tourist destination has not yet been reached, and so they are working with the private sector to market the island as such. Over the past ten years, however, there have been several proposals for building

\textsuperscript{18} The Fountain Valley murders occurred in 1972 when a group of five blacks killed seven white and one black person at a resort in St. Croix. The assailants claimed they were acting to eliminate “the alien white class” (Boyer 1983:313).
large-scale resorts and casinos, but most of them are unsuccessful due to a lack of support from Crucian residents. Most do not want to see St. Croix become “another St. Thomas,” full of expensive chain resorts and restaurants, up-scale shops, and thousands of cruise ship passengers a day.

**Manufacturing**

Although St. Thomas has a larger tourism industry, St. Croix has been the center of the territory’s manufacturing industry since the 1960s. Beginning in that decade, the territory encouraged the diversification of the USVI economy by issuing tax exemptions and industrial subsidies in order to stimulate industrial development. These incentives promoted the development of heavy industries in St. Croix, such as Harvey Aluminum Corporation and Hess Oil Virgin Islands Corporation (HOVIC) (Willocks 1995). In 1962, Harvey Aluminum Corporation developed 1,200 acres of property on the south shore of the island to process bauxite from Australia and West Africa into alumina. The 25 million dollar facility included a private harbor which Harvey built by filling in Krause Lagoon. HOVIC constructed its 45,000 barrels-per-day facility on 2,000 acres on the south shore of the island and began operations in 1966. By 1974, the refinery had expanded to support production of 650,000 barrels-per-day, making it the largest refinery in the world at the time (Hovensa n.d.). HOVIC also built its own port, dredging a 35-foot deep channel for the tankers to approach the refinery. In addition to these two companies, several others took advantage of the tax incentives being offered by the USVI government, primarily firms manufacturing such items as textiles, pharmaceuticals, toys, jewelry, and watch movements (Oxtoby 1970). Rum production also increased during this time, mainly as a result of the excise tax “cover-over” program, in which the excise
taxes are charged directly to the rum producer and are considered local territorial tax revenues.

Today, St. Croix’s economy continues to be largely based on manufacturing, particularly the export of petroleum and rum. In 1998, HOVIC was developed into HOVENSA, a joint venture between subsidiaries of Hess Corporation and Petroleos de Venezuela, S.A. (PDVSA), Venezuela’s national oil company. It is one of the largest oil refineries in the Western Hemisphere, and the largest private employer in the USVI. In 2009, it exported a total of 9.35 billion dollars worth of petroleum products to the US, which accounted for approximately 86 percent of the territory’s exports (Bureau of Economic Research 2010). Rum production also continues to be an important industry in St. Croix. Despite numerous changes in ownership in the past several years, Cruzan Virgin Islands Rum Industries Limited (VIRIL) has increased both production and exports since the early 2000s. In 2009, VIRIL exported a record 9.65 million proof gallons, an increase of 21 percent over 2008. The increased exports generated 106.8 million dollars in excise taxes for the USVI government (Bureau of Economic Research 2009). In addition to signing an agreement to keep Cruzan VIRIL on St. Croix for an additional 30 years, expand the facility, and increase production by an estimated 50 percent, the USVI government has also entered into an agreement with Diageo, PLC for the construction and production of a high-capacity distillery on St. Croix. Construction of the facility has already begun, and it will have the capacity to distill up to 20 million proof gallons of rum a year, expected to generate about 100 million dollars a year in excise taxes for the territory. Production is expected to begin in 2011, and by 2012 it will
supply all the rum used to make Captain Morgan branded products for the US (Bureau of Economic Research 2009).

Harvey Alumina changed hands several times over the years and was finally shut down in 2001 due to a lack of demand. In 2002, the site was acquired by St. Croix Renaissance Group LLLP to develop the St. Croix Renaissance Park. The site was developed to provide competitive and high quality on-site infrastructure for electricity, steam, water, and telecommunications, as well as direct access to a large deep-water port which is centrally located relative to international shipping lanes (St. Croix Renaissance Group LLLP 2009). The Renaissance Park is an example of the government’s continuing efforts to diversify the USVI economy, and currently has main two tenants: GeoNet Ethanol LLC, which operates a state-of-the-art ethanol dehydration facility, and Diageo (mentioned previously).

**Demographic Changes Since the 1960s**

The growing tourism and heavy manufacturing industries, along with allied construction, produced an economic boom in the USVI. According to McElroy (1978):

During the 1960s, the Gross Territorial Product adjusted for inflation grew 10 percent per capita; personal income per capita increased fourfold; tax revenues rose over seven times; the employed labor force more than tripled; the stock of housing more than doubled; and electric and water consumption rose an average of 20 percent per year (67).

Overall, the population grew from 32,000 in 1960 to 63,200 in 1970 (Dookhan 1994). A great deal of this population growth was the result of the immigration of unprecedented numbers of West Indians into the territory. In order to fulfill the labor demands stemming from the new industries between 1960 and 1970, immigration laws were revised to allow immigrants, primarily from Eastern Caribbean islands, to enter the territory as temporary workers. In St. Croix, many of the migrants entered to work on the
construction of the HOVIC and Harvey Alumina industrial complexes. As a result, an estimated 23.9 percent (21,761) of the population of St. Croix by the mid-1960s were aliens (Roopnarine 2008a). Additionally, the economic upswing in the 1960s also led to an increase in the number of migrants moving to the USVI from the mainland US (often called “Continents” by Virgin Islanders). These individuals were attracted to the islands by investment and employment opportunities stemming from the growing tourism industry, or were recruited by major industries such as HOVIC and Harvey to fill supervisory and upper-level positions (de Albuquerque 1988). The 1970 Census reported an increase of the population of St. Croix from about 15,000 in 1960 to about 36,000 in 1970, an increase of approximately 140 percent (de Albuquerque and McElroy 1982).

The government’s rationale for their support of HOVIC and Harvey was that such development would prevent St. Croix from being completely dependent on tourism, and that their establishment and expansion would help alleviate unemployment on the island because the companies’ agreements with the USVI government required that 75 percent of their employees be “legal residents of the Virgin Islands” (O'Neill 1972:117). Both Harvey and HOVIC used the specific language as a loophole and began bringing in employees from the continental US and other places to work in the facilities. In 1970, only 20 of the 471 Harvey employees at the time were native Virgin Islanders, and 65 percent of those remaining were imported aliens (O'Neill 1972). Although these aliens were likely to be legal temporary workers, utilizing imported aliens rather than native Virgin Islanders certainly did not help alleviate local unemployment.

As a result of the unprecedented numbers of West Indians and Continentals who entered the USVI in the 1960s and early 1970s, native Virgin Islanders essentially
became a minority in their own territory. Feelings of resentment grew towards the new West Indian immigrants, as native Virgin Islanders began to fear their political power would be lost in the future as an increasing number of temporary aliens achieved permanent resident status and naturalization. These feelings of resentment worked to keep West Indian immigrants in the lowest social class, a position they had been placed in since arriving in the USVI as temporary workers. They were considered aliens and were not afforded all the rights and privileges of other residents. Several reports from the late 1960s and early 1970s indicate that West Indian immigrants were forced to the lowest social levels, holding the lowest-paid jobs, not having access to basic social services, and comprised 90 percent of the population crowded into urban housing projects with substandard conditions, such as insufficient water access and plumbing (de Albuquerque and McElroy 1982). As a result of these reports, federal authorities introduced a series of legal reforms in the mid-1970s geared to restrict further immigration and to help integrate the alien population into the social and economic structure of the USVI.

The white Continentals who entered the USVI during the economic boom in the 1960s, though numbering much fewer than the West Indian immigrants, were perceived by Virgin Island natives as an even greater threat to native political power. Although the development of tourism and industry in the 1960s provided a much needed economic turn-around in the USVI, most of the benefits were being reaped by white Continentals, and the increased prosperity was unevenly distributed. For example, although by 1970 the USVI had the third highest per capita income in the Western Hemisphere, it was very unevenly distributed: for whites it was $5,269, while for blacks it was $1,714 (Krigger
Additionally, by 1970, the unemployment rate for whites was half of that of non-whites, and white families’ median income was double that of non-white families (de Albuquerque and McElroy 1985).

De Albuquerque and McElroy (1985) suggest that the large-scale in-migration of whites from the US mainland in the 1960s and 1970s led to a significant change in the importance of race—primarily black or white—in ascribing status in USVI society. Historically in the USVI, as in other West Indian islands during and after the colonial period, the large number of mixed individuals (individuals of both black and white origin) exhibiting a very wide range of skin colors allowed for the development of an extensive status system based on the subtleties of color and modified by other components of status (e.g., education, occupation). Although there are many records describing the blatant forms of racism all non-white groups faced after the US naval regime took control of the islands, de Albuquerque and McElroy (1985) suggest that the issue became increasingly polarized during the economic upswing of the 1960s when the numbers of white Continentals moving to the islands increased, and the types of jobs the new arrivals were occupying changed.

For example, prior to the 1960s, many of the whites that moved to the islands were retirees, or upper-class individuals who formed a high-level entrepreneurial and professional class in society. After the 1960s, many of the whites were from lower socioeconomic levels, and competed with native blacks for employment in areas such as middle-level government service, retail, and construction. Additionally, whites increasingly filled many of the professional, managerial, supervisory, and skilled positions that the economic boom generated, for which many of the uneducated blacks
were not qualified. De Albuquerque and McElroy (1985) suggest that by the early 1970s race had become a unifying factor for nonwhites in the USVI, especially for those under age 35, who were increasingly influenced by the “black power,” Rastafari, and Muslim movements gaining popularity in the US mainland and around the world. Though many of the protests against racial discrimination occurred quite peacefully in the USVI, scholars suggest there was a

small but growing class of permanently unemployed and disaffected black youth [who] subjectively perceive their economy as being controlled by white ‘outsiders.’ They believe that their culture has become ‘alien’ (non-African). It is this underclass that has a monopoly on violence (verbal and physical) and they appear to disproportionately direct their violence towards whites (de Albuquerque and McElroy 1985:138).

In the early to mid-1970s, displays of this violence included the murder of eight people, seven of whom were white and four of whom were tourists, at the Fountain Valley Club House in 1972, and several other racially-motivated murders that followed.

Population growth slowed down in the 1970s, which de Albuquerque and McElroy (1982) contribute largely to stricter immigration enforcement, the out-migration of whites following the Fountain Valley murders, and a reflection of the recession plaguing the country as a whole throughout the mid-1970s. Population growth during the 1970-1980 decade averaged only 2.5 percent per year, with the majority (60 percent) of this growth resulting from natural increase (de Albuquerque 1988). Although the stint of racially-motivated violence was relatively short, the economic boom of the 1960s and the resulting demographic changes made a lasting impact on USVI society. In a series of papers written through the 1980s and 1990s, de Albuquerque and McElroy (1982, 1985, 1999) describe the USVI as a heterogeneous society with a high degree of social and cultural pluralism. Using census data from the 1980 and 1990 US Censuses of
Population, they demonstrate that the various racial, ethnic, and nationality groups of the USVI have differing family, household, occupational, labor force, income, and educational characteristics, are often residentially segregated, and engage in very different and exclusive recreational and associational activities. They conclude that, “These groups, for all intents and purposes, constitute separate communities and the relationship between them is most often coloured by mutual distrust, misunderstanding, and hostility” (de Albuquerque and McElroy 1999:3). To a large extent, this separateness still characterizes USVI society today.

Ethnic Groups Today

In this section I will describe the main ethnic groups of St. Croix today, as well as what this ethnic make-up means for native Virgin Islander identity. An understanding of the ethnic groups and their relationships with each other is important to understanding the interactions between fisheries management stakeholder groups, which is discussed in the final section of this chapter.

White Continentals

The white component of St. Croix’s population has steadily declined since 1970 (18.2 percent in 1970, 14.8 percent in 1980, 13.5 percent in 1990, and 13.1 percent in 2000) (U.S. Census Bureau 2010), and white Continentals continue to be viewed as outsiders, often regardless of how long they have lived in the USVI. These in-migrants have primarily become involved in the tourism and service industries, and have done a good job of creating a “Key West” type of atmosphere with which most tourists come into contact.

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19 The terms used for the various ethnic groups in this section are those typically used by researchers (both “local” and “outsider”) when describing the US Virgin Islands, such as Krigger (1983), Roopnarine (2008a), and Valdes-Pizzini (2010).
The grafting of this somewhat alien tourist-oriented service culture onto the USVI fabric has produced considerable social distance between white Continentals and black and brown islanders. Whites live in the wealthier residential neighborhoods or on boats. They socialize with each other, patronize white establishments, hire whites in preference to others, and send their children to mostly white private schools (de Albuquerque and McElroy 1999:16).

Although the 2010 census indicates that whites make up a slightly smaller percentage of the population on St. Croix (11.6 percent) than in 2000 (U.S. Census Bureau 2010), and the tourism industry is not the island’s sole economic charge, this ethnic separation persists.

**West Indians**

Since the large-scale migration of West Indians into the USVI in the late 1960s, the percentage of the USVI population born in other Caribbean islands has remained steady at about 30 percent (de Albuquerque and McElroy 1999). The same trend is seen in the St. Croix population, with 28 percent of the population born on other Caribbean islands as determined by the 2000 census (U.S. Census Bureau 2010). As mentioned previously, West Indians typically were considered to be the lowest social class in USVI society in the late 1960s and early 1970s. Scholars describe how the West Indian migrants worked hard and took advantage of the opportunities available from the US-controlled island system, such as subsidized college education and other assistance programs (de Albuquerque and McElroy 1985; Roopnarine 2008a). Over time, many migrants and especially their children and grandchildren were qualified for public and private positions, and have slowly moved up the social and economic ladder. Perceived by native Virgin Islanders as stealing their jobs, West Indians continue to be seen as a somewhat distinct ethnic group, despite a certain amount of “mixing” that has occurred.
between the two groups through both marriage and the bearing of children. This has led to many native West Indians who live in the USVI to retain strong familial and community ties to their home country. Additionally, many individuals tend to live with or near other individuals from their home island, and many community groups exist based on nativity (Roopnarine 2008a).

*Puerto Ricans*

Another group of island residents that has managed to maintain a strong group identity are Puerto Rican Virgin Islanders. As mentioned previously, there has been a great deal of inter-migration between Puerto Rico and St. Croix for hundreds of years, a substantial portion of which occurred during the 1930s and 1940s, when the sugar industry of Vieques shut down and the US Navy expropriated the island. Up until the 1980s, the Puerto Rican population on the islands, especially St. Croix, gradually increased, accounting for 19.2 percent of the population on St. Croix according to the 1980 census (U.S. Census Bureau 2010). Although they, like West Indians, were discriminated against when they first arrived and a mutual hostility existed between them and black Crucians, they were able to overcome this a bit more quickly because, unlike the West Indian temporary worker aliens, they were considered US citizens (de Albuquerque and McElroy 1985). This allowed them to not only participate in the political system, but in light of their increasing percentage of the population, they have consistently been able to elect representatives both to the Legislature and the Governorship who have advocated for their cause. At the same time, Puerto Ricans have maintained close familial and community ties with their home islands, aided by their close proximity. Additionally, like many West Indians, Puerto Ricans on St. Croix—
“Puerto Crucians” as they often refer to themselves—tend to live in the same neighborhoods and socialize with one another, continuing their cultural traditions through religion, language, and cuisine (de Albuquerque and McElroy 1999). Although according to the 2000 census, Puerto Ricans account for only 7.9 percent of the total USVI population, they continue to have a stronger presence in St. Croix, where they account for 13.8 percent (U.S. Census Bureau 2010).

Native Virgin Islanders

One of the most salient and politicized issues regarding USVI demographics has to do with the concept of who is and should be considered a native Virgin Islander. Paralleling similar debates elsewhere this became increasingly important in the late 1960s and 1970s due to the large-scale in-migration of West Indian immigrants and white Continentals. Before the 1960s, the mostly black native component of the population remained fairly stable comprising about 75 to 80 percent of the total population. This percentage decreased in the 1940s and 1950s due to the influx of Puerto Ricans, but it dropped greatly by the 1970s. By 1980, the total population of the USVI was 96,569 individuals, with more than 50 percent of that total not born in the USVI (de Albuquerque 1988; de Albuquerque and McElroy 1999). The same trend was seen in St. Croix, where only 44.3 percent of the total population (49,725) in 1980 was born in the USVI. There were, and continue to be, a small percentage of native whites, mainly descendents of the Danish and other European white plantocracy from the colonial period. Even these individuals, however, tend to stay separated from the white Continentals, coming together with other native Virgin Islanders in hopes to retain their “control” over USVI government and society.
Although the aforementioned racially-charged crime died down by the end of the 1980s, the resentment of native Virgin Islanders toward outsiders from anywhere (but especially whites from the Continental US) remained. Little has changed regarding the percentage of native USVI and Crucian populations. The 2000 US Census showed that slightly less than 50 percent of the population, both of the USVI as a whole and of St. Croix island specifically, are native Virgin Islanders (U.S. Census Bureau 2010).

Although the migration of Puerto Ricans and West Indians has slowed down over the past few decades, there has been a consistent out-migration of native Virgin Islanders, primarily to the mainland US, due to the lack of job opportunities, high costs of living, cyclical instability, and inadequate and inefficient social services in the Virgin Islands (Roopnarine 2008b). To offset the loss of native Virgin Islanders there has been an influx of Continentals, Arabs, Asians, and Santo Dominicans.

“Native Virgin Islander” and Politics

The resentment toward outsiders, especially white Continentals, still exists today, and is also a reflection of the growing dissatisfaction among Virgin Islanders with the status of the islands as a dependent territory of the US. Leary (1988) describes how Virgin Islanders have struggled for self rule, and to achieve the same rights as US citizens as well as the privileges that go along with that status. The milestones of that struggle include: US citizenship (1927), civilian rule (1931), self-government and universal suffrage (Organic Act of 1936), an elected governor (1968), a delegate to Congress (1972), and the authority to write a constitution (1976) (Leary 1988). The movement for complete independence from the US has never been particularly strong, and some attribute this to a lack of a recognizable Virgin Islander identity. De Albequerque and McElroy (1999) discuss this issue:
Although not a discrete ethnic group, native Virgin Islanders often act as if they constitute a separate group. Caught between their lucrative American connection and their Eastern Caribbean heritage, Virgin Islanders frequently exhibit a kind of cultural marginality. Unwilling to fully embrace white or black America, or their Leeward Island cousins, from whom they cannot be meaningfully separated socio-culturally, they have shown an inordinate preoccupation with trying to uncover and authenticate a separate Virgin Islands culture (10).

The high levels of migration both into and out of the islands throughout USVI history has made it difficult to reach consensus regarding what qualifies an individual as being a “native” whether among scholars or residents. Additionally, scholars contend that the transfer of the islands to the US shifted relations between ethnic groups from a more flexible system while under Danish rule (where there were differing degrees of blackness, and whiteness did not necessarily determine higher social status), to a more rigid “black and white” system as found in the mainland US (de Albuquerque and McElroy 1999). This has blurred divisions and complicated relationships between native Virgin Islanders and other residents.

For example, in 1985, de Albuquerque and McElroy noted that nativity, color, family name, and length of residence played an important role in the sociological definition of a Virgin Islander. In 1999, they suggest that the most widely shared definition is becoming more flexible, as they found USVI-born children of Eastern Caribbean immigrants were increasingly being considered natives, even though the USVI-born children of white and black mainlanders were not (de Albuquerque and McElroy 1999). An attempt to define “Virgin Islander” was part of a legislative bill in 1996, but it was shot down because it linked “Virgin Islander” to having one ancestor born in the Virgin Islands prior to 1917, with the bulk of the protests coming from naturalized citizens born elsewhere in the Caribbean. The topic is still being debated.
The issues involved with determining who is considered a native Virgin Islander have made it difficult to reach consensus regarding what is best for the political future of the USVI—remaining an unincorporated US territory, US integration through statehood, or independence. Additionally, American citizenship was fought hard for and many still value it, which could be a barrier to independent political identity (Leary 1988).

**Linking St. Croix’s Colonial Past and Ethnicity with Fisheries Management**

It is important to include St. Croix’s history and ethnic relationships in discussions of fisheries management because the historical relationships and power struggles between groups influence current relationships, which in turn, influences how these groups interact in the fisheries management context. For example, in St. Croix only 7.7 percent of commercial fishers identified themselves as white, with the majority self-identifying as black or West Indian (41.6 percent) or Hispanic (48.4 percent) (Kojis 2004). Because many ethnic groups retain close cultural and familial ties with their native islands (primarily Puerto Rico and other Caribbean islands), I argue, based on data presented in subsequent chapters, that this heterogeneity has the potential to prevent the commercial fishers from developing a cohesive, organized Crucian commercial fishermen identity.

However, despite the ethnic heterogeneity of the commercial fishers, the divisions do not seem to be so strong that they are able to break the ties that bind them due to the shared experiences of colonialism. This places them in opposition to the white Continentals, who are perceived to be descendents of the white colonialist Europeans who forced them into subordinate positions in the past. Most of the environmental management positions in St. Croix are held by white Continentals, and the fishers are quick to band together against those whom they consider to be “manipulative, dishonest
outsiders” who, despite being perceived by the fishers as having no right to control “their” resources, have the power to control management decisions. These dynamics of ethnicity currently impact fisheries management in St. Croix. This illustrates the importance of how colonial history has shaped ethnic relations in St. Croix and assists in understanding fisheries management and activities today. I will return to these points in subsequent chapters.
CHAPTER 5

THE DEVELOPMENT AND STRUCTURE OF US FISHERIES MANAGEMENT: DOCUMENTING MULTI-SCALE PERSPECTIVES IN ST. CROIX

Chapter Overview

This chapter describes the development and structure of fisheries management in the United States (US) and St. Croix, drawing from historical documents and other grey literature analyzed through archival research. I begin by describing the development of the first federal fisheries conservation agency in the US in the late 1800s, the Commission of Fish and Fisheries, including the rationale behind its development. I then trace the major changes in the structure of fisheries conservation and management in the US, and describe the impetus behind these changes (such as new scientific theories, changes to analytical frameworks, and Congressional mandates). This historical perspective is critical to this dissertation because it provides a more comprehensive understanding of the conditions and events that have resulted in the current management structure and the mismatch between the federal system and the small-scale fishery of St. Croix. Also important to my research is a discussion of how anthropological data, analyses, and perspectives have been increasingly accepted and included in National Marine Fisheries Service (NMFS) management decisions. I highlight current anthropological research trends within the agency, and discuss how they relate to St. Croix and my research questions regarding the importance of fishing to the island and stakeholders’ participation in the management process. The chapter concludes with a
description of the current structure of fisheries management in St. Croix, both at the territorial level and federal level, and a discussion of how management as it is actually carried out differs from how it is legislated to be carried out. To do this, I analyze data collected primarily through semi-structured interviews to describe stakeholder groups’ perceptions regarding the effectiveness of management bodies.

**Results: Findings from Archival Research and Analysis of Grey Literature**

**History of US Federal Fisheries Management**

The Commission of Fish and Fisheries (a predecessor of the NMFS) was founded in 1871 as the first federal conservation agency in the US. This signified the importance of fisheries to the US as a source of food, a way for its citizens to make a living, and as an important element of national recreation. The focus was on the “protection, study, management, and restoration” of fish (NOAA 2006). Throughout NMFS history, its research has largely focused on biological and physical data, stemming from Western ideas of the dichotomy between humans and nature, and reinforcing the idea that nature is something to be studied and that it can and should be controlled by humans. Even when it was recognized in the 1970s that many of the world’s fisheries were in a state of crisis, still the remedy was believed to be found in using biological data and technology to determine optimal population levels for fish species and to control the fish—something that we, as humans, were allowed and capable of doing (McGoodwin 1990; NOAA 2006). Only within the past ten years has the realization become more widespread that in order to keep our fisheries at sustainable levels, we need to manage the people—the fishers and others who come into contact with the resource and the ocean environment. This section describes this transition in US fisheries management.
Beginning in the 1790s, Secretary of State Thomas Jefferson expressed concern for federal fisheries, noting how fishers had been devastated during the Revolutionary War. The main reason for concern, however, was the important role that fisheries played in foreign trade and how such devastation affected the local economy (NOAA 2006). This concern was heightened by the depletion of species that were being fished off the New England coast, such as Atlantic salmon, trout, and shad. By the mid 1860s, several New England states had set up state fish commissions in order to explore the economic opportunities available through “fish culture” (predecessor to present-day aquaculture), which was becoming popularized in Europe. Spencer Baird, the Assistant Secretary of the Smithsonian Institution at the time, began to carry out his own research based on the concerns of local fishers regarding the fish declines (Hobart 1996). This led to the creation of the Commission of Fish and Fisheries in 1871, with Baird appointed as Head Commissioner. The Commission was charged with studying the reasons for the decline of several New England Atlantic Ocean and lake fishes and recommending solutions, as well as studying and promoting fish culture. In light of these goals, Baird organized the Commission’s activities into three main areas: (1) systematic biological and physical studies of US waters and fishes; (2) studies of past and present fishing methods and compilation of fish catch and trade statistics; and (3) the development of fish culture and fish “acclimatization” (efforts to introduce new fish to new waters) (Hobart 1996; NOAA 2006).

For the first 100 years of the Fish Commission (until the 1970s), the agency focused on collecting biological, ecological, and oceanographic data in order to understand the economic importance of fisheries as a marketable commodity (Russell
For example, fish catch and trade statistics generated by the Commission were used as marketing guides for the fishing industry and for educating consumers. Additionally, this data had practical applications for law, particularly for Congressional reviews of international treaties or in the imposition of tariffs (NOAA 2006; Weber 2002). The desire to conserve fishery resources was initiated by economic concern. “Much of the Commission’s efforts to promote fish culture were rooted in the concept as expressed by Baird’s assistant, George Brown Goode, that it was far better to make fish abundant and cheap so they could be fished with fewer restrictions than to just pass stricter laws to protect fewer and fewer fish” (Hobart 1996:5). Such a concept highlights the beliefs of those in charge of the “conservation of fish” that, as humans, we are able to control other species. Additionally, the fish “acclimatization” efforts explored during this time symbolized the belief that the answer to resource depletion problems could be overcome through human manipulation and technological innovation. Such perspectives greatly influenced how fisheries management in the US (and many other developed countries) was conceived and, as a result, how NMFS fisheries science is conducted.

To some extent the early research conducted by the Commission had elements of social science implicated into its research mandate. Baird recognized the ability of the fishers to identify particular species that were in a state of decline, and listened to their concerns about how the decline was affecting their livelihood (Hobart 1996). The focus on economics (considered a social science) also brought in what is considered today one of the “human dimensions” of fisheries and the importance of the management of the resource. However, it is important to note that these early conservation efforts were
implemented almost entirely in an attempt to find a way to *use* fisheries resources in a manner that was most beneficial to humans.

Throughout the late 1800s and the first half of the 1900s, the research of the Fisheries Commission (renamed the Bureau of Fisheries in 1903 and placed in the Department of Commerce) continued to focus on how best to utilize fisheries as a food source in the US. The Bureau focused on fishery marketing and product development, greatly encouraged by the federal government in response to food shortages resulting from World Wars I and II and their aftermaths (Hanna, et al. 2000). Paralleling similar movements occurring in the other bureaus responsible for the management of the US’ natural resources, the Bureau was affected by several laws that were passed to protect wildlife and game, such as the Lacey Act (1900) and the Black Bass Act (1926) (Weber 2002). These laws signified the change in attitude that humans were not only allowed and capable of exploiting natural resources, but that we needed to implement laws to ensure that these resources were managed properly. Additionally, widespread reorganization came to the Bureau in 1940, and it became one of the divisions within the Department of Interior's new Fish and Wildlife Service.

Throughout the 1940s and 1950s, the main goal of the US fishing industry (and most fisheries world-wide) was to harvest as much as possible. As fishing gear became increasingly specialized and research technologies became more advanced throughout this time period, new fishing grounds were discovered at a rapid rate and landings from both US and international waters grew exponentially (Hobart 1996). There seemed to be no limit to what gear and methods humans were capable of inventing or improving to increase harvests, nor to the amount of fish available for human use and consumption.
The 1940s and 1950s also brought changes in international fishery policies, as fisheries became increasingly globalized. The United Nations and its Food and Agricultural Organization (FAO) were established in 1945, and shortly thereafter many nations, including the US, set up distant-water fisheries utilizing large factory trawlers that could remain at sea for months at a time. In addition, several international fisheries commissions were formed, such as the International Commission for the Northwest Atlantic Fisheries (ICNAF) and the Inter-American Tropical Tuna Commission (IATTC) (NOAA 2006). With this increased globalization of fisheries came the need to protect not only fish stocks as a whole, but, more importantly, the desire to protect US rights to those fish stocks. For example, in 1945 President Truman claimed US rights over the resources of the continental shelf 20 (and within the corresponding high seas) off the nation’s coast so that the US could “protect and conserve” the resources within.

However, this was more a claim to the exclusive control of the use of those resources than to protect and conserve them for any other reason (Hobart 1996; Russell 2003).

Beginning in the 1960s, public, private, and governmental interest and concern for ecology and the environment was ignited when certain fisheries, such as the Pacific salmon fisheries of the Columbia River, began to show signs of decline. As a result, Congress established the Stratton Commission, a group made up of fifteen appointed scientists, researchers, and policy analysts from universities, laboratories, and other marine science institutions and four Congressional advisors (Merrell, et al. 2001; Russell 2003). The Commission was charged with reviewing all aspects of national marine science in order to recommend an overall plan for a coordinated and comprehensive

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20 The continental shelf is the portion of a continent that extends into the ocean until a marked increase in slope occurs; the high seas are any portion of the ocean that is not under the jurisdiction of any given nation.
national oceanographic program. On the basis of the recommendations of this group, President Nixon finalized the creation of the National Oceanic and Atmospheric Administration (NOAA) in 1970 under the Department of Commerce, which was charged with promoting “a unified approach to the problems of the oceans and atmospheres” (Hobart 1996:36). The Bureau was renamed and placed within NOAA as the National Marine Fisheries Service (NMFS), mandated to study and conserve marine fishes through “resource research, resource utilization, and resource management” (Hobart 1996:36).

The 1970s was an important decade for the federal management of marine fisheries in the US. The environmental movement gained strength throughout the world during that time and greatly influenced the manner in which marine fisheries were perceived and studied in the US. Legislation such as the National Environmental Policy Act (NEPA) of 1970 or the Clean Water Act (CWA) of 1972 indicated the country’s growing awareness of environmental degradation and increased commitment to keeping the environment clean (Weber 2002). Overall, the focus shifted from one of resource use to one in which conservation was seen as the answer to ensuring the continued use of natural resources. Many fisheries were showing signs of collapse by the early 1970s, such as the Pacific salmon fisheries of the Columbia River, and as a result, the Fisheries Conservation and Management Act of 1976 (later renamed Magnuson-Stevens Fisheries Conservation and Management Act, or MSA) was developed and implemented (McGoodwin 1990). This legislation established controls on fishing and put a framework in place for the scientific study and comprehensive management of fisheries (Colburn, et al. 2006; Sepez, et al. 2006). More specifically, it accomplished several things. First, American fishing waters (called the Exclusive Economic Zone, or EEZ) were claimed
from state boundaries out to 200 miles from the shores of all US states and protectorates. Foreign fishers were no longer allowed to fish in these waters, except in certain circumstances where the US granted permission for them to do so. Second, eight regional fishery management councils were created to manage the fisheries important to their areas. The councils were to be made up of individuals from many different stakeholder groups, such as local fishers, members of communities in the region, others working in the seafood industry in the region, and biological and environmental scientists. The councils were charged with the development of fishery management plans (FMPs) for their regions’ main fisheries (the main species of fish targeted). Third, the MSA called for increased investment in the US seafood industry, and programs were developed to promote domestically-caught seafood and to help improve fishing gear and technology. Finally, “the Act recognized the economic, social, and environmental value of marine resources and called upon regulators to manage these finite, but renewable, resources for the long-term benefit of the nation” (NOAA 2006:n.p.). When it was established, the council system was considered progressive because it recognized that fisheries needed to be managed in order to ensure their long-term stability, set up specific bodies that were responsible for that management, and included local stakeholders and resource users in management decisions through a participatory process. However, it is important to note that the MSA continued to promote large-scale investment and

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development in US fisheries, and reinforced the reliance on biological data and the development of fishing technologies.

Although a few US fisheries were seen to be “in trouble” during this time period (1960s and early 1970s), such as the groundfish in the waters of New England and some of the salmon runs on the west coast (Hanna, et al. 2000), the general belief persisted that fisheries were an infinite, renewable resource. The major threats were believed to come from foreign fishing fleets, and as long as foreign fishers were kept out of US waters, fishing would continue to be a profitable enterprise for the country. The models used by fisheries scientists to establish MSA regulations were based on Hardin’s (1968) “tragedy of the commons” theory, which assumes all users of common resources will use them limitlessly to maximize individual profit with no regard for the long-term use of the resource (see Chapter 2 for a more complete description of the “tragedy of the commons” and subsequent critiques of the model). This justified the use of centralized, governmental control of fisheries resources, which is what the MSA established in the US (Colburn, et al. 2006). There was little recognition by US fisheries managers at the time, however, that management models based on Hardin’s theory failed to take into account local commons management strategies that were already functioning in some locations to manage fisheries sustainably.

The implementation of the MSA, however, did reflect the growing realization within NMFS that it was necessary to have an understanding of human behavior and American fishing culture and communities if fisheries management strategies were going to be successful (Colburn, et al. 2006). As a result, NMFS hired four social scientists between 1974 and 1981: three anthropologists (James Acheson in 1974, Michael Orbach
in 1976, and Raoul Anderson in 1979) and one sociologist (Peter Fricke in 1981). Although these researchers contributed to several aspects of the agency’s work, including policy creation, policy implementation, and regulatory work, the general belief among agency employees, who were mainly biologists and other physical scientists, was that there was little use for social science in fisheries management. The perspective of most of these individuals (and of NMFS overall) was, and to some extent continues to be, that the remedy of the fisheries crisis was to be found in using biological data and technology to determine optimal population levels for fish species and to control the fish—something that we, as humans, were capable of doing (McGoodwin 1990; NOAA 2006). From their perspective, fisheries management should be based on scientific data and those individuals dependent on the fisheries should abide by those regulations.

By the 1980s, the results of large-scale research programs, such as Marine Resources Monitoring Assessment and Prediction (MARMAP), showed the deleterious effects that overfishing and the rapid development of US coasts (which led to the decrease and degradation of important habitat) were having on fish distribution, abundance, and stock composition (Weber 2002). It was becoming increasingly clear to US fisheries managers that FMPs based solely on biological and economic data were not successfully preventing the collapse of many US fisheries. The focus of NMFS began to shift from one of how to best capitalize on the nation’s fisheries resources and to increase investment to how best to keep those fish stocks from falling to irrecoverable levels.

By the mid 1990s, the fate of US fisheries continued to look bleak. In 1994, the New England multi-species fishery was closed by the Secretary of Commerce after scientists documented collapsed stocks of haddock and yellowtail flounder off southern
New England, as well as a cod stock close to large-scale collapse in the North Sea and off Newfoundland (Hanna, et al. 2000; Weber 2002). The resulting impact on the fishing community and accompanying media attention led to additional scrutiny of fisheries management activities and increased awareness of the need to examine the social aspects of fisheries. Additionally, several other factors contributed to an environment in which anthropological data and approaches were more readily implemented in NMFS research in the 1990s. In the early 1990s, the MSA was amended to require that a fishery impact statement (FIS), which specified the likely effects proposed conservation and management measures might have on fisheries participants and communities, be included with each FMP. In addition, several lawsuits were successful against NMFS on the basis of inadequate social and economic impact analysis (Gade, et al. 1995; Olson 2005). Moreover, upon being pressured by constituents involved in marine fisheries, Congress was more willing to dedicate new funding for social science research, and top-level administrators at NMFS were willing to use it (Colburn, et al. 2006).

The combination of these factors in the early 1990s led directly to the implementation of the Sustainable Fisheries Act (SFA) as part of the MSA in 1996. The SFA made mandatory the assessment of the effects new fishing regulations or changes to existing regulations could have on fishers and fishing communities, but also the protection of fish stocks from overfishing and collapse (Weber 2002). The resulting legislation was extremely complex and, in many cases, a step ahead of NMFS capabilities. For example, the MSA now largely focused on the restoration and rebuilding of fish stocks, but in a manner that limited the negative social and economic impacts on fishers and fishing-dependent communities (Hobart 1996). Attaining such a
goal is much easier said than done, and NMFS researchers and policymakers did not (and to some extent, still do not) have the necessary data and tools to accomplish such a major task.

NMFS Approach to Fisheries Management Today: The Ecosystem Approach, Anthropology, and the Sustainable Fisheries Act

Beginning with the passing of the SFA in 1996, NMFS has turned its focus to an ecosystem approach. NOAA describes this ecosystem approach as “one that considers all living resources within a marine area, all sources of environmental stress, and all factors influencing the ecosystem in making management decisions” (NOAA 2006:n.p.). Reflecting long-standing trends in the fields of ecology and natural resource management, this is a shift from the agency’s former management approach which focused on one issue or resource in isolation, without considering impacts or factors from other ecosystem components. In regards to fisheries management, this means making decisions using a comprehensive, inclusive framework for multiple living resources instead of focusing on the population status of a single fish species (Weber 2002). Additionally, it means focusing on the sustainability of US fisheries, which NMFS defines as fisheries that can “provide for today’s needs without damaging the ability of future generations to provide for themselves” (NOAA 2006:n.p.). Furthermore, included in the goals of NOAA’s stated ecosystem approach is balancing the needs of the environment with the economic, social, and recreational needs of the people who use the environment. This is difficult to do, however, in practice, especially within a science and management body such as NMFS which continues to be dominated by the collection of biophysical data.
In order to achieve the goals of an ecosystem approach as described above, as well as those prescribed by the SFA, however, NMFS has had to rely increasingly on anthropological research. The SFA amendments to the MSA in 1996 made it mandatory to include the effects that new fisheries regulations or changes to existing ones would have on humans (fishers and fishing communities\textsuperscript{22}) in the FMP development process. This was the real impetus to including non-economic social science research in federal fisheries management. Although this movement had a slow start, beginning in 2001, anthropologists have been added to the staffs at five of the six NMFS Fisheries Science Centers and one of the six Regional Offices, which coordinates its efforts with headquarters staff (Colburn, et al. 2006). Many of the early efforts of these anthropologists have focused on the implementation of one of the SFA amendments to the MSA. In particular, National Standard 8 (NS8) demonstrates the importance of including sociocultural analyses with economic analyses. NS8 states:

Conservation 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 (US Congress 1996:n.p.).

In order for such requirements to be met, baseline social, cultural, and economic data had to be gathered regarding fishing communities at the national level. Although legislation prior to the MSA amendments in 1996 required that Social Impact Assessments (SIAs) be carried out before new regulations could be implemented, such data was often written off as “unavailable” (Abbott-Jamieson and Clay, personal communication, 2007). That

\textsuperscript{22} A more thorough examination of the term “community” and the implications of how this term is defined regarding fisheries management is included later in the chapter.
was no longer acceptable after 1996, and the first thing that needed to be done was the gathering and compilation of this kind of data. Each of the NMFS regions was charged with carrying out these “community profiles,” which would then provide the baseline data for future management decisions. Through cooperative efforts across the NMFS regions, the social scientists worked to develop a framework for developing community profiles that would be comparable across regions. Both time and budget limitations required these profiles to be relatively short (five to eight pages per community), and utilized information that was either already available from secondary data sources or that was easy to gather in a short period of time. Currently, 819 of these “short-form profiles” have been completed, distributed across 23 coastal states and territories (Abbott-Jamieson and Clay 2010). The goal is for these profiles and their associated databases to be updated every three to five years, so that current information and long-term trends will be available for every SIA undertaken when a new or changed regulation is proposed. Now that the initial round of the short-form profiles have been completed, social scientists from each region are using various methods of ground-truthing in order to assure the validity of these profiles based largely on secondary data. In some regions, such as the Western Pacific and the Caribbean, these efforts have been longer ethnographic narratives, focusing on the validity of designating an entire island as a single fishing community (Levine and Allen 2009; Stoffle, et al. 2009). In other regions, such as the Northwest, quantitative indicators were used to select communities in which to complete more in-depth ethnographic studies, with the goal of not only choosing communities that were the most representative of the region, but also choosing

23 The Western Pacific region includes Hawaii, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands. The Caribbean region includes Puerto Rico and the US Virgin Islands.
communities that allowed for a large amount of diversity (Abbott-Jamieson and Clay 2010; Clay and Olson 2007).

The MSA was again reauthorized and amended by Congress in 2006. The revision added specific programs geared toward ending overfishing in US fisheries through the use of annual catch limits (ACLs; see Chapter 7 for a more complete discussion of ACLs), promoting market-based management approaches, improving and increasing the role of science in the decision-making process, and enhancing international cooperation. These changes again reinforced the need for the collection and analysis of socio-cultural data. The following section describes some of the limitations of the approach codified in the MSA and how anthropological research intersects with the current status of fisheries management in the US.

Current Anthropological Research Directions

To a large degree, this transition in the US federal fisheries management approach to include anthropological and other sociocultural data has dictated the current research directions of fisheries anthropologists—those who work in cooperation with NMFS as well as those who work in academia, for non-governmental organizations (NGOs), or other research institutions. This is because the first main task the NMFS anthropologists were charged with—gathering baseline social, cultural, and economic data of the “fishing communities” (as required by the 1996 MSA amendments)—created many new questions that an anthropological perspective is well-suited to answer.

For fisheries anthropologists trying to operationalize the term “fishing community” used in NS8 of the MSA, one of the main difficulties that arises is that there is no single definition that is appropriate for use in all cases. Great variation exists
among the different regions of NMFS, as well as among “communities” within each region, at multiple levels. These include biophysical factors (fish populations found in the area, seasonal currents that may influence which species are found in a particular location during a particular season), economic factors (market prices for species, what other income-earning industries exist in the area), and sociocultural factors (history of fishing in the area, cultural and familial ties to the industry) to name a few (Colburn 2006; Ingles and Sepez 2007). This has sparked anthropological and interdisciplinary research regarding how to conceive of a “fishing community.” The definition used in NS8 is, essentially, a place-based definition of community. This implies that a fishing community is tied to a particular geographical location (whether that be a village, town, municipality, city, or other geographic entity), and that it is somehow dependent on fishing (economically, socially, or culturally). The idea is that this “community” (individuals, businesses, groups) can be bounded in a way that separates it from surrounding areas based on this relationship with fishing (Clay and Olson 2007). While there are scholars who agree with this approach (Jacob, et al. 2001), there are many proverbial “flies in the ointment.” For one thing, this approach downplays the importance that social and cultural ties may have in linking individuals who live outside of the defined geographical place. Is an individual who spends most of his or her time within the defined area and participates in the fishery not considered part of the community if his/her permanent residence is outside that defined place? In addition, because the MSA applies to all US fisheries, including those that are recreational, the validity of web-based, online “communities” is called into question. Many recreational fishing “communities,” such as eastern Atlantic billfishers, are not connected to any one
geographical location. Quite often these are individuals who travel to different locations on the east coast of the US (such as Ft. Lauderdale and Miami, Florida) in order to fish for these species (Grace 2006). If such a “fishing community” of billfishers cannot be considered as such by the MSA definition, then how can the impacts of FMPs on these kinds of communities be taken into consideration to the same extent as those of an isolated, resource-dependent community in rural Alaska that might fit the “fishing community” definition more clearly (Clay and Olson 2007; Jacob, et al. 2001)?

In addition to issues stemming from the concept of “fishing community,” the MSA’s emphasis on “fishing dependence” is also contentious. According to the MSA, a fishing community is one that is “substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs” (US Congress 1996:n.p.). However, what makes a community “substantially dependent?” Some fisheries anthropologists have taken a highly quantitative approach, creating a methodology to rank communities on their “fishing dependence” based on multiple indicators, such as various landings, permits, and vessel data (Sepez, et al. 2007; Sepez, et al. 2006). Others argue that a community should be considered as “substantially dependent on” or “substantially engaged in” fisheries if community members hold strong cultural beliefs about the importance of fishing to the community, even if income from the fishing industry is only a small part of overall income (Clay and Olson 2007). Or, for example, other anthropologists suggest that even a historical connection to fisheries—what Griffith (1999) has called a “cultural biography” and Jacob and colleagues (2005) have called a “heritage narrative”—should be enough to claim fishing dependency and involvement.
Linked with questions of how to define these concepts is the discussion of what being designated a “fishing community” actually means. Following the precedent set in the US Western Pacific region where the eight major inhabited Hawaiian islands, American Samoa, Guam, and the Commonwealth of the Northern Mariana Islands have each been designated a “fishing community,” St. Thomas and St. Croix have each been designated as such. Though perhaps designating an entire island area a “fishing community” was not what SFA developers intended, NMFS social scientists and other researchers in these regions developed sound and meaningful arguments as to why islands present unique cases (Allen 2009; Allen and Glazier 2005; Stoffle, et al. 2009). These include the fact that as opposed to most mainland residents, a large proportion of island residents interact with the ocean on a daily basis for food, income, or recreation, and that “fishing continues to contribute to the cultural integrity and social cohesion” (Western Pacific Regional Fishery Management Council 1998:52). Additionally, in the case of St. Croix, Stoffle et al. (2009) justify island residents’ dependence on marine resources with the fact that close to 100 percent of the harvested marine resources are landed, purchased, and consumed in St. Croix. The next question, however, is what does this designation mean? Should designated communities be afforded special privileges or considerations when the regional councils are developing FMPs? Or, should they be exempt from certain kinds of regulations? These questions do not have answers currently, and NMFS social scientists are beginning to discuss this issue in the hopes of developing a guide to the implications of fishing community designation that is applicable across regions.
The wording used in the MSA definitions of “fishing community” or in reference to what it means for a community to be “substantially dependent on or substantially engaged in” the fishery was purposely written as such to avoid numeric metrics and to instead embrace more general terms open to interpretation. The problem is, however, just that; they are, in fact, open to interpretation and what is a meaningful way to interpret the terms in one case (or NMFS region, for example) is not necessarily meaningful in another (Clay and Olson 2007). This issue brings to light the ongoing struggle of how to combine anthropological data, which is not always quantifiable, with the quantitative biological and economic data usually used in NMFS policymaking. Some anthropologists feel that the most effective way for anthropological data to have an impact on fisheries policy is to present it in a quantitative form that is more easily understood by the policymakers, biologists, and economists with whom they work (Jacob, et al. 2001; Sepez, et al. 2006). In this case, even if sociocultural data is collected in qualitative format via interviews, participant observation, or other ethnographic methods, they feel it should be analyzed in a quantitative format that is more easily understood in the policy arena. For proponents of this argument, while presenting data in this format has the potential to lose much of the contextual information important to anthropological analysis, this is the best way for anthropological data to be given the same level of importance in the FMP development process, because it is, essentially, putting anthropological data in “their language” (Abbott-Jamieson and Clay, personal communication, October 24, 2007). Others reject this perspective, claiming that it is also important to not completely give in to the US-driven bio-economic science data model in which everything must be reducible to specific numeric amounts or dollars and cents.
Rather, fisheries anthropologists must work with fisheries biologists and economists to promote cross-disciplinary understanding and to develop perspectives, methods, and analyses that incorporate both quantitative and qualitative data (Clay, personal communication, October 24, 2007; Colburn, personal communication, October 15, 2007; Griffith 1999).

Anthropologists employed by or working in collaboration with NMFS have also conducted research regarding whether, how, and why fishers and members of other stakeholder groups participate in the fisheries management process. Several studies have focused on the regional fisheries management council system as established by the MSA in 1976. For example, Wilson and McCay (1998) examined how members of different stakeholder groups involved in the management process (such as commercial fishers or council members) view different types of “participation,” and how an understanding of these different perceptions can assist in the attainment of management goals. Hanna (1995) examined three cases in which “users” (the title she gives to individuals involved in the commercial fishing industry) participated in management processes in the Pacific Fishery Management Council, and sought to understand what conditions contributed positively to collaborative management experiences. The results of these studies indicated that there is more to a participatory management process than just creating a forum (such as public hearings) in which fishers and other stakeholders have the opportunity to provide comments on proposed regulatory changes. Additionally, they have identified many challenges associated with defining what “participation” means for the different groups involved, and the extent to which groups and individuals perceive that participation to be legitimate. They suggested the need for further research in order
to understand how other factors influence participation, such as demographic variables (Brzezinski, et al. 2010) and the extent to which regulations and the management process itself is considered to be legitimate24 (Jentoft 2000).

With this dissertation I build upon this research by examining how historical, social, and political factors influence how fisheries management processes are carried out in St. Croix and the extent to which commercial fishers and others participate in those processes. For the purposes of this dissertation, I define “participation” as individuals’ involvement in the regional fishery management council process as suggested and promoted by the system itself; mainly through attendance of meetings and providing oral or written statements regarding the council’s proposed management actions. This is discussed in more detail in the next section.

Despite the recent interest in the co-management of fisheries, not much has been written since the mid- to late-1990s about fishers’ or other stakeholders’ participation in fisheries management and the development of FMPs in the US. Although the structure of fisheries management as designated by the MSA is advertised by NMFS as participatory, and an opportunity for fishers (commercial and recreational), other industry participants, and “the public” to share their opinions and influence the development of fisheries regulations, most scholars and researchers would agree that the true potential in the system for co-management has not been tapped (Hall-Arber 2005).

With this in mind, there have been a few papers and book chapters published since 2005 that provide case study descriptions of collaborative or cooperative arrangements between a regional fishery management council and commercial fishers.

24 According to Zarger (2003), legitimacy is “the perceived success and fairness of any environmental decisions or management plans from the view of all interested and affected stakeholders” (n.p.).
For example, Madeleine Hall-Arber (2005) describes the process through which New England commercial groundfishers25 worked with the New England Fishery Management Council (NEFMC) to develop groundfish regulations. Unsatisfied with the group of management strategies proposed by the NEFMC to reduce overfishing and begin stock rebuilding, several fishers’ organizations developed their own sets of proposed regulations. Ultimately, the proposal that was selected by the NEFMC had elements of adaptive management, which is characterized by mechanisms which allow certain regulations to be altered by the fishers themselves without requiring approval from the Council. Hall-Arber suggests that several factors impacted the ability of such an arrangement to be reached, including the fact that the organization whose proposal was chosen was seen by NEFMC members and others to represent the interests of several different stakeholders in the industry and the key roles played by important and well-respected members of NMFS and the fishers’ organization. She believes this case shows the potential for adaptive co-management to be realized within the current fishery management council structure (Hall-Arber 2005). Kitts, Pinto da Silva, and Rountree (2007) and Pinto da Silva and Kitts (2006) also describe cases from the Northeast region in which fishers worked with the regional fishery management councils to develop regulations. It is important to note, however, that the cases described occurred in the Northeast region, and it is unclear if these opportunities for cooperation between fishers and the council exists in NMFS’s other regions, such as the Caribbean region described here.

It is clear that these researchers’ experiences in New England are not representative of all NMFS regions, and important questions need to be answered.

25 Groundfishers are fishers who fish for bottom-dwelling fishes, such as cod, haddock, and flounders.
regarding how the management process is carried out in different locales and under different circumstances. Of particular interest is the fact that in these cases from the New England region, fishers’ organizations played important roles in the establishment of collaborative arrangements. This echoes the findings of other anthropologists and commons scholars (as described in Chapter 2) regarding the crucial role legitimate, local-level stakeholder institutions play in achieving effective management (Berkes 1986). In Chapter 9, however, I examine the potential for collaborative management arrangements to develop in St. Croix, where well-established fishers’ organizations do not exist, as well as what factors may prevent these developments. First, however, it is necessary to describe how the federal and territorial fisheries management processes are carried out in St. Croix, and how those processes diverge from how they are legislated to be carried out.

Results: Current Structure of USVI Fisheries Management

In order to examine how commercial fishers and other stakeholder groups participate in the management process in St. Croix, I wanted to first understand the territorial and federal regulations in place regarding fishing as well as the management bodies charged with the development and enforcement of those regulations. The management of USVI marine resources is shared between the territorial and federal governments. The territorial government has jurisdiction over the resources within the territorial sea, which extends from the shoreline out to three nautical miles. The federal government has jurisdiction between three to 200 nautical miles from the shoreline. This section describes fisheries management in both jurisdictions in St. Croix, then draws upon data from semi-structured interviews to examine how day-to-day realities of fisheries management in St. Croix differ from the way it is legislated to be carried out.
Results: Findings from Analysis of Grey Literature Regarding the Structure of Territorial Fisheries Management

In this section, I describe territorial fisheries management bodies. First I introduce the regulatory bodies involved and describe how they are legislated to carry out local fisheries management. I then describe the main laws, regulations, and territorial marine managed areas currently in place to manage territorial fisheries. Next, I utilize data collected through semi-structured interviews to describe participants’ perceptions regarding the effectiveness of management bodies. This discussion highlights the ways in which territorial management as it is actually carried out diverges from how it is legislated to be carried out.

Territorial Management Bodies

The USVI Department of Planning and Natural Resources (DPNR) is responsible for the conservation and management of the marine resources of the territorial sea. Of DPNR’s eleven divisions, two—the Division of Fish and Wildlife (DFW) and the Division of Environmental Enforcement (DEE)—are most directly involved with fisheries management. DFW is charged with “monitoring, assessing and implementing public awareness and other activities that help to enhance and safeguard fish and wildlife resources in the USVI” (DPNR 2005a). DFW monitors the commercial and recreational fisheries and provides management advice and guidance to the DPNR Commissioner, who is appointed by the governor. Rules and regulations are codified in the Virgin Islands Rules and Regulations (VIRR). Rules and regulations are enacted by the executive branch, while laws are enacted by both the executive and legislative branches. DEE “serves as the law enforcement arm of the Department of Planning & Natural
Resources. Its primary function is to enforce all laws applicable to the protection, preservation and conservation of the natural resources and overall environment of the USVI” (DPNR 2005a). Regarding fisheries management, they are responsible for the enforcement of all fisheries regulations as well as boating safety.

Additionally, each district (St. Thomas/St. John and St. Croix) has a Fisheries Advisory Committee (FAC) made up of up to 14 members from a variety of stakeholder groups, including commercial fishers, marine scientists, dive operators, recreational fishers, and government agencies. The FAC is responsible for collaborating with DFW “in the drafting and administration of rules and regulations for the promotion and conservation of the fishery resources of the United States Virgin Islands” (USVI Legislative Act 3330 1972). The FAC makes recommendations on fisheries issues (either for an individual district or for the territory as a whole) to the DPNR Commissioner, who typically requests a public hearing on the recommendation to allow the general public to provide input into the management options. Based on the results of public hearings as well as advice from DFW and DEE, the Commissioner can either issue a regulation or can recommend adjustments or amendments to the VIRR (DPNR 2005b).

Territorial Fishing Regulations

The USVI territorial government has several fisheries regulations in place in order to conserve and manage its resources (for a complete list of all regulations, see DPNR 2010). Most regulations apply to both commercial and recreational fishers. There are minimum size limits on many species, including queen conch, whelk, and Caribbean spiny lobster. Additionally, there are closed seasons for certain species, such as queen conch, whelk, and many snapper and grouper species, during which possession of those
species is illegal. Some species, such as goliath grouper and Nassau grouper, are protected through both harvest and possession restrictions. The territory also places regulations on particular commercial gears, such as traps, requiring minimum mesh sizes and biodegradable escape panels, for example. All commercial fishers are required to have a current fishing license, and there has been a moratorium on the issuance of new commercial licenses since August 2001. All commercial fishing license holders are also required to submit monthly commercial catch report forms (CCRs) to DFW by the 15th day of the following month (even if not actively fishing commercially), and to provide DFW with four port samples per commercial fishing year (July 1—June 30). Currently, recreational fishers are not required to hold a recreational fishing permit, though the process has begun to develop and implement a recreational license and catch reporting program. Recreational fishers are not allowed to use certain gears, including pots, traps, haul seines, and set-nets. DEE is responsible for the enforcement of these regulations.

**Territorial Marine Managed Areas**

In addition to fishing regulations, several marine managed areas have been established within St. Croix’s territorial waters (see Figure 4). Buck Island Reef National Monument (BIRNM) was established in 1962, with additional marine portions added in 1975 and 2001, and is managed by the National Park Service (NPS). Currently, BIRNM is 71 hectares (175.4 acres) of land and 77.7 square kilometers (30 square miles) of submerged land, 9 square kilometers of which is within St. Croix’s insular shelf (DPNR 2005b). Although only a small eastern section (49.7 hectares) was originally designated
Figure 4. Map showing territorial and federal marine managed areas in St. Croix’s territorial waters and exclusive economic zone. Map by Liam M. Carr.
as a no-take zone, the entire expanded area was declared a no-take and no-anchoring zone in 2001.

Additionally, the St. Croix East End Marine Park was established in 2003, and is managed by the USVI government. The park encompasses approximately 155 square kilometers (about 60 square miles), and consists of four different management zones which allow for varied levels of take and activities, including fishing. Although the park’s management rules and regulations were promulgated in 2007, enforcement of the different management zones cannot occur until boundary zone markers have been installed (DPNR 2008).

Salt River Bay National Historic Park and Ecological Preserve was established in 1992 and is managed jointly by the NPS and the USVI government. The park and preserve is made up of about 1.6 square kilometers (.62 square miles) of land and 2.5 square kilometers (.96 square miles) of water. Take of any species is not allowed in this area (DPNR 2005b).

All fishing is also prohibited within the Mutton Snapper Spawning Aggregation Area, from March 1 to June 30 each year. This is an area of approximately 3.75 square kilometers (1.45 square miles) south of St. Croix and encompasses both territorial and federal waters (DPNR 2005b).

Results: Findings from Semi-Structured Interviews Regarding Legislation versus Observed Practice of Territorial Fisheries Management

One of the goals of this dissertation is to document the current structure and practice of fisheries management in St. Croix in order to understand the extent to which fishers participate in the management process. To do this, I sought to fully understand
not only how fisheries management is *supposed* to be carried out based on laws, regulations, and agency mandates, but also the challenges managers face as they perform their prescribed roles. In other words, distinguishing between what people say they do or are supposed to do, and what actually takes place in day-to-day interactions—a classic anthropological concern. This section utilizes data gathered primarily through semi-structured interviews to describe the “on-the-ground” reality of territorial fisheries management in St. Croix. Major management challenges identified by participants are presented in this section, organized by the management body with which they are associated in the following order: (1) Department of Fish and Wildlife (DFW), (2) Division of Environmental Enforcement (DEE), (3) lack of cooperation between DFW and DEE, and (4) St. Croix Fisheries Advisory Committee (FAC).

Ideally, DFW and DEE are designed to work together to ensure proper management of territorial fisheries resources. Regarding commercial fisheries, DFW is responsible for conducting scientific research to assess the health of the fisheries and using the data provided by fishers through CCRs and port sampling to assess trends in catch and effort. This information is then used to provide advice to the DPNR Commissioner and the FAC regarding territorial management issues. For this data to be correct and in order for management measures and regulations to achieve their goals, proper and effective enforcement by DEE is absolutely critical. This involves ensuring only licensed commercial fishers are fishing commercially (e.g., using fish traps) and selling their catch, only using legal gears, only keeping fish that meet size and species requirements, not keeping certain species during closed seasons, and not fishing in restricted areas. The data collected indicate there are a suite of challenges plaguing
territorial fisheries management. These include a lack of funding and other resources, lack of local government support, and issues with personnel and human resources. I describe below how these issues (and others) impact the management bodies’ abilities to perform their management duties as legislated.

Department of Fish and Wildlife (DFW)

A major problem that impacts commercial fisheries management in St. Croix is the lack of funding available to DFW and DEE to be used for activities relating to commercial fisheries. DFW receives little to no local support, and funding is almost exclusively from two main sources: 1) Division of Federal Aid, US Fish and Wildlife Service (USFWS), Department of the Interior, and 2) NMFS, Department of Commerce (DPNR 2005b). For this reason, much of the research conducted by DFW is based on the needs and goals determined by particular federal agencies or grant programs that are often not in line with the territory’s specific needs. All current or past employees of DPNR who were interviewed described the lack of funding as a major challenge they faced in their positions. As one past DFW employee explained:

85 percent of our funding comes from US Fish and Wildlife. This means that only 15 percent comes from the Department of Commerce, which is what we’re allowed to use for commercial fishing issues. So we are very restricted in that way. It’s hard for us to support the commercial fishers.

One example where this was apparent was regarding port sampling. Commercial fishers are required to provide DFW with four port samples of their catch per year. Ideally, these should occur randomly and fishers should not know prior to arriving at the dock that their catch will be sampled. Funding restraints, however, do not allow for full-time port sampling positions, and those who are port samplers also have many other job duties. For this reason, fishers are asked to call DFW prior to dock arrival to schedule their port
samples. In regards to port samplers getting unbiased and representative samples of commercial catches, this method is obviously flawed in that if fishers know they will be sampled on a given day, they are able to alter their catch behaviors and only keep legally sized fish, for example. Moreover, many fishers voiced frustrations at the lack of availability of port samplers. As one long-time fisher explained:

*I try to follow the rules, so I have no problem giving these guys the chance to look at my catch. And, we have to provide at least four a year. That’s no problem. What pisses me off is that I call ahead to tell them they can sample me, and then they don’t show up. Either they can’t do it that day, or they don’t have a way to get to the port, or they say they’ll be there, but don’t come. That’s what’s happened the last three times I called. The last time, I waited an hour at the dock and they never showed up. Why should I keep calling and trying to do what they want me to do? It’s their job to come to me... I shouldn’t have to harass them to do their job.*

Other fishers shared similar frustrations with me regarding the port sampling procedures. It was clear that this has been an ongoing problem, and one they did not expect to be solved in the near future.

The lack of funding also means that those in DFW supervisory positions spend a great deal of their time looking for new funding opportunities and managing the grants that are already in place. This is complicated by the fact that the hiring process is extremely lengthy and inefficient, which results in vacant positions not being filled for many months or even years at a time. Individuals in those positions that are filled then have to perform not only their own job responsibilities, but also those of the vacant positions. Many important duties fall by the wayside, especially when the vacant positions are supervisory positions such as the Director of the Division of Fish and Wildlife or the Chief of Fisheries. For example, until recently, the Chief of Fisheries position was vacant for several years, which resulted in the loss of a large amount of
federal funding simply because paperwork was not completed and requirements for the use of the funds were not met.

All current or past DFW employees who were interviewed also felt the hiring process and personnel issues within DPNR were a major challenge and kept DFW from operating as it should. As one current employee described:

*From the time I first applied for this position until I actually started working here, it took about two years. And that was for this pretty high-up position, but there are just so many hoops to jump through and no one follows through with anything. And now I’m dealing with it on the other end, when I want to hire people. I have to make calls every day to try to get the paperwork to go through. And how can we compete with other employers for decent applicants? How do I tell a recent graduate to come and work for us when it can take over a year for them to get hired? They need a job right away. I can’t expect them to wait. So, it’s really frustrating.*

Another past DFW employee described how this lengthy—and often political—process also creates a barrier for local, qualified applicants:

*It would be great to get the young adults who grew up here to stay and work locally. Who better to manage the local resources than those who really know and care about them? But those who are truly capable just want to go off island, to go to Puerto Rico or the mainland. Not only is it because it could take forever for them to get a job, but the hiring process gets totally political. If the person who has to process your hiring paperwork doesn’t like you, or some member of your family, or distant cousin, or neighbor, then your application will just sit on that desk for months. And, there’s nothing anyone can do about it.*

As a result, there are few people from St. Croix working as scientists or in supervisory positions in DFW, which continues to promote the perception of managers as non-local “outsiders” versus fishers, who are considered local.

Another factor adding to the political nature of DPNR and DFW is the fact that many of the supervisory and decision-making positions are filled through governor appointments. While one of the advantages of this is that candidates for these positions
do not have to go through the same lengthy hiring process as those applying for other positions and are therefore often able to take on their new jobs much more quickly, it does mean those selected to fill these positions may not have adequate experience in fisheries management. Several DPNR employees as well as FAC members believed this was a major barrier to effective fisheries management in St. Croix. Many described how this translated into a lack of support for fisheries issues as well as environmental issues as a whole, as this individual stated:

We’ve had individuals in leadership positions before who knew nothing about fisheries. So, they’re not really involved at all. They let whoever’s been at DFW the longest tell then what to do. Which really defeats the purpose of even having anyone in that position if you ask me.

Additionally, the fact that these positions are appointed means that there is a high rate of turnover—almost every four years—usually coinciding with the election of a new territorial governor. One long-term DFW employee voiced his frustrations regarding this:

It just creates a lot of inconsistency. One person will be really involved and helpful and will really pay attention to what’s going on with the fisheries, and we’ll get a really good thing going. But then the next person comes in and they have a totally different background with a totally different agenda and they don’t pay attention to DFW at all. How can we do our job effectively if we don’t get the support we need? And, it’s hard to stay motivated if we know that whatever progress we make might be abandoned in another few years.

As a result, many long-term DFW employees have to expect these inconsistencies in the amount of support they receive from their superiors. In many cases, they resign themselves to focus on the aspects of their jobs that they themselves are capable of controlling.
Taken as a whole, the lack of funding and resources, the political nature of the hiring process and other personnel issues, and the inconsistencies in involvement and support from those in leadership positions create an ineffective and frustrating workplace environment for DFW employees. As a result, agency employees struggle to carry out the “monitoring and assessment” that is required to help “enhance and safeguard” USVI fish and wildlife resources. Without accurate and consistent data being collected, it is difficult for territorial fisheries management to retain the status quo, and nearly impossible to expect them to be improved.

Division of Environmental Enforcement (DEE)

DEE also faces many challenges in regards to territorial fisheries management, which prevent the agency from fully and effectively performing their duties as mandated by the local legislation. Many of them are similar to those faced by DFW, but others are unique to the division. As DEE officers, they are responsible for the enforcement of laws and regulations relating to all eleven DPNR divisions. During my tenure in St. Croix, there were only six DEE officers located on St. Croix, and all but one of the DPNR employees interviewed felt that there were not enough DEE officers to perform their vast number of duties effectively. As with DFW, all of their funding is provided federally, and so the time spent on their various duties largely reflects that prescribed by the federal agencies and grants from which they receive their funds. For this reason, most of their time is spent enforcing environmental laws and regulations not associated with fisheries. This means there is limited funding available to be used for fieldwork geared towards commercial fisheries enforcement or ensuring the gear needed for patrols, such as DPNR
boats, are in working condition. Additionally, they simply do not have enough time or manpower to conduct regular patrols on the water in order to enforce regulations relating to closed areas or to board fishing boats to check for illegal species or sizes of catch.

Past and present DPNR Commissioners and Directors of the Division of Environmental Enforcement who were interviewed indicated that the recruitment and retention of DEE officers was a major problem for the division. While future DEE officers and police officers go through the same training program, regular police officers are offered a much higher starting salary. As a result, many qualified individuals take the higher-paying positions, leaving DEE with a shortage of officers.

Other challenges faced by DEE stem from the lack of a comprehensive set of commercial and recreational fishing regulations. Although there are a variety of commercial fishing regulations on the books, and a commercial fishing license is required to sell fish, the lack of recreational fishing regulations can make enforcement complicated. An illustrative example of this occurred one day as I was conducting participant observation while helping DFW port samplers identify, measure, and weigh a commercial fisher’s catch. Several commercial fishers had complained to both DFW and DEE about a particular fisher who was fishing illegally. Not only did he not have a license, but he was taking fish out of season as well as scraping the bellies of pregnant “berried” female lobsters before bringing them in to shore, both of which were illegal. Two DEE officers showed up at the dock where we were conducting the port sample just “as a warning,” according to one of the officers. The non-licensed fisher certainly was aware the officers were there, but there was no direct contact made with him by the officers.
This was quite surprising to me, and so I asked one of the officers about it a couple of weeks later when I was conducting a semi-structured interview with him. I asked him why he did not interact with the fisher directly, or, for example, examine his catch. He indicated that without a law that requires all fishers, including recreational fishers, to hold a license, there was nothing he could do in that situation:

*Just because this guy comes in with a bunch of fish and lobster, that doesn’t mean anything. Anyone can go out there and catch a bunch of fish. It’s only when he sells it that it becomes illegal.*

In this case, the officer’s ability to enforce commercial regulations was directly impacted by the lack of recreational regulations.

While I was living in St. Croix, the territory began the process of developing a set of recreational fishing regulations, including a mandatory recreational license and specific bag limits (limits on the number of a particular species of fish allowed to be taken on any one trip by any individual). The same DEE officer quoted above described how this would help the officers’ ability to enforce fishing regulations:

*If that same situation occurred and recreational regs were in place, then I’d have a justifiable reason to ask the guy for his commercial license when I see him come in with a few coolers of fish. Until that’s in place, though, I got nothing.*

Other officers agreed that having a full suite of commercial and recreational regulations will allow the regulations to be more easily enforced across the board.

Additionally, several DEE employees voiced frustration regarding the lack of support from their superiors or the judiciary branch when it comes to fisheries issues. Many described cases in which they had done everything they could to follow through with an arrest on a fisheries regulation charge, only to have the case thrown out by someone in a political position or once the case got to court. As one officer explained:
So I make the arrest and spend an entire couple days doing all the paperwork, writing the reports. Then have to take time out to go to all the court hearings… only to have the judge throw it out on some technicality. And this is what always happens.

After telling a similar story, another officer said:

So that’s why I don’t even waste my time making arrests anymore. I just give citations and keep them in a file. Then, after I get a whole bunch on one guy, I can go to the commissioner and say, “Look—we need to take his license.” But I haven’t done that yet...

It is clear from these statements that the officers feel the implementation of recreational regulations will directly improve their ability to effectively enforce commercial regulations.

Lack of Cooperation Between DFW and DEE

Many DPNR employees also felt there was a lack of cooperation and coordination between DFW and DEE, which directly impacted the agencies’ abilities to effectively perform their legislated management duties. For example, many DFW employees who were interviewed felt that DEE officers either were not aware of the fishing regulations, or, even if they knew what they were, chose not to enforce them because they did not understand the rationale behind them. As one DFW employee stated:

What many of the officers don’t know is that most of these regulations come right from the fishermen. They’re the ones who come to us and tell us what’s going on and what needs to be done about it. So, by not enforcing the regulations, the officers think they’re helping the fishermen, but really they’re not.

Another past DFW employee suggested that increased cooperation between the two divisions could help provide fishers and the public with more consistent information regarding fishing regulations:

It would be great if a fisherman could ask DFW and DEE the same question about a regulation and get the same answer. [Laughs] But that
doesn’t happen. I tried several times to get things to be more coordinated, but with everyone stretched thin on time and money, it just doesn’t happen. How are these guys supposed to know what they can or can’t do when everyone’s telling them something different?

While none of these issues is unique to commercial fisheries management in St. Croix, taken together they create an ineffective, frustrating atmosphere in which workers find it difficult to do their jobs in a manner most conducive to fisheries management. As a result, commercial fisheries management at the territorial level ends up being quite different in practice than it is legislated to be. Without fully-staffed management bodies that have the tools they need to perform their mandated management duties, most infractions are missed or ignored. Moreover, because fishers (both with licenses and without) are aware of the issues summarized above, they know they are able to fish illegally without much risk of being caught.

Effectiveness of St. Croix Fisheries Advisory Committee (FAC)

Another important facet of fisheries management in St. Croix is the Fisheries Advisory Committee (FAC). As described earlier in the chapter, the FAC is made up of up to 14 members from a variety of stakeholder groups (including commercial fishers, marine scientists, dive operators, recreational fishers, and government agencies), and serves as an advisory body to the DPNR Commissioner regarding fishing regulations and management. In addition to taking field notes and making observations at 10 St. Croix FAC meetings, questions about the prescribed role and perceived effectiveness of the FAC were included in semi-structured interviews with all individuals who had any
experience with the committee (e.g., current or past members, current and past DPNR employees).26

The St. Croix FAC is the primary path through which marine resource stakeholders are able to influence local management decisions. With the assistance of a DFW representative acting as an advisor, the FAC is charged with discussing issues relating to fisheries resources and management in St. Croix and the USVI and making recommendations to the DPNR Commissioner. Observations and data from semi-structured interviews with FAC members revealed that several factors prevent the FAC from performing these roles effectively and efficiently.

Commercial Fishers versus Environmentalists

Observation of FAC meetings clearly indicates the polarization and tension that exists between the island’s commercial fishers and the environmentalists on the committee. (The term “environmentalists” used here refers to those on the FAC who tend to favor increasing restrictions on commercial fishing.) Though interview data suggests this “us versus them” mentality has existed between these two groups for many years, it is quite apparent the current tension is still largely linked to events surrounding a gillnet ban and enforcement (which is discussed in more detail in Chapter 7) issue from the mid-2000s. I observed that any topic discussed at FAC meetings relating to the creation of new commercial fishing regulations or alterations to existing ones frequently resulted in loud arguments, with fishers stating their distrust of DFW and the environmentalists, and accusing them of being underhanded and manipulative. In the fishers’ words, “They just

26 Because providing exact quotes and percentages would allow participants to be easily identified due to the small size of the group being discussed (the FAC), I have purposely limited the discussion. This section is included, however, because I feel it describes important aspects of how management is actually carried out on a daily basis.
want to shut us down.” Though others on the FAC often responded in a much more reserved manner, the debate would increasingly become one-sided and dominated by the fishers on the FAC. Frequently, consensus could not be reached on a given topic, and the decision would be made to move on to the next agenda item, though the entire agenda was never discussed at any meeting I observed due to a lack of time.

Lack of “Professional Atmosphere”

Many FAC members described the “unprofessional atmosphere” of the meetings and the lack of members’ “decorum” as a major barrier to the committee’s effectiveness. Reflecting the “professional” business setting social norms commonly shared in the Continental US, the white, non-fisher FAC members described that members arriving late, not turning phones off and answering phone calls during the meetings, yelling, and making personal attacks and accusations were examples of unprofessional behaviors that occurred (and that I observed) frequently. Regarding the yelling and screaming, there were times when FAC members stated they were uncomfortable with and intimidated by others’ behaviors. I too, even as a non-participating observer, sometimes felt threatened, although I was not at all involved in the discussion. Interestingly, this behavior seemed to characterize the fishers’ responses more often than others. Those who were louder and more forceful in their statements and behaviors were commercial fishers, who also were either West Indian or Puerto Rican. Those who were more reserved and who felt uncomfortable by this “loud and unprofessional behavior” were white and had grown up in the continental US. While they deemed this behavior inappropriate and threatening, the fishers felt they were simply being passionate about protecting their livelihoods as fishermen. As an “outsider,” I often found it surprising that they could be screaming at
someone during the meeting, then ask politely about that same individual’s family as soon as the meeting was over. While this did seem to be a case of people from different cultural contexts exhibiting different behaviors they independently consider to be “normal” and “appropriate,” the tensions and issues it created certainly fostered an unproductive and tense atmosphere during FAC meetings. Although none of the participants indicated that they associated these behavioral differences with differences in power, observation at meetings suggests fishers used these behaviors to seek control over the meetings and the decisions that were made.

Role of Politics

Several participants described the political nature of the territorial fisheries management process and a lack of support from the DPNR leadership and other territorial leaders as a barrier to the FAC fulfilling its advisory role effectively. As one participant stated:

*All we can do is make recommendations. But that doesn’t mean anyone has to listen to us. Ultimately, it’s up to the commissioner, senators, governor. If they don’t listen, there’s nothing we can do about it.*

Some participants felt leaders were unresponsive, and simply did not care or pay attention to the FAC’s recommendations. Others felt leaders did take the FAC’s recommendations into consideration, but ultimately decisions were made based on how territorial politicians felt their decisions would be perceived by constituents and what would allow them to be re-elected. Regardless of the underlying reason, participants from all stakeholder groups on the FAC, including commercial fishers and environmentalists, felt governmental leaders simply did not give environmental concerns the attention they
deserve, and instead focused on the economic development of the island, even if it was to the severe detriment of the local environment.

Despite these challenges, FAC advisors and members continue to attend the monthly meetings, battling all the frustrations that accompany them. Most members have been on the committee for at least 10 years, and many have been involved since the FAC’s inception in the early 1980s. When asked why they continue to be members despite all the challenges, many of them responded with some version of the statement, “If I don’t do it, no one will.” Many of them feel that if they were to leave the committee, there would not be anyone to replace them from their stakeholder group. As one individual stated:

I am tired of it. And it’s hard to keep fighting the same battles again and again. But if I leave, who will take my place? No one has the knowledge I have after all these years. And no one else wants to put up with all the trouble and hassle.

Others feel that despite the challenges, they ultimately are doing a good thing:

Yeah it’s hard, and the process is slow, and I’m tired of no one listening to us. But, we have done some really good things. The lobster and conch populations are doing well with the regulations we put in place. And the gill net... even though it took a long time... I think we did something good there.

Although all FAC members who were interviewed voiced similar frustrations, each of them stressed their commitment to the committee and made no mention of intentions to resign their position.

According to all members of the FAC, the issues described above create a frustrating and often ineffective environment in which the FAC functions. Although some members have called into question the appropriateness of others’ behaviors, this is perhaps expected when individuals from different cultures are
concurrent members of an advisory body purposely composed of representatives from different stakeholder groups representing different interests. Despite these differences, members who were interviewed appear committed to the FAC, and the main issue affecting the committee’s effectiveness is the political nature of DPNR and USVI leaders’ willingness to follow the recommendations provided to them.

Results: Findings from Analysis of Grey Literature Regarding the Structure of Federal Fisheries Management

In order to describe federal fisheries management bodies I introduce the regulatory bodies involved and describe how they are legislated to carry out federal fisheries management as it applies to St. Croix. I then describe the main laws, regulations, and federal marine managed areas currently in place to manage federal fisheries. Next, I utilize data collected primarily through semi-structured interviews to describe participants’ perceptions regarding the effectiveness of federal fisheries management. This discussion highlights the ways in which federal management as it is actually carried out diverges from how it is legislated to be carried out.

Federal Management Bodies

The Caribbean Fisheries Management Council (CFMC) is responsible for the management of the marine resources of the EEZ of the USVI and Puerto Rico. The CFMC develops fishery management plans (FMPs) for the region’s important commercial species, which must then be approved by the US Secretary of Commerce. The CMFC is made up of ten members, seven of whom are voting and three non-voting. Of the seven voting members, three are mandatory governmental members (CFMC
2010b). These include the regional NMFS administrator (from NMFS Southeast Regional Office, in this case) and the “principal state official” with “marine fishery management responsibility,” or his or her designee, from Puerto Rico and the USVI. As is common with most of the other regional councils, the territorial government representatives from Puerto Rico and the USVI who attend the meetings and participate as voting members are not the heads of the relevant agencies. In the case of Puerto Rico, the Secretary of the Department of Natural and Environmental Resources (DNER) has designated the DNER Director of the Division of Wildlife to act on his behalf. In the USVI, the Commissioner of DPNR has designated the Director of DFW to act on his behalf. The other four voting members are, as specified by the MSA, “individuals who, by reason of their occupational or other experience, scientific expertise, or training, are knowledgeable regarding the conservation and management, or the commercial or recreational harvest, of the fishery resources” of the US Caribbean. The secretary of commerce appoints these individuals from a list of nominees submitted by the governors of Puerto Rico and the USVI, and they can serve up to three three-year terms (nine years in total). During the time of my fieldwork, of these four voting members, one is from St. Croix, one is from St. Thomas, and two are from Puerto Rico. The three non-voting members are as follows: (1) the Commander of the Seventh Coast Guard District, or designee; (2) the Southeast Regional Director of the US Fish and Wildlife Service, or designee; and (3) a representative from the Office of Marine Conservation, US Department of State, or designee (CFMC 2010b). The Coast Guard almost always sends a representative to the regular CFMC meetings (usually held four times per year), but

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27 MSA, 16 U.S.C. 1852 § 302(b)
28 MSA, 16 U.S.C. 1852 § 302(b)
budgetary constraints have prevented representatives from the other two non-voting groups from attending. Their participation, however, is important because FMPs often have international issues (for example, when having to do with species that migrate outside of US federal waters), as well as considerations of other applicable laws and regulations that are of concern to the Department of Interior and the Department of State. In the case of the Coast Guard, they help design the best management regimes from the point of view of practical enforcement actions or measures. Even when attendance of representatives of these groups is not possible, comments and advice are sent in writing (Rolon, personal communication, September 22, 2010).

In the development and revision of FMPs, the CFMC is advised by fishery scientists both within and external to government agencies, as well as by a variety of advisory groups. For example, the Scientific and Statistical Committee (SSC) is made up of nine marine scientists whose role is “to assist it in the development, collection, evaluation, and peer review of such statistical, biological, economic, social, and other scientific information as is relevant to [the] Council’s development and amendment of any fishery management plan.” The Advisory Panel (AP) also provides advice to the CFMC, but its purpose is slightly different than that of the SSC. The AP is made up of 15 individuals involved in the fishing industries of Puerto Rico and the USVI, and the group provides advice to the CFMC regarding the effects FMPs or amendments have on local economies and social structures, potential conflicts between user groups of a particular resource, or related enforcement issues (CFMC 2010a).

FMPs are usually modified through amendments, and the CFMC develops a set of “alternatives” for each amendment that are presented periodically to the public via

29 MSA, 16 U.S.C. 1852 § 302(g)
“scoping meetings.” At these meetings, CFMC staff and/or NMFS scientists present the alternatives, which are essentially different options for achieving specific management goals. Commercial fishers, other stakeholders, and members of the public can attend these meetings and provide “on the record” testimony as to which alternatives they do or do not support and why. Additionally, written comments can also be submitted during certain time periods, and by law, the CFMC must take public comments into consideration (McCay and Creed 1999). Attending meetings, and submitting comments to the CFMC via public comment at meetings or via written statements are the primary mechanisms put in place by the regional fishery management council system for stakeholders and members of the public to participate in the management process. As such, these are the “formal” modes of participation examined in this dissertation. Once the FMPs and amendments are reviewed and approved by NMFS and the Secretary of Commerce, they are implemented by NMFS and enforced by the Coast Guard.

Federal Fishing Regulations

Currently, the CFMC has FMPs in place for Caribbean spiny lobster, shallow water reef fish (such as various types of snappers and groupers), queen conch, and corals and reef associated plants and invertebrates. The FMPs mainly utilize area and seasonal closures, minimum size restrictions, and gear restrictions to manage the fisheries. In many cases, the regulations for the EEZ of the USVI are the same as for territorial waters, such as the prohibition of harvest or possession of Nassau grouper and goliath grouper. The USVI Commercial and Recreational Fisher’s Information Booklet (DPNR 2010) provides a complete description of current federal fisheries regulations as they apply to the USVI.
Federal Marine Managed Areas

In addition to the marine managed areas described earlier in the chapter which are either managed jointly by federal and territorial agencies or cross jurisdictional boundaries in terms of managed area, there is one additional marine managed area in St. Croix’s EEZ. All fishing is prohibited within the Red Hind Spawning Aggregation Area (Figure 4) from December 1 to February 28 each year. This area is located to the east of St. Croix on Lang Bank, and is approximately 3.9 square kilometers (1.51 square miles) in size (DPNR 2005b).

Results: Findings from Semi-Structured Interviews Regarding Legislation versus Observed Practice of Federal Fisheries Management

As discussed earlier in this chapter, in order to understand the extent to which fishers participate in the management process, it is important to document the current structure and practice of fisheries management in St. Croix. Building upon the previous section, I utilize data gathered through semi-structured interviews to describe the “on-the-ground” reality of federal fisheries management in St. Croix. This allows for a comparison between how federal fisheries management is supposed to be carried out based on laws, regulations, and agency mandates, and how it actually occurs. Additionally, the challenges federal managers face as they perform their prescribed roles are highlighted. Because federal management in St. Croix is conducted primarily by only one regulatory body (CFMC), the data presented in this section are organized by theme.
Lack of Data

One of the biggest challenges impacting federal fisheries management in St. Croix (and the US Caribbean in general) is the lack of fisheries data that is available to inform management decisions. Although commercial fisheries landings data have been collected since 1975 in St. Croix, there are many limitations of the data. One problem is that the catch data have not been reported for individual species, and have only been reported for species groups or families (e.g., snappers, groupers, parrotfish). For many of the stock assessments and analyses NMFS and CFMC scientists would like to perform, this resolution is not fine enough. Additionally, data is often missing, incomplete, or the parameters not consistent enough over time to allow for comparison across years (SEDAR 2009). It is also common knowledge among commercial fishers, fisheries managers, and other marine resource stakeholders in St. Croix that the data provided by fishers in their commercial catch reports is not very accurate or reliable. Although commercial fishers are legally required to turn in their catch reports on a monthly basis, this regulation is not enforced. Fishers often turn them in to DFW on a much less frequent basis, or turn in all 12-months’ worth of catch reports when they go to renew their commercial license in July each year, admittedly filling out the forms based on what they usually catch right before renewing their license. While several fishers suggest this reflects forgetfulness or their inability to understand why reporting their catch is important, members of other stakeholder groups (such as dive shop owners and local marine scientists) believe commercial fishers purposefully report inaccurate catch levels in order to reduce potential fishery closures. Regardless of the reasons for misreporting
or inaccuracies in the data, the result is a dataset that is used in certain cases by managers because it is the best available data, but it is widely questioned by all.

The lack of consistent and reliable data causes individuals from certain stakeholder groups to refrain from participating in federal fisheries management in St. Croix. As a result, some interests are represented more strongly than others in the CFMC and management process. For example, several ENGO stakeholder group interview participants indicated that they purposefully refrained from being involved because without sound data, they believed management decisions were made based on politics instead of science. As one individual stated:

* I go to the meetings sometimes so that I know what’s going on, but as a representative of ______, I can’t make any formal statements or be that involved. We can help make decisions when the data’s there, but without it, it’s just political. We can’t be a part of that. 

A thorough discussion of the extent to which and in what manner fishers and other stakeholders participate in the management process is included in Chapter 8. What is important to note here is that without representation on the CFMC and participation from a variety of extractive users (such as commercial fishers) and non-extractive users (such as members of ENGOs), the federal fisheries management process in St. Croix is not the “shining example of true, participatory democracy” (NMFS and Councils 2003:23) it is claimed to be. Data gathered through informal and semi-structured interviews with CFMC meeting attendees who have also attended fishery management council meetings in other NMFS regions suggest that the lack of variety in stakeholder group public participation at meetings and representation on the CFMC is one way the CFMC differs from other councils.
Lack of Data Contributes to Inappropriate Management Measures for US Caribbean

In the absence of reliable, species-specific data, the CFMC have opted to utilize management mechanisms that do not necessarily require knowing species’ populations or exact levels of catch, such as seasonal closures. However, reflecting the centralized nature of US federal fisheries management, sometimes Congress mandates all regional fishery management councils (including the CFMC) to use specific management tools, such as in the recent case of annual catch limits (ACLs). An ACL is the amount of fish allowed to be caught in a year, and the 2006 amendments to the MSA require their implementation in order to reduce overfishing in the nation’s fisheries (CFMC 2010c).

As one NMFS administrator who works closely with the CFMC stated:

> So it’s really challenging for us. Congress says we have to use the ACLs, and that’s it. We don’t have a choice. But, if we don’t have the data, how can we come up with ACLs? They may work in other regions, like New England or Alaska, but they’re a big distraction from what we need to do here.

This statement shows that Congress may pass mandates that must be followed by all regional fisheries management councils, even though the elements needed to properly implement them (such as reliable, species-specific data) are not available to be used. As a result, the CFMC and NMFS must spend time and resources trying to gather the best information they can and developing ways to implement the management tools they are mandated by Congress to use, instead of focusing on management strategies that are the most appropriate for St. Croix (and the US Caribbean overall). This is a clear example of the mismatch between the federal fishery management system and the small-scale nature of St. Croix’s fishery.
Constant Turnover of USVI Representatives

As discussed earlier in the chapter, the political nature of many of the upper-level, appointed USVI DPNR positions means there is a great deal of turnover in who represents the USVI as the voting member on the CFMC. Due to the MSA, the principal state official with marine fishery management responsibility in the USVI (the DPNR Commissioner) may appoint a designee to be the USVI representative. Often this is the Director of DFW, which was the case during my fieldwork. However, as described earlier, the high rate of turnover in this position (usually every four years, coinciding with territorial governor terms), means the USVI voting member on the CFMC also changes frequently. One CFMC member described how this results in a lack of leadership from the USVI in CFMC activities:

“There’s so much turnover that there’s not a lot of leadership, not a strong voice weighing in. Fishermen and the [USVI] governor complain about how NMFS calls all the shots, but without a strong voice from them, that’s the only way anything gets done. But how can they have a strong leader if those positions are constantly changing?”

Moreover, because the USVI voting member of the CFMC is often an appointed DFW position, there may be variation in his/her level of knowledge regarding fisheries management, disparities in the management goals being put forth, and inconsistencies in the extent to which his/her participation and voting in influenced by politics.

Lack of Federal Influence Over Management Outcomes

Another factor that influences how federal fisheries management is carried out in St. Croix is the lack of influence the CFMC and federal management have over management outcomes in St. Croix. This is due to a lack of separation between territorial and federal fisheries. Fishers often fish for the same species in both territorial and federal
waters on any given trip, landings data are not accurately separated according to
jurisdiction, and important habitat areas (such as coral reef) are found in both territorial
and federal waters as are the fish (CFMC 2005). For these reasons, in order for
management to be effective, the USVI must implement in territorial waters compatible
regulations to those implemented in federal waters. While they often do, without
effective and consistent enforcement (already identified as an issue and described earlier
in the chapter), the regulations are little more than words on paper. As one CFMC
member explained:

Most of the fishing occurs in territorial waters. The CFMC doesn’t
control enough of the resource to be effective... and without enforcement,
it doesn’t really matter what’s on the books.

Other CFMC members interviewed also expressed similar sentiments, indicating their
frustration with the fact that the effectiveness of regulations and other management
strategies implemented in federal waters is highly dependent upon the actions of
territorial managers.

These data suggest that federal fisheries management as it actually occurs in St.
Croix is quite different from how it is legislated to be conducted. While none of the
issues highlighted are unique to fisheries management in St. Croix, taken together, they
create a management atmosphere in which the line between territorial and federal
jurisdictions is highly blurred. Territorial management agency research and enforcement
activities are almost completely dependent on federal funding, yet the political nature of
DPNR positions and the frequent turnover of key agency positions means they are not
even able to secure and utilize the small amount of funding available to them.
Additionally, because most of the fishing for commercial species over which the CFMC

has control (described earlier in the chapter) is believed to occur in territorial waters, the effectiveness of federal regulations is limited and highly dependent on the implementation of compatible regulations by territorial managers as well as enforcement.

In addition, these data also indicate that fisheries management in St. Croix is not only influenced by DPNR and the CFMC actions and decisions. In some instances, as with the ACLs, the CFMC must follow Congressional mandates that require they take management actions that are more appropriate for the fisheries in other US regions. This study highlights that in order to understand management as it occurs at the local level, we must consider the multi-level management structures within which regulatory decisions are made, as well as the motivations behind decisions made across levels.

Chapter Summary

The data presented in this chapter describe the events and scientific theories that guided the development of the US federal fisheries management system and provides context for fisheries management as it exists today. Because this development was based largely on bioeconomic models, the “tragedy of the commons” theory, and the needs of large-scale, industrialized fisheries, the federal fisheries management system (to which St. Croix is subject) is not well-suited to handle small-scale fisheries management challenges. The ethnographic data presented here also show that there are several limitations in the ability of territorial and federal bodies to manage the island’s fishery effectively, and as a result, the actual day-to-day reality of management as it occurs in the local context differs from how it is legislated. Additionally, the data suggest the blurring between territorial and federal management scales that occurs is a result of the lack of territorial agencies’ resources and capacity, local political agendas, and a centralized management system which mandates the use of regulations better-suited for
industrialized fisheries. I will return to these points in subsequent chapters in which I examine how fishers and other stakeholders navigate this complex, multi-scale management environment.
CHAPTER 6

UNDERSTANDING THE IMPORTANCE OF FISHING IN ST. CROIX

Chapter Overview

Building upon the information presented in Chapters 4 and 5 regarding the historical and contemporary conditions of Crucian society and commercial fisheries management, this chapter describes the long-term connections between the island’s residents, the practice of fishing, and fish consumption. These data are directly applicable to my first research question regarding the social, economic, and historical role of fishing in St. Croix. Building on insights from political ecology, I will describe why it is important to examine patterns of historical resource use in order to better understand contemporary fisheries management conditions. I then describe the island’s long-term connection to fishing by presenting data collected through archival research. Utilizing data collected through surveys, first-hand accounts from the grey literature, and census documentation of commercial fishers in St. Croix from the past, I emphasize the similarities and differences in the fishery characteristics at different points in time as well as make connections between the findings of the previous surveys and current issues being faced by the island’s commercial fishers. Data collected through informal interviews with an elder fisher help provide context for St. Croix’s fishery in the mid-1930s. The information presented here provides context for the following chapter, which describes the current condition of the island’s environment and commercial fisheries, and
allows for a better understanding of the connections between historical and current patterns of resource use and management.

**Why Are Historical Fisheries Data Relevant?**

Including a discussion of the history of fishing in St. Croix and the role it played throughout the development of the island is absolutely critical if we are to fully understand the connection of contemporary Crucian society to the activity socially, culturally, and economically. Just as Chapter 4 described why and how historical events and social relationships based on ethnicity and social class may influence current relationships and interactions between individuals and social groups involved in fisheries management, this chapter presents data that is directly relevant to the current importance of fish and fishing to Crucian society as well as to commercial fishers’ identities. As anthropologists have long argued (Acheson 1981; McCay and Acheson 1987; McCay and Jentoft 1998; Ostrom, et al. 2002), considering this kind of social and cultural data is important if we are to understand why fishers’ and fishing communities’ behaviors do not reflect only economic concerns and the maximizing of economic benefits. I will describe the role of fishing throughout St. Croix’s history, building upon Valdes-Pizzini et al.’s (2010) recent work which characterizes the Crucian experience relative to the larger Caribbean region.

Additionally, including historical data has the potential to assist the National Marine Fisheries Service’s (NMFS) movement toward an ecosystem approach to fisheries management. As described in Chapter 5, this approach views humans as an integral component of the marine ecosystem, and one of the goals is to allow for the continued sustainable use of marine resources by humans. In order to achieve this goal and to understand where humans fit into the larger ecosystem, however, we must
examine the long-term and historical contexts that emphasize the relationships of individual and communities with fishing activities. As political ecology research has shown, critically examining the content and source of historical data in this manner can allow for an understanding of why certain groups may have more control over resource use and management today (Stonich 1998; Zimmerer 2000). Additionally, political ecologists frequently examine historical patterns of resource use and practices in order to untangle the existing politics of uneven resource distribution (Robbins 2004).

Understanding how this occurred in the past is critical to a better analysis of what is going on currently.

**Results: Findings from Archival Research Regarding the History of Fishing in St. Croix Prior to US Purchase in 1917**

St. Croix has a long history of fishing-related activities. Evidence suggests that the first groups to inhabit the island, the Arawaks and Caribs, were skilled seafarers and fishers. They found ways to adapt their river and coastal canoes into vessels capable of navigating the open seas between the Caribbean islands. They used shellfish, crustaceans, and reef and pelagic fish to supplement their diet of fruit, vegetables, and land animals (Highfield 1995; Valdes-Pizzini, et al. 2010). The Arawaks and Caribs likely fished with nets made of fibers that were weighted down with stones, dragging them along the sea bottom close to shore. Hooks were made out of bone and shells, and spears were often decorated with fish bones. Spears were used to hunt manatees, monk seals, and sea turtles (Dookhan 1994).

Valdes-Pizzini et al. (2010) describe the sharing of knowledge of fishing gears and techniques that occurred with the mixing of people and cultures as St. Croix evolved.
from a relatively homogenous indigenous society into the colonial plantation economy. European, African, and indigenous (Arawak and Carib) fishing practices were combined and adapted to the local conditions and fishing continued to be a common and important activity. As the sugar plantation economy developed in St. Croix in the 1700s, fishing played a critical, yet often unmentioned role in the lives of slaves. Price (1966) describes the “fishing slaves” of the Caribbean islands, who fished to provide food for their masters and who occupied a slightly more privileged position than other slaves who worked in the fields. They were granted more freedoms as well, since their role required they go off alone or in pairs to fish, and Price suggests that “a unique and self-perpetuating fishing subculture sprang up within the plantation system” (1966:1371). Although this article is based on the accounts of French visitors to the islands of Jamaica, St. Lucia, Martinique, Les Saintes, and Dominica during the 1600s and 1700s, and does not specifically mention St. Croix, because of the similarities between the Crucian plantation economy at that time and those of the aforementioned islands of the Lesser Antilles, it is somewhat reasonable to assume the information presented could apply to slaves in St. Croix. Additionally, Lawaetz (1991) describes instances in which slaves were able to use the money they earned by selling fish at the local market to ultimately buy their freedom.

Interestingly, despite the seemingly unlimited fish and other marine species available to early Crucians in the surrounding waters, the main source of fish for slaves was “saltfish,” which was usually salted cod, and sometimes smoked and marinated sardines and herring (Dookhan 1994; Valdes-Pizzini, et al. 2010; Willocks 1995). These fish were imported from the North Atlantic and represent a link to the emerging global economy. After the abolishment of slavery, saltfish continued to be one of the staple
foods provided to plantation laborers as part of the food allowance they were entitled to as part of their wages (Jensen 1998). Kurlansky (1998) describes how the European obsession with cod shaped the market structure in Spain, Portugal, England, Holland, and France, which then reproduced this high reliance on salted fish for consumption throughout their Caribbean and American colonies (Valdes-Pizzini, et al. 2010). St. Croix was no exception and each of the commercial fisheries surveys that will be described mention the large-scale importation of fish, a trend that continues today.

Additional information regarding fishing practices and seafood consumption during the colonial period prior to the United States (US) purchase of the islands in 1917 comes from historical accounts that describe life in St. Croix at the time, as well as from drawings and sketches produced during the time period. Several of these accounts were written in the 1700s and 1800s by Danish and European individuals who were owners or employees of the plantations, school teachers, or otherwise part of the white upper class. Many of them describe the important role fishing played in the lives of slaves who worked in the fields or in other areas of plantation life. Although the living conditions were generally very poor and the work extremely hard, many slaves were allowed to cultivate small plots of land near their living quarters. Slaves generally had Sundays off from their plantation work, and so could participate in other activities to earn a small amount of income, such as fishing, rearing livestock, or hiring themselves out as laborers (Lawaetz 1991; Schmidt and Holsoe 1998 [1788]). They then sold all of these commodities (fish, livestock, produce) at the market on Sunday. The money they earned could then be used to buy anything not provided by their masters (clothing and medical care was typically provided), or saved to buy their freedom (Dookhan 1994). For slaves
who were fortunate to gain their freedom, whether as a gift from their masters or through their own purchase, those who were skilled fishers were able to enter the market economy not as commodities, but as producers of commodities (Valdes-Pizzini, et al. 2010).

These accounts also describe the fishing practices used by the slaves, such as this account, written by Johan Christian Schmidt, a Danish surgeon employed by one of the wealthy and powerful plantation families in St. Croix in the 1770s and 1780s:

In fishing they have many unusual and ingenious tricks. Some use large baskets, some small lines and harpoons. Some fish in the following manner: they take the bark of a tree which the English call Dogwood, and fill some small bags with it. They dive deep into the water with it and stir it around rapidly. What happens then is that the fish become drowsy and dazed, either by taste or by the smell, and then float to the surface of the water, so that the Negroes can grab them with their hands. (1998 [1788]:25)

Reimert Haagensen (Haagensen and Highfield 1995[1758]), a Danish plantation owner in St. Croix, also described this practice of using Dogwood bark to stun the fish, stating how “the slaves can quite easily gather them by hand while they are still alive and string them together on a line. In this way, they catch hundreds of fish of various kinds” (63). The use of plant material to stun or confuse fish is a common practice throughout the world.

Additionally, Haagensen describes how the slaves caught lobsters:

Lobsters are available in abundance, but they have to be caught at night. Armed with a bright torch called a ‘flamboy’ slaves go down to the beach at night and, walking along with this torch, can pick the lobsters up with their hands. This is easily done because the lobsters stay among the large rocks near the beach (Haagensen and Highfield 1995[1758]:64).

These accounts not only describe the fishing methods used by the slaves, but also indicate that fish and lobsters were so abundant they were easily caught by hand.
Moreover, accounts also indicate that the white settlers also ate many types of fish and other sea creatures. Both Haagensen (Haagensen and Highfield 1995[1758]) and Schackinger (as cited in Mudie 2005) describe how sea turtles were abundant, and that turtle meat and turtle eggs were considered a delicacy. Wealthy beach-front property owners in Christiansted often constructed weirs or pens along the shoreline where they kept fish and turtles alive, so that they always had a supply of fresh seafood. Haagensen also describes how

> the people get an abundance of many kinds of fish from the surrounding sea. They all have their particular names and are delicate and good to eat, comparable in most ways to the perch, pike and cod of the waters here [in Denmark] (Haagensen and Highfield 1995[1758]:63).

Johan David Schackinger, a Danish schoolmaster who lived in St. Croix from 1857-1863, mentions more of the specific types of fish consumed:

> The ocean has a large abundance of fish, some edible, others poisonous. Of the edible ones I shall only mention ‘king fish,’ hog fish, grouper, pew fish, barracuda, Spanish mackerel, cavallo, flying fish, seafish, sea devil, oldwife, trunk fish, porcupine, parrot fish, and sprats; also we find lots of sharks, besides lobsters and sea and land crabs (Mudie 2005:29).

Additionally, most accounts mention the large abundance of land crabs, which all classes of people liked to eat. Haagensen (Haagensen and Highfield 1995[1758]) describes how they were so abundant at certain times of the year that “the sandy beaches look quite red instead of white, and people can scarcely walk or ride on them” (64). Moreover, because the land crabs were rare and hardly seen on St. Thomas or St. John, many people in St. Croix sent barrels of them as gifts to their friends on the other islands (Haagensen and Highfield 1995[1758]). These accounts are particularly interesting because they indicate the large variety of fish and sea creatures consumed by all Crucians—slaves, European settlers, West Indians from other islands, the wealthy and the poor. Interestingly, most
white Continentals living in St. Croix today see it as inappropriate to consume many of the creatures mentioned, including reef fish such as parrotfish and trunk fish, and participant observation and informal interview data indicate that many look down upon the Puerto Rican, blacks, and West Indians who do so.

Additionally, accounts and drawings from the 1800s begin to indicate the growing importance of the fish market. Henry Morton, a reverend from Philadelphia, visited the Danish West Indies in 1834, producing a series of sketches, paintings, and diary entries, which were published by the Danish West Indian Historical Society in 1975. Two of the drawings depict the main fish markets of St. Croix, one in Christiansted and one in Frederiksted. Valdes-Pizzini et al. (2010) describe Morton’s drawing of Protestant Bay in Christiansted (Figure 5):

… he offers a panoramic view of Protestant Bay in Christiansted which shows the prominent feature of the fort (nowadays a monument of the National Park Service), with the fish market to the right (to the east) of the fort. The scene presents five soldiers marching with bayonets, a man on a horse, and two women vendors, a boat and the shack of the fish market. Military power, the planter class, and the local population are represented in this painting, in which the local people are shown through the occupation of coastal lands, and by fishing, represented by the West Indian archetype of the women vendors. The fish market was, according to various sources, at the epicenter of the coastal communities surrounding the fort, and was a key element in the small urban development of Christiansted. Saturday, as stated by Morton in his own caption of the sketch, was the market day for fishing, as it still is today (59).

Morton also sketched the Frederiksted fish market (Figure 6). He describes the fish market as “Bargaining place, social club and town meeting rolled into one, the fish market was the center of village life each morning when the sound of the conch shell horn signaled that the boats were bringing in the catch” (Selskab and St. Croix Landmarks Society 1975:86). Additionally, in a diary entry, Morton writes:
Figure 5. Protestant Bay in Christiansted with fish market. Drawing by Henry Morton (From Selskab and St. Croix Landmarks Society 1975).

Figure 6. Frederiksted fish market. Drawing by Henry Morton (From Selskab and St. Croix Landmarks Society 1975).
Fish are plentiful and fine—Groupers, Greenlies, Grinders and Greybacks in abundance. Angels less numerous. Doctors, Welshmen, Snappers. High crowned Ladies—Hedge hogs—Devil fish, Butter fish and Snappers—flap about in the bottom of every boat that lands and by their variety of colours and oddness of shape give great life to the Fish Market (Selskab and St. Croix Landmarks Society 1975:172).

In addition to fishing and selling their catch at the market or by peddling door to door, freed slaves and other mixed, non-white Europeans often settled in the urban areas—Christiansted and Frederiksted—where they engaged in a variety of other economic endeavors, including dock work, piracy, boat construction, privateering, and assisting in all aspects of commerce and trade. This type of occupational multiplicity became an important and common characteristic of many Caribbean coastal communities (Comitas 1962; Stoffle and Stoffle 2007; Stoffle, et al. 2009; Valdes-Pizzini, et al. 2010), and Valdes-Pizzini, et al (2010) describe how “the diversity of occupations made them more resilient to boom and bust processes, and changes in the key economic activities that tend to dominate the rural landscape, such as the production of agricultural commodities for the world market” (7). This strategy is still found among Crucian commercial fishers today as well as in other island communities throughout the Caribbean.

These early historical accounts indicate that fishing has been important to St. Croix’s residents for hundreds (if not thousands) of years. Fishing practices changed throughout the 20th century as the mixing of peoples and cultures occurred throughout the Caribbean. Additionally, fishing became extremely important to slaves, as it provided more freedoms to those who were fortunate enough to be “fishing slaves” as opposed to working in plantation fields. Fishing skills were likely highly-prized, as these practices also operated as a way for slaves to earn extra money which they could use to buy their
freedom. Then, once free, these skills enabled them to enter colonial society as producers of foods that were important to Crucian society, as opposed to continuing to be commodities themselves. Interview data suggest that commercial fishers today play a similar role in Crucian society. Several fishers stressed that they choose to fish for a livelihood because they could do so without having to work for anyone else, and because they could provide important resources to island residents. Just as fishing provided a way for fishers to earn money outside of the mainstream, white European-controlled plantation economy during the colonial period, fishing today provides a way for fishers to earn a living outside of the mainstream, Continental-controlled tourism and manufacturing industries. Additionally, the practice of holding multiple jobs—fishing as well as others—is another aspect of fishers’ practices described in the colonial period that continues today.

The descriptions of the abundance of fish are important because in the absence of catch records, these are the only evidence we have for understanding what fish population levels were like at that time and to get a sense of long-term patterns in abundance. These descriptions also provide evidence that the species consumed by the island’s white population have changed over time. Many of the species mentioned in these accounts written by white Europeans and described as being eaten—such as parrotfish, oldwife, and trunk fish—are rarely consumed by whites today. While they are still consumed by non-white residents, these reef fish species are generally viewed by whites as fish that should not be caught and which should remain on the reefs for recreational purposes (for snorkelers and divers to admire them). The fish market was also introduced as being important in colonial times, which is also something that continues into present day. The
next sections utilize reports resulting from United States Virgin Islands (USVI) commercial fishing surveys and censuses conducted at various points throughout the 20th century.

**Analysis of Grey Literature: Results of 1917 Commercial Fisheries Census**

The first official census of USVI commercial fisheries was undertaken just after the US purchased the islands in 1917. For the purposes of the census, the “commercial fishery” included “all fishing operations conducted for profit, but [did] not include the operations of individuals or clubs catching fish for their own consumption or for sport” (Bureau of the Census 1918:141). According to this census, there were 103 individuals employed as fishers in St. Croix, all of whom were “colored” and spoke English exclusively, as opposed to the white “Frenchies” primarily from St. Barts who accounted for most of the fishers in St. Thomas. Additionally, there were 119 individuals in St. Croix classified as proprietors, or fishers that owned a boat and received a share of the catch for the boat. It is unclear whether all the proprietors were “colored” as well. This report classified the commercial fishing as “shore fishing,” in that all fishing was carried on from shore or from boats of less than 5 tons, mainly sailboats and rowboats. Gears used included set pots (fish pots), seines, hand lines, turtle nets, and cast nets, but the report indicates that pots were the primary gear used. Interestingly, there were approximately three times as many pots reported in St. Croix (907) than in St. Thomas (295), a situation that has definitely reversed in recent years.

The 1917 census report indicates that officials encountered at that time many of the same problems fisheries officials encounter today when gathering fisheries data. For example, they found it very difficult to obtain reliable information from fishers regarding

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30 For the 1917 USVI census, “colored” referred to all individuals who were not white.
the amount of fish caught or the amount of money received from fish sales, as “in no instance were records kept” (Bureau of the Census 1918:142). Additionally, it was common for several fishers to fish from one boat, but sell their shares of the catch separately, which further complicated obtaining reliable information. The report also describes the commercial fishery of the USVI as quite different from most in the continental US:

It was impossible to separate the quantities of fish caught by any given apparatus, as in many cases set pots, seines, and hand lines were all used by fishermen, who had no idea as to the amount caught by each; this also applies to the showing of the catch by species, as all kinds of fish sell at practically the same price. These conditions are unlike those in the United States, where there are many operators who use certain apparatus for catching certain species and are, therefore, able to give fairly accurate figures as to the various kinds caught and the method of capture (Bureau of the Census 1918:142).

Because of these difficulties, most of the statistics included in the 1917 census report were based on estimates obtained from fishers and proprietors directly. It was estimated that 52 percent of the total dockside value of the territory’s fishery was landed in St. Croix, totaling $23,059. Most of the catch was landed in either Christiansted or Frederiksted, both of which had established fish markets where the fishers or vendors—usually women—would sell the catch. Fish was sold “by the strap,” and not by weight. A “strap” was a piece of tough grass or fiber, used to string several fish together. A strap varied from 1-2 pounds, and varied in price depending on the time of day. Due to the lack of refrigeration, a strap’s market value varied between 10 to 18 cents before noon, but dropped to five to ten cents in the afternoon. Fish was usually sold in the town markets, but some fishers peddled their catch from house to house. The main fish caught as indicated in the 1917 census report are listed in Table 3.
The report indicates that small numbers of crabs, oysters, and clams were caught, but not in commercial quantities. In addition, a small number of conchs were caught, but their commercial value was linked to their shells being used for souvenirs rather than as food. Table 4 below, taken directly from the 1917 census report, summarizes some of the main characteristics of the USVI fisheries at that time.

The 1917 Census report (Bureau of the Census 1918) does not provide much analyses or interpretation of the fisheries data it presents, nor does it provide contextual information about the island at the time. However, the information it provides does allow one to look for patterns between the fisheries then and now. Several aspects of the fisheries described in the report are similar to those aspects today. For example, in 1917, all the fishers from St. Croix were non-white ("colored"), a trend that continues today and is likely a carry-over from the colonial period discussed earlier in the chapter. The report also shows that many of the fish caught in 1917 are similar to those caught today, or at least of the same fish families. Additionally, the report describes USVI fisheries as different from those in the mainland US at the time, due to the multi-gear, multi-species

Table 3. Main fish caught by commercial fishers according to the Bureau of the Census (1918).

<table>
<thead>
<tr>
<th>Barracuda</th>
<th>Grouper</th>
<th>Mullet</th>
<th>Rockfish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bluefish</td>
<td>Grunt/Margate</td>
<td>Oldwife</td>
<td>Shell or Trunk fish</td>
</tr>
<tr>
<td>Bonito</td>
<td>Hogfish</td>
<td>Porges</td>
<td>Yellowtail</td>
</tr>
<tr>
<td>Cravelle</td>
<td>Jackfish</td>
<td>Redfish</td>
<td>Spiny Lobster</td>
</tr>
<tr>
<td>Doctorfish</td>
<td>Kingfish</td>
<td>Red Snapper</td>
<td>Turtles</td>
</tr>
<tr>
<td>Goatfish</td>
<td>Mackerel</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
nature of the fisheries. This is important to note because even though this point was made almost 100 years ago, the fisheries of the USVI continue to be managed by the US in much the same way as the large-scale, single-species, single-gear fisheries in the mainland. The writers of this era also indicated they had difficulties collecting fisheries data for several reasons, including the fact that fishers did not keep records, multiple fishers often fished from one boat, and due to the multi-gear nature of the fisheries, the

Table 4. Fisheries statistics for the USVI in 1917. Taken directly from Bureau of the Census (1918:145).

<table>
<thead>
<tr>
<th>Item</th>
<th>Total</th>
<th>St. Crof.</th>
<th>St. John</th>
<th>St. Thomas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persons engaged</td>
<td>390</td>
<td>222</td>
<td>34</td>
<td>124</td>
</tr>
<tr>
<td>Proprietors and firm members</td>
<td>212</td>
<td>119</td>
<td>8</td>
<td>85</td>
</tr>
<tr>
<td>Wage earners (average number)</td>
<td>108</td>
<td>103</td>
<td>29</td>
<td>39</td>
</tr>
<tr>
<td>Wages, total</td>
<td>$12,940</td>
<td>$7,771</td>
<td>$3,178</td>
<td>$1,991</td>
</tr>
<tr>
<td>Capital invested, total</td>
<td>$11,002</td>
<td>$6,186</td>
<td>$301</td>
<td>$5,823</td>
</tr>
<tr>
<td>Boats engaged—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number, total</td>
<td>294</td>
<td>98</td>
<td>11</td>
<td>95</td>
</tr>
<tr>
<td>Value, total</td>
<td>$6,692</td>
<td>$3,586</td>
<td>$420</td>
<td>$2,664</td>
</tr>
<tr>
<td>Sailboats—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>28</td>
<td>18</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Value</td>
<td>$2,053</td>
<td>$1,390</td>
<td>$175</td>
<td>$1,143</td>
</tr>
<tr>
<td>Row boats—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>176</td>
<td>80</td>
<td>9</td>
<td>87</td>
</tr>
<tr>
<td>Value</td>
<td>$4,097</td>
<td>$2,021</td>
<td>$345</td>
<td>$1,741</td>
</tr>
<tr>
<td>Apparatus—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Value, total</td>
<td>$4,612</td>
<td>$2,812</td>
<td>$571</td>
<td>$929</td>
</tr>
<tr>
<td>Set pots—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>1,293</td>
<td>937</td>
<td>61</td>
<td>295</td>
</tr>
<tr>
<td>Value</td>
<td>$2,120</td>
<td>$1,575</td>
<td>$64</td>
<td>$497</td>
</tr>
<tr>
<td>Cast nets—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>44</td>
<td>40</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Value</td>
<td>$376</td>
<td>$291</td>
<td></td>
<td>$35</td>
</tr>
<tr>
<td>Seines—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>21</td>
<td>9</td>
<td>6</td>
<td>11</td>
</tr>
<tr>
<td>Value</td>
<td>$1,552</td>
<td>$322</td>
<td>$440</td>
<td>$280</td>
</tr>
<tr>
<td>Lines—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>150</td>
<td>58</td>
<td>13</td>
<td>78</td>
</tr>
<tr>
<td>Value</td>
<td>$395</td>
<td>$147</td>
<td>$5</td>
<td>$43</td>
</tr>
<tr>
<td>Tangle nets—</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>69</td>
<td>23</td>
<td>31</td>
<td>12</td>
</tr>
<tr>
<td>Value</td>
<td>$139</td>
<td>$57</td>
<td>$72</td>
<td>$24</td>
</tr>
<tr>
<td>Total catch for year:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pounds</td>
<td>590,057</td>
<td>233,575</td>
<td>168,815</td>
<td>181,667</td>
</tr>
<tr>
<td>Value</td>
<td>$44,435</td>
<td>$23,050</td>
<td>$5,183</td>
<td>$10,191</td>
</tr>
</tbody>
</table>
amount of catch resulting from the use of a particular gear could not be separated out. All of these issues continue to plague fisheries data collection efforts in St. Croix today.

**Analysis of Grey Literature: Results of 1932 Bureau of Fisheries Report**

Following President Hoover’s visit to the USVI in 1931, which led him to declare the islands the “effective poorhouse” of the US, the US Bureau of Fisheries was charged with analyzing the economic potential of the USVI fisheries as part of an initiative to alleviate the islands’ poor economic conditions (Fiedler and Jarvis 1932). In 1930, the population of the USVI was approximately 22,000, and Fielder and Jarvis found fishing provided a livelihood for about two percent of the population. They interviewed about 85 percent of the territory’s 405 full- and part-time fishers (200 of which were in St. Croix), and found that 88 percent of the fishers were “colored” and 22 percent were white (with whites still primarily located in St. Thomas). There were no Hispanic fishers reported at that time (a fact which becomes more significant in later discussions in the dissertation). They found that in 1930, USVI fishers caught approximately 616,000 pounds of fishery products, valued at about $49,000. 259,000 pounds were landed in St. Croix, totaling about $29,800. These figures were estimated, as the interviewers again indicated that the fishers did not keep any records of their operations. They estimated that about 40 percent of the islands’ total catch was made by set pots (fish pots, see below for description; today, these are usually called “traps”), 30 percent by seines\(^{31}\), and 30 percent by lines (such as hand lines), hand (such as diving for lobster), or other kinds of gear.

The 1932 report (Fiedler and Jarvis) is the first to describe in detail the fishing boats and gears used in the USVI, with reference to the differences between St. Croix, St.

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\(^{31}\) Seine fishing is a method of fishing using a fishing net (deployed from a boat or in shallow water) with the bottom edge held down by weights and the top edge suspended by floats at the water's surface. The ends of the net are brought together horizontally to capture fish.
Thomas, and St. John. Similarly to the 1917 census, Fiedler and Jarvis found the main types of boats used for fishing throughout the USVI were small, crudely built sailboats and rowboats (about 15 to 20 feet in length), unfit for rough seas or long trips. In St. Croix, the main type of boat used was a “bateaux” or flat-bottom skiff, as opposed to a type of canoe that was mainly used in St. Thomas. None of the boats had wells for holding live fish, and less than half of the fishers owned a boat.

The most widely used type of fishing gear throughout the USVI were set pots. There were a total of 934 pots used by St. Croix’s fishers in 1930, almost double the number used by St. Thomas’s and St. John’s fishers combined. Fiedler and Jarvis describe a pot as “a boxlike structure made in the shape of a broad arrowhead from mats of split withes, woven with an openwork hexagonal mesh, and braced with a framework of small poles of green wood” (1932:8). They indicated that in St. Croix, the fishers usually made the pots out of 1/8-inch diameter drawn wire, which they acquired from marine cable, and one- to two-inch mesh. Pots were usually fished in waters 12 to 60 feet deep, and a single boat usually fished 4 to 30 pots. Pots were fished baited with crushed lobster, whelk, or conch meats, or were not baited at all.

Tangle nets, a type of gill net, were also used, primarily to catch turtles (Fiedler and Jarvis 1932). These nets were fished as drift nets or as sunken nets, usually with a wooden turtle decoy tangled in the net to attract the turtles. Haul seines were used to catch schools of fish along sand or gravel beaches, cast nets were used to catch bait, and trawl lines were sometimes used in water 60- to 360-feet deep, left set out overnight. Although Fiedler and Jarvis (1932) do not label the USVI fishery as “multi-method,” they nonetheless describe it as such. For example, in reference to handlines, they state that
“almost every boat carries one or more of these lines, which are used for bottom fishing” (Fiedler and Jarvis 1932:13), implying they are available for use any time fishers want to fish in this manner. Additionally, they describe the use of troll lines: “This type of fishing is known locally as ‘towing’ and is carried on only when making the trip to and from the grounds where set pots or trawl lines are fished” (Fiedler and Jarvis 1932:13). Similar practices continue today, as Crucian fishers will often use troll lines as they are traveling to the locations where they conduct other forms of fishing.

Table 5 shows the fish and shellfish taken in USVI waters as identified by Fiedler and Jarvis (1932). This list is much more specific than that provided by the 1917 census report (Bureau of the Census 1918) and allows us to see specific species of fish (such as dog snapper) captured by fishers as opposed to only the general fish families (snappers). While the list does not provide information regarding how much of these species were caught, or whether certain species were targeted (and caught) more than others, it is not much different from what fishers catch today; a mixture of reef (such as grunts and parrotfish) and pelagic (such as tuna and dolphin) species, baitfish (such as “fry”), and lobster and conch. However, two of the species in the list—Nassau grouper and “Jewfish” (goliath grouper)—are now considered illegal because of regulations implemented due to overfishing. It is not surprising to see these two species on the list of fish captured by fishers in the early 1930s, however.

Fiedler and Jarvis (1932) found that of the 200 fishers on St. Croix, the majority lived in either Christiansted or Frederiksted, and held no other occupations. Those who
Table 5. List of fish and shellfish taken by commercial fishers in the USVI in 1932, as identified by Fiedler and Jarvis (1932).

<table>
<thead>
<tr>
<th>Taken by trolling lines:</th>
<th>Dolphin</th>
<th>Snook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ocean gar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cutlass gar</td>
<td>Bonefish</td>
<td>Tarpon</td>
</tr>
<tr>
<td>Kingfish/King Mackerel</td>
<td>Tuna</td>
<td>Bonito</td>
</tr>
<tr>
<td>Spanish Mackerel</td>
<td>Barracuda</td>
<td>Amberfish</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Taken by nets:</th>
<th>Mullet</th>
<th>Moonfish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carang, or crevalle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hogmouth fry</td>
<td>Goggle-eye jack</td>
<td>Silverfish</td>
</tr>
<tr>
<td>Grubber broadhead</td>
<td>Horse-eye jack</td>
<td>Leather jack</td>
</tr>
<tr>
<td>Sparkhead fry</td>
<td>Bumper</td>
<td>Yellow jack</td>
</tr>
<tr>
<td>Sweet fry</td>
<td>Yellowtail</td>
<td>Weakfish</td>
</tr>
<tr>
<td>Striped anchovy</td>
<td>Black grunt</td>
<td>Corbina</td>
</tr>
<tr>
<td>Whitebill</td>
<td>White grunt</td>
<td>Schoolmaster</td>
</tr>
<tr>
<td>Chub</td>
<td>Bonito</td>
<td>Ballahoo</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Taken by set pots:</th>
<th>Red hind</th>
<th>Doctorfish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dog snapper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red snapper</td>
<td>Rock hind</td>
<td>Trunkfish</td>
</tr>
<tr>
<td>Gray snapper</td>
<td>Spotted hind</td>
<td>Angelfish</td>
</tr>
<tr>
<td>Lane snapper</td>
<td>Margate</td>
<td>Blue parrotfish</td>
</tr>
<tr>
<td>Mangrove snapper</td>
<td>Oldwife</td>
<td>Green parrotfish</td>
</tr>
<tr>
<td>Mahogany snapper</td>
<td>Hogfish</td>
<td>Red parrotfish</td>
</tr>
<tr>
<td>Silk snapper</td>
<td>Suckingfish</td>
<td>Harvestfish</td>
</tr>
<tr>
<td>Black grouper</td>
<td>Black grunt</td>
<td>Spadefish</td>
</tr>
<tr>
<td>Nassau grouper</td>
<td>Common grunt</td>
<td>Muttonfish</td>
</tr>
<tr>
<td>Red grouper</td>
<td>Striped grunt</td>
<td>Catalufa</td>
</tr>
<tr>
<td>Red goatfish</td>
<td>Yellow grunt</td>
<td>Squirrelfish</td>
</tr>
<tr>
<td>Yellow goatfish</td>
<td>Sailors Choice</td>
<td>Cowfish</td>
</tr>
<tr>
<td>Ten-pounder</td>
<td>Jewfish²</td>
<td>Niggerfish²</td>
</tr>
<tr>
<td>Graxs porgy</td>
<td>Round robin</td>
<td>Rock beauty</td>
</tr>
<tr>
<td>Jolthead porgy</td>
<td>Rock salmon</td>
<td>Spiny lobster</td>
</tr>
</tbody>
</table>

| Taken by hand:                                        | Oysters | Spiny lobster| Whelks |
|------------------------------------------------------|---------|-------------|
| Conchs                                               |         |             |
| Oysters                                              |         |             |

³² These were the common names used during this time period, which often reflected ethnocentric and racist perspectives. It appears that “Niggerfish” is actually what is now commonly called by Crucians “butterfish,” *Cephalopholis fulva*, but it is not clear when the common name changed. “Jewfish” was the common name used for goliath grouper, *Epinephelus itajara*, until 2001 when the American Fisheries Society began encouraging the use of a more culturally sensitive name.
lived outside of the two major towns tended to use fishing as part-time work, in addition
to doing other jobs. Fiedler and Jarvis also recognized the difference in the amount of
fishing grounds available to the fishers of St. Croix, as opposed to those of St. Thomas
and St. John. They report, “While the possible fishing ground around the island of St.
Croix is not as great as that of the other islands in the group, this area is fished more
intensively” (Fiedler and Jarvis 1932:15). They describe the steep drop in depth that
occurs within one-quarter to one-half mile off the shore around most of the island, and
that most of the fishing occurs around the eastern end of the island. They felt the fishing
grounds in St. Croix were fished more intensively because the fishing boats were larger,
more gear is carried on board, and the boats fish a greater portion of the available area
(Fiedler and Jarvis 1932).

Fiedler and Jarvis (1932) also described the marketing of fish, and described the
Christiansted and Frederiksted fish markets as in much better condition than those on the
other islands. They were located on the shoreline, and although there was no running
water supplied, “the market is kept quite clean and is free from flies” (Fiedler and Jarvis
1932:18). Interestingly, Fiedler and Jarvis indicate that fish was no longer sold “by the
strap” in St. Croix, and instead was sold by the weight. Regulations against street
peddling were enforced, and fish was sold either at the markets or from boats at the
wharf. It was customary at the time for a conch shell to be blown when a fishing boat
was landing, announcing the arrival of fish for sale (see Figure 7). Fish sold in the
markets was usually sold by “market women,” who retained 15 cents for every dollar’s
worth sold. Fish was sold at a fixed price, depending generally on the size: the smallest
fish, “frying or breakfast fish,” was sold at 10 cents per pound; larger fish or “boiling
“fish” was sold at 12 center per pound; and “baking fish” was sold at 14 cents per pound. They also indicate that all fish caught around St. Croix was sold locally, and none was sent to other islands. A small part of the catch, if not sold fresh, was salted and sold in areas outside of the towns for about 10 cents per pound. Fiedler and Jarvis (1932) also found that the annual per capita consumption of seafood in the islands was about 32 pounds, or about three-fifths of a pound of fish per week, which was double the amount
consumed in the continental US at that time. In order to supplement the amount of fish caught locally and continuing the culture of consuming salted fish, approximately 300,000 pounds of edible fishery products were imported in 1930, consisting mainly of salted and smoked groundfish and herring. Most of these imports came from the US mainland.

Fiedler and Jarvis (1932) also briefly mention regulations that were in place at the time, including the prohibition of the capture of “immature fish,” female turtles in certain seasons, and female lobsters with eggs. Additionally, although fishers and fishing gear were not licensed, a $1 fee was assessed for each keeled boat. Flat-bottomed boats were not assessed this fee, which is why they were favored in St. Croix. They do not mention how or why these regulations came to be in place, but further research into this point is warranted. It would be valuable to know if these regulations were developed by the fishers themselves, which could indicate cooperative relationships among fishers to the benefit of the fisheries and their livelihoods.

According to Fiedler and Jarvis (1932) the purpose of the 1932 investigation was to make recommendations regarding how USVI fisheries could be improved or developed so as to help alleviate the poor economic conditions of the islands. Although they felt the shallow waters of Lang Bank, an area to the northeast of the island, could serve as potential new fishing grounds for Crucian fishers and that the catch could be increased by as much as 50 percent, they did not recommend any increase in fishing effort or exploitation. They found that:

the fisheries of the Virgin Islands of the United States are faced with the problem of marketing the catch now obtained rather than that of securing a sufficient supply… improvements are needed in methods of handling and
marketing rather than the further development of means of capture (Fiedler and Jarvis 1932:26).

Firstly, because boats did not have live wells and ice was not used to keep the fish cold, fish less than 24 hours was already decomposed when sold. Fish not sold the same day was often thrown out, which was an economic waste. They recommended that the investment be made by fishers to keep the fish on ice, and that cold storage facilities be developed for keeping fish frozen for longer periods of time. Their second main recommendation was the development of a local fish-curing industry. Remarking on the large quantities of cured fish products that were consumed locally, they stated,

> The popularity of these products may be attributed to the fact that they are of dependable quality and are accustomed articles of diet, well known through use since the first settlement of the Virgin Islands in the seventeenth century. It is believed that certain species of fish caught locally in some abundance would be suitable for curing, and if properly prepared could replace imported cured fishery products, thus making the population more dependent upon local fish, and at the same time promoting home industry (Fiedler and Jarvis 1932:27).

Although these recommendations were made, there is no evidence of efforts to follow them and the importation of salt fish from North America continued.

Again, several characteristics of the commercial fisheries at that time are similar to those today, and it is important to take note of this. The fishers continued to be primarily non-white (with the white fishers located in St. Thomas), all of the catch was sold locally, the boats used were small and rudimentary, and the fishery continued to be multi-method.

**Analysis of Grey Literature: Fishing in the Mid-1900s**

Following the 1932 Fiedler and Jarvis report, there were no official censuses or studies of USVI fishermen for many years. Several reports from the 1940s and 1950s do discuss the status of commercial fisheries in the Caribbean in general, mentioning many
of the same points discussed by Fiedler and Jarvis (1932), and primarily focusing on how they could be further developed. Howard (1950) suggests this interest in expanding the region’s fisheries stemmed from the food shortages experienced during World War II, which led to decreased imports into the region from European and North American markets and concerns about food security. As a result, governments such as the US and England, and global organizations such as the United Nations Food and Agriculture Organization (FAO), focused on evaluating Caribbean island fisheries for increased production. Although Howard (1950) recognizes that Caribbean waters are not as productive as those of more temperate regions and mentions certain species dropping in abundance in specific locations, he still suggests Caribbean fisheries can be expanded. He believed the offshore waters offered great prospects for future development of pelagic fisheries, but suggests the need for more advanced fishing technology (such as larger boats with motors) for those to be exploited. Both Howard (1950) and Idyll et al. (1950) suggest that local governments should be willing to provide financial assistance in the form of loans or credits to fishers to allow for the purchase of more advanced gear and equipment. They also suggest the importance of hiring and training local fishers to help teach other fishers how to use the new gears and technologies as well as to collect basic fisheries catch data, keenly aware of the lack of influence an outsider “expert” or scientist has once they leave the island. Lastly, aware of the problems most Caribbean fishers were experiencing associated with preserving fresh fish, Idyll et al. (1950) echo Fiedler and Jarvis’s (1932) recommendations for the increased use of ice and the development of local fish curing and salting facilities. Interestingly, these reports indicate that Crucian fisheries and fishers were facing several of the same challenges as those of other
Caribbean islands post-World War II and post-colonialism as they struggled to become more self-sustaining.

The Cultural Importance of Fish and “de Market”

Most of what we know about fishing practices and the role fishing played in St. Croix’s local culture and economy from the 1930s to the 1960s is derived from interviews and first-hand accounts. These accounts describe the important role fish played in the Crucian diet, and the cultural role of the fish market (Lawaetz 1991; Schrader 1996, 1989; Williams 2004). Fish was eaten at all times of day and in a variety of ways. Certain dishes, such as kallaloo and fungi, had Western African culinary roots, and were regular parts of the Crucian diet. Fresh fish was added to the recipes or eaten as a complement to these dishes, and if fresh fish was not available, then saltfish (either that made from locally caught fish or imported saltfish bought from local shops) was used as a replacement. Stewed lobster and stewed conch were also popular dishes, though they were not eaten to the same extent as fish (Williams 2004).

The fish market was a popular place in both Frederiksted and Christiansted, and from firsthand accounts it seems the two locations developed different traditions. In Frederiksted, the main fishing days were Tuesdays, Thursdays, and Saturdays. According to one Frederiksted resident describing the fish market in the 1930s, Jack fish were sold mostly on Saturdays and went for ten cents per pound. When the conch shell blew at 6 or 7 p.m. it meant there were still unsold jacks reduced to five cents per pound. It was not unusual to see folks frying jacks past midnight on Saturday to place in a cowitch sauce for Sunday’s breakfast and served with johnny cakes or Johnny Scraper’s titi bread and cocoa tea (Williams 2004:81).
In Christiansted, the main fishing days were Wednesdays and Saturdays. In “The Neighborhoods of Christiansted” (Thurland 2009), Lenore Hendricks Finch, a long-time St. Croix resident, remembers going to the fish market in the 1940s:

Another fun time for me was on Saturday mornings. It seems like we had fish on Saturdays and Wednesdays. I loved the adventure of going to the Fish Market with my mother. Mommy would wait for the boats to come in with their catch. Mommy and the other women had to sweet talk Miss Vertie Martin to get a boil fish or fry fish. I was fascinated by the noise made by the women, especially when they heard the conch shells blowing announcing the arrival of the fishing boats. While the fishermen were emptying their catch on the concrete tables, the haggling would get louder and the women more frantic to get the fish they wanted (134).

Realizing the rich and unique information about St. Croix that would be lost as individuals pass on, writer and St. Croix native Richard Schrader, Sr. has written and published a series of prose and poetry books describing Crucian life and culture. In “Notes of a Crucian Son” (1989), Schrader describes his experiences as a boy in the 1940s, waiting on the shoreline for the fishers to return with the day’s catch:

I marveled at the boatloads of shiny, glass-eyed fish as they flapped their tails against each other desperately, albeit unsuccessfully, trying to return to their watery home. And there they were, stacked like sardines in a can: old wife, doctor fish, shellfish, goat fish, horse fish, angel fish, bluefish, congo (eel), wenchman, yellowtail, grouper, snapper, puppy shark, and more. Sometimes there were also lobsters, pan crabs, and conch.

We often roasted doctor fish, shellfish, and lobster right there at the bayside, using sea water for seasoning and sauce. Fish, conch, and lobster were plentiful and cost between fifteen and twenty-five cents per pound. Brata (giving a little over the amount of goods purchased) has long been a local custom. Extra fish, lobster, and conch were often given away freely to customers (41).

This quote highlights the great diversity in the fish caught during that time period.

Additionally, the fact that fish, lobster, and conch were often given to customers for free
implies that these species were plentiful enough fishers could do so without being impacted financially.

Additionally, the fish market was where much of the fishing gear was handmade. “Fish pots, seines, buoys, nets, boats, oars, almost everything which was needed was made at the fish market area. Men seemed to delight and take great pride in the fishing trade at that time” (Williams 2004:12).

Results of Informal Interviews with Elder Fishers: Personal Histories of Fishing Practices

The scene from the fish market described above is quite different from today, and one rarely sees fishers building or working on their gear at the market. Instead, fishers usually build pots or repair their gear and boats at home.

Although many of the fishermen from the 1940s and 1950s have either passed on or moved away from St. Croix, I was able to conduct several informal interviews with eighty-five-year-old long-time fisher Oscar McGregor. He did not want to plan a time for me to interview him more formally, and so I had to take advantage of opportunities when I ran into him by chance to speak with him informally. There is also a brief biographical sketch of McGregor included in Richard Schrader, Sr.’s 2009 book, “Teach a Man to Fish and Other Stories,” and there is a great deal of overlap between what is in the book and what McGregor told me during our conversations about his early fishing experiences. He described Gallows Bay (a small fishing village close to Christiansted) as his home, and reminisced how when he was growing up in the 1930s and 1940s, every fisher had his own spot where he kept his gear and boat, and it was safe enough for them to leave their equipment there when they were not fishing or working on their gear. He
also described how fishers would sit on the shoreline of the bay, building traps, repairing nets, and caulking wooden boats. Though Gallows Bay as a fishing village has changed a great deal over the past few decades due to the forces of gentrification and the displacement of fishers throughout the island (Stoffle, et al. 2009; Valdes-Pizzini, et al. 2010), McGregor can still often be found sitting on the shoreline at the bay building or repairing traps. Although he does not fish much anymore, other fishers still hire him to build fish traps.

McGregor also played an important role in the creation of a market for lobster, as the demand increased with a burgeoning tourism industry in the late 1940s. As tourism became an important industry for St. Croix, so did lobster become important to the fishery, especially after the Buccaneer Hotel opened in 1947 (Bucaneer Hotel 2010). As recorded in Schrader (2009), McGregor indicated to me in our informal interviews that at that time, he had over 500 traps in St. Croix’s waters and recalls catching up to 700 to 800 pounds of lobsters a day. He alone supplied most of the island’s hotels with lobsters, which sold for about 25 cents per pound (Schrader 2009). Thurland (2009) describes how fishers would cook the lobster at the market, then deliver them to the resorts. As a direct result of this increase in tourism, lobster went from being the “brata” or the bait to being a main marketable item.

These first-hand accounts and descriptions of Crucian commercial fishing and the fish market in the mid-1900s indicate the strong connection the island’s residents have with marine resources as a source of food, income, social connection, and cultural identity. In the absence of any formal commercial fisheries surveys, the examination of
these data provides information that is critical to understanding the fisheries of this time period.

**Analysis of Grey Literature: Results of 1968 Survey of USVI Commercial Fishermen**

The next scientific survey of the USVI commercial fishery was conducted in 1968 in cooperation with the Virgin Islands Ecological Research Station, which was affiliated with the College of the Virgin Islands. Although the data included in this report are not reported broken down by district (with St. Croix and St. Thomas/St. John reported separately), it still gives a general sense of what was going on in the fishery and with the fishers at the time. Swingle et al. (1970) surveyed 69 percent of the full-time fishers and 25 percent of the part-time fishers in the territory. As with the 1917 (Bureau of the Census 1918) and 1932 (Fiedler and Jarvis) investigations, they encountered difficulties in determining catch levels, total value of seafood products caught, and percent of catch caught by gear type because the majority of fishers did not keep any records (only one fisher interviewed had records). Therefore, many of the statistics reported by fishers were estimates. Additionally, they attributed the trouble in obtaining accurate catch statistics to “the absence of any organized distribution system for the fishery [cooperatives or commercial distributors], coupled with the lack of licensing or registration requirements for fishermen or their gear” (Swingle, et al. 1970:110).

Swingle et al. (1970) found that although the total population of the USVI had increased from 22,012 people in 1930 (when Fiedler and Jarvis conducted their survey) to about 55,000 in 1967, the total number of fishers in the territory remained the same (about 400). This indicated a 60 percent decrease in fishers relative to the entire
population. Additionally, they found that about half (56.3 percent) of the local commercial fishers were native US Virgin Islanders, which indicated that the percentage of native-born commercial fishers in the entire population had decreased by about two-thirds during the 38 year period between surveys (Swingle, et al. 1970). Although the authors do not state the cause for this change, in light of the large number of Puerto Rican and West Indian immigrants who entered the territory during that 38 year period (as described in Chapter 4), it is reasonable to assume that their immigration may have been a contributing factor. Swingle et al. (1970) also reported that the average commercial fisher was about 45 years old and had been fishing for 19 years. They felt this was an indication that commercial fishing is attracting fewer of the younger generation, and attributed this to the increase in employment opportunities in tourism and related businesses, local government, and industrial enterprises.

As reported in the previous surveys, the boats used in the USVI commercial fishery continued to be small (14 to 20 feet) and built locally by the fishers. Most boats throughout the territory had outboard gasoline engines of less than 20 horsepower, though 21 percent of the fishing vessels in St. Croix had inboard power (compared with less than 7 percent of fishing boats in St. Thomas and St. John that were inboard powered). Interestingly, Swingle et al. (1970) comment, “The difference is that many of the St. Croix vessels are large, venturing up to 100 miles to catch and sell seafood” (114). Further investigation through both archival research and semi-structured interviews failed to produce additional evidence of this point, however. Even commercial fishers who were active in the late 1960s and early 1970s did not know this to be true, indicating very few vessels ventured further than the 40 miles from St. Croix to St. Thomas and St. John.
In 1968, set pots (at this point in time, commonly referred to as “fish pots” or “fish traps”) continued to be the most common type of fishing gear used by USVI fishers. Although Swingle et al. (1970) do not report the total number of pots used in the USVI, they do report the total number of pots fished by the 153 USVI commercial fishers they interviewed. The total number of pots used by the 72 fishers they interviewed in St. Croix was 443, with an additional 425 lobster pots being reported as well. The Swingle et al. (1970) report is the first time “lobster pots” are mentioned, so it is difficult to determine if both types of pots were included in the 934 “set pots” Fiedler and Jarvis reported in 1932, or if the “lobster pots” were a new type of pot added to the fishery. The 60 fishers interviewed by Swingle et al. in 1970 from St. Thomas reported using a total of 340 fish pots and no lobster pots. As for other fishing gears used, Swingle et al. reported that the nets used in the USVI were primarily haul seines, which were set near a beach and then hauled ashore. They reported that no gill nets or purse seines were in use in 1968, and that a small modified tangle net was sometimes used to catch turtles. Additionally, Swingle et al. (1970), like Fiedler and Jarvis (1932), describe the multi-method nature of the USVI fishery, stating, “Many fishermen use hook and line techniques in conjunction with other gear, but very few use this method of fishing exclusively” (112).

Swingle et al. (1970) reported that the St. Thomas fishers hauled their pots more often and caught more fish per man than the fishers of St. Croix and St. John. They report that Crucian fishers caught an average of 6.6 pounds of fish each time they hauled a pot, totaling about 4,770 pounds of fish per year per fisher. This was lower than St. Thomas, which had 8.7 pounds per pot per haul and 9,520 pounds per year per fisher.
The authors concluded that fishing in St. Croix was “only fair,” and pinpointed the effects of the dredging of the Harvey Alumina and Hess Oil industrial areas on the south shore as one of the causes. They state that the dredging had reduced the amount of quality fishing grounds on the south shore of St. Croix, and that, “Numerous reports from scientists have indicated it may be as long as 40 years before the effects of these dredging operations subside completely” (Swingle, et al. 1970:115). These sentiments were being echoed elsewhere by the early 1970s, with scientists, local naturalists, and residents describing the development of the industrial complex on the south side of the island as the crucial loss of the largest mangrove, wetland, and fish nursery area on the island (DPNR 2005b; Goenaga and Boulon 1992; IRF 1993; Seaman 1974).

Swingle et al. (1970) do not list the specific types of fish landed by USVI commercial fishers, but do separate out landings of lobster, conch, turtle, and a few others (Table 6). Fiedler and Jarvis (1932) reported the total annual landings in 1930 were about 616,000 pounds valued at $49,000. According to Swingle et al., by 1968 the total annual landings had increased 150 percent to 1.5 million pounds, and the value had increased 1500 percent to $782,000. Marketing of fish in 1968 had changed little from that reported in 1930, though the average price per pound of fish had increased to 50 cents. Fish were generally sold whole and unclean, and were rarely kept on ice, so sanitation and preservation continued to be an issue. Interestingly, Swingle et al. (1970) do not mention much about the fish market. While previous reports (Bureau of the Census 1918; Fiedler and Jarvis 1932) described the fish market as an outlet through which fishers could sell their fish in an organized manner and with the help of women vendors (despite the poor sanitary conditions), Swingle et al. focus on the lack of more
formal marketing structures, such as fishermen’s cooperatives or commercial distributors. It is unclear whether this absence indicates a decrease in the use of the markets by fishers to sell their fish between the 1950s and 1970, or if it reflects the perspective of the researchers.

Despite the increase in total landings, the local demand for seafood continued to be greater than that supplied by local fishers, and in 1968 over 1.5 million pounds of fish and seafood was imported into the USVI (Swingle, et al. 1970). Main imports included salted and smoked fish from foreign countries, kingfish from Puerto Rico and the US mainland, and shrimp and crab from a variety of locations.

Based on their research, Swingle et al. (1970) recommended that rigorous development of the USVI fishery was needed in order to meet the demand for local seafood products. However, they reiterated the sentiments of earlier reports that this could only be done “if proper attention is given to upgrading the present techniques, more
modern fishery techniques [such as trawling, purse seining, or longlining\textsuperscript{33}] are utilized, conservation practices followed and adequate government services and a good marketing system established” (120). They recommended the enactment of “enforceable legislation providing for the regulation and protection of the fishery resources” (120), along with the appointment of officers to enforce the legislation, inspect catches, and maintain fisheries statistics. Moreover, they felt that because the total USVI catch had increased since 1930, but the number of fishers had stayed the same, the fishery stocks were not being overfished. Therefore, they recommended increases in bottom fishing, research into making the widely-used fish traps more effective, expanding seine fishing, and the adoption of using gill nets to catch schools of jacks, mackerels, and oceanic tunas.

Despite the continued recommendations throughout the mid-1900s to expand and advance USVI and Caribbean fisheries technologically (Fiedler and Jarvis 1932; Howard 1950; Idyll, et al. 1950; Swingle, et al. 1970), little was done toward this end in St. Croix. In his 1972 Commercial Fisheries Review article, Willard Brownell (then affiliated with the Caribbean Research Institute) described some of the issues with developing more extensive commercial fisheries in the northeastern Caribbean. He reported that throughout the 1960s and early 1970s, several efforts were made by various groups, such as the Puerto Rico Department of Agriculture, the UNDP/FAO Caribbean Fishery Development Project, NMFS, and the Japanese fishing operation based in St. Martin, to locate exploitable stocks of fish. Brownell (1972) reports these efforts were fruitless,

\textsuperscript{33} Trawling is a method of fishing that involves pulling a net through the water behind a boat(s). Purse seining is a method of fishing using a seine net (see footnote 31) with a line that passes through a series of rings attached along the bottom of the net. When this line is pulled, the bottom of the net closes, preventing fish from escaping out the bottom. Longlining is a fishing method in which one main line is used, with baited hooks attached at intervals along the line. This line is then set at either the surface of the water or on the bottom.
primarily because of the lack of plankton productivity in this region when compared with the productive fishing grounds throughout the world, such as the northern Atlantic. Plankton productivity in the Caribbean is limited by the lack of nutrients in the waters due to sparse runoff, lack of upwelling, and unfavorable currents that carry nutrients out of the region (Hargraves, et al. 1970). Brownell describes that this lack of productivity is intensified in the USVI by human-induced factors, such as pollution from dredging, municipal sewage, garbage dumping, and oil spills, which by that time had become persistent problems in the territory. He describes,

The reclamation of shallow bays and mangrove forests for residential, resort, and industrial development poses an ever-increasing threat to the fisheries. These protected areas, so important as nursery and feeding grounds for fish and shellfish, are methodically being destroyed in the Virgin Islands by man-induced siltation and filling (Brownell 1972:23).

Additionally, Brownell describes how most modern high-yield fishing methods, such as purse seining, trawling, or longlining, could not be used in the USVI due to dispersed fish populations and undesirable bottom habitats such as coral beds and steep slopes.

Brownell (1972) concludes that in order to succeed economically, the USVI fishing industry would have to be diversified, and larger boats would have to be used in order to reach the more productive areas that are further away from the islands. However, he states,

Since the local government offers virtually no assistance for improving boats, equipment, methods, and handling techniques, the native fishermen cannot take advantage of these grounds’ potential. At the same time, considerably larger boats with more sophisticated gear would tear up their nets (and the bottom) and would not make large-enough catches to justify the initial investment (Brownell 1972:28-29).

While he feels that USVI fisheries could be further developed and the catches increased without depleting the resources, he does note the importance of “proper management”
(though he does not indicate what that may be), and of government support and financing. In addition to Brownell’s comments, others have suggested reasons for the lack of USVI fisheries development, including the belief that fishery resources were already being depleted, the lack of willingness among fishers to utilize new or different methods, and the tendency for the local government to emphasize the economic improvement of the island solely through the development of oil refining and other manufacturing industries (Brownell and Rainey 1971; Olsen and LaPlace 1981; Valdes-Pizzini, et al. 2010).

The reports by Swingle, et al. (1970) and Brownell (1972) are particularly informative because they allow for the examination of connections between what was happening in the USVI fisheries at the time and the larger context. The older age of fishers was likely a result of the large-scale development of the tourism and manufacturing industries that occurred in St. Croix in the late 1960s. They also link a drastic reduction in quality fishing grounds in St. Croix and lower fish pot catch rates than that of St. Thomas fishers to that large-scale development (specifically the dredging on the south shore of the island for the industrial areas). Moreover, Brownell’s (1972) report places the lack of development in USVI commercial fisheries in perspective with the ecological limitations of Caribbean waters. Despite the recommendations from researchers to expand USVI fisheries and to develop them in-line with the large-scale, single-species, modern-gear fisheries toward which many US mainland fisheries were striving, USVI fishers continued their small-scale, multi-method, multi-species strategies—the result of both ecological (low productivity of Caribbean waters) and socio-economic (lack of capital, support, and financing) limitations.
Discussion: Situating Present Practices in Historical Perspective

A critical examination of these historical reports and other accounts is important to this dissertation because it allows greater insight into the events and conditions that contributed to the current state of fisheries management in St. Croix and the challenges that impact management effectiveness today. Interestingly, many of the problems and issues in the fishery that Fiedler and Jarvis (1932) and Swingle et al. (1970) describe are similar to those one finds today. For example, Swingle et al. state, “The fishery is composed of many individual efforts and there is little intercommunication; fishermen are seldom acquainted with the overall fishery, with persons or techniques in the other islands or with fisheries in other sections of their own island” (1970:110). As will be discussed in Chapter 9, this lack of cohesiveness among Crucian fishers continues to exist today. Additionally, both reports discuss the lack of modern handling techniques, and the need to provide commercial fishers with a clean and sanitary market, as well as the means to keep their catches refrigerated. This continued to be a challenge during my tenure in St. Croix.

In their report, Swingle et al. (1970) concluded it was unlikely that the fishers’ handling practices (lack of ice) would change, because they were able to sell their catch “without the additional effort of expense involved in further processing or preservation” (113). Swingle et al. also found there was an apparent disinterest on the fishers’ part to employ modern techniques, as well as a lack of investments available to implement them, either from the fishers themselves or the local government. They reported,

Modern practices which could be utilized with relatively small capital outlay are often difficult- or impossible- to put into practice due to a local tendency to resist changes, lack of or difficulty in obtaining specialized gear and the government’s apparent lack of interest in improving the fishery (Swingle, et al. 1970:116).
This lack of interest on the part of the government was mentioned by many of the fishers Swingle et al. interviewed, and the majority of them felt that some kind of government assistance would be desirable. Fishers felt the government could help them by providing loans, developing better marketing facilities, and the development of a government-operated cooperative, as had been developed in Puerto Rico at the time. Again, I found this concern to be echoed by the fishers with whom I interacted, many of whom suggested the territorial government could help them by assisting in the establishment of a fishermen’s cooperative.

Another point touched upon by Swingle et al. (1970) dealt with the loss of gear due to theft or due to damage from large vessels. In regards to the theft of gear, Swingle et al. conclude that “until better government enforcement is available, little can be done” (117). This continues to be a common conclusion drawn by officials and researchers looking into the theft of fishing gear or the theft of fish caught when individuals haul and empty pots owned by someone else. Regarding the loss of gear due to large vessels cutting or fouling buoy lines, Swingle et al. wrote,

In St. Croix, this was a real problem for many fishermen. Some St. Croix fishermen requested action which would alter navigation routes of the Harvey-Hess vessels for this reason. These large tankers and freighters also seemed to take varying routes, and fishermen were hard put to find fishing areas over 5 fathoms in depth where the large vessels did not travel (1970:116).

Again, this issue continues to plague Crucian pot fishers today, and participant observation I conducted on commercial fishing trips (n = 15) indicated these large commercial vessels continue to travel dangerously (and illegally) close to shore, trap fishing grounds, and scuba diving commercial fishers.
Chapter Summary

In this chapter, I first presented an overview of the history of fishing practices based on archival research, the analysis of other grey literature, and informal interviews with an elder fisher to describe the long-term connections between the island’s residents, fishing practices, and fish consumption. These data indicate fishing has played an important economic and sociocultural role for the island’s non-white residents throughout history (and continues to do so). Although the fish market is consistently described as an important element of Crucian society, the data suggest that a formal fishers’ organization or cooperative has never existed. Additionally, despite the early descriptions of USVI fisheries as being different from those of the mainland (due to its small-scale, multi-species, multi-method nature) and the fishery’s lack of infrastructure and government support, reports throughout the 1900s largely promote the development of “modern” and “industrialized” fisheries modeled after those in the mainland. These developments never occurred however, and although some aspects of the fishery have changed (such as the implementation of new fishing technologies or changes in the species targeted), many of the basic characteristics remain the same. This in-depth examination of historical fishing practices and patterns of resource use provides insight into contemporary fishery characteristics and conditions, which is the topic of the next chapter.
CHAPTER 7
RESULTS: ENVIRONMENTAL PERSPECTIVES AND CURRENT FISHERY STATUS IN USVI

Chapter Overview

In this chapter, I present data collected through archival research of reports and other grey literature regarding the biophysical environment of St. Croix, the status of stocks of commercially-fished species, and the most recent census of St. Croix’s commercial fishers in order to establish the context in which fisheries management decisions during my fieldwork were made. Additionally, I describe two main regulatory actions which were the topic of many meetings and conversations throughout my fieldwork: the ban of gill and trammel nets in territorial waters and the implementation of annual catch limits (ACLs). Just as it is important to examine historical data regarding resource use patterns in order to better understand current patterns and conditions, it is also important to understand the ecological trends and scientific data that impact management decisions. Included in this discussion is a more detailed description of the limitations of the data that are available to managers (as mentioned in Chapter 5), and the challenges these limitations present for federal fisheries management. I then use data collected through semi-structured interviews with a variety of stakeholders (fishers, dive-shop owners, environmental organization leaders; analyses of semi-structured interviews was described in the methods chapter) to describe the different perspectives of fishers and non-fishers in St. Croix regarding the use of marine resources and coral reef degradation.
An understanding of all these data is necessary to answer my third research question regarding how fisheries management decisions are made.

**Biophysical Environment Description**

The United States Virgin Islands (USVI) lie in the subtropic Caribbean, approximately 90 miles east of Puerto Rico (Figure 8). The island group is comprised of three main islands—St. Thomas, St. John, and St. Croix—and about fifty islets and cays, totaling approximately 133 square miles. The three main islands have over 172 miles of coastline (DPNR 2005b). St. Thomas and St. John lie on the Puerto Rico Bank, which extends from western Puerto Rico to eastern Anegada in the British Virgin Islands. St. Croix is the largest of the USVI, with a total land area of 83 square miles, and lies about 40 miles to the south of St. Thomas and St. John. The USVI are part of the Caribbean island group known as the Lesser Antilles, which includes the USVI, the British Virgin Islands, Antigua, Barbados, Grenada, Guadeloupe, Martinique, St. Lucia, St. Maarten/St. Martin, and Trinidad-Tobago (among many others). These islands form an arch that extends from Puerto Rico to the northeast of South America and the north of Venezuela (Figure 9). The USVI are part of the Virgin archipelago, a submerged oceanic bank approximately 100 miles long and ranging between 30 and 38 miles wide that curves northward from the eastern side of Puerto Rico (Dookhan 1994).

The USVI lie to the south of the Puerto Rico Trench, which is the deepest part of the Atlantic Ocean, with depths exceeding 8,400 meters. St. Croix lies on a separate shelf from St. Thomas and St. John, with the Virgin Island basin located between them, reaching depths more than 4,100 meters (DPNR 2005b). The wider and deeper shelf of St. Thomas and St. John allows them to be a major center for large freight vessels and a main cruise ship destination.
Additionally, St. Thomas and St. John have deep bays with narrow entrances, which allow them to be safe, protective harbors during rough seas and high winds. St. Croix, on the other hand, has shallower, wider bays that are open to rough weather and less protective for ships (Valdes-Pizzini, et al. 2010).

Due to differences in geological formation, St. Thomas and St. John feature steep mountainous and hilly...
slopes with only a small amount of land suitable for agriculture or urban and residential development. Although all the islands’ soils are quite porous, making them generally unsuitable for agriculture (due to low water-holding capacity and high levels of erosion), St. Croix has a large, flat coastal plain with productive soils in the central part of the island, which allow for some farming and livestock rearing (Dookhan 1994; Valdes-Pizzini, et al. 2010).

The USVI have a mild subtropical climate, due to their location in the belt of the northeast trade winds. High temperatures usually reach 95°F during the summer months, while low temperatures in the winter months may drop to around 65°F, with small seasonal variations. The average annual rainfall is 41 inches per year, and the rainy season runs from September to November (Valdes-Pizzini, et al. 2010). There is, however, a significant amount of variation in rainfall, which contributes to water conservation concerns because there is no naturally occurring fresh water on the islands (Dookhan 1994). The USVI are also frequently affected by Caribbean hurricanes, and at least 12 major hurricanes and tropical storms have passed over or near the USVI in the past 50 years. Even when the islands are only indirectly affected by these storms, they may result in torrential rainfall which causes flooding, property damage, and threats to human lives. Additionally, these storms cause great damage to nearshore habitats such as coral reefs not only through severe wind and wave movement, but also indirectly through the runoff of sediments and pollutants from rainfall (DPNR 2005b).

St. Croix hosts many types of tropical ecosystems, including coral reefs, seagrass beds, salt ponds, algal plains, and mangrove forests. These habitats provide food and shelter for a variety of marine and terrestrial life, both resident populations as well as
those that migrate through annually (DPNR 2005b). These resources and ecosystems are currently stressed, however, due to large-scale use by humans (e.g., diving, snorkeling, boating) and impacts from non-point source pollution, sewage, runoff, hurricanes, and climate change (DPNR 2005b; Rogers and Beets 2001; For a complete description, see Rothenberger, et al. 2008).

**Results: Findings from Research Reports and Grey Literature on Current Trends in St. Croix’s Commercial Fisheries and Status of Fish Stocks**

In this section I present data regarding St. Croix’s fishery today collected through archival research and review of reports and other grey literature. As described in Chapter 6, the St. Croix commercial fishery continues to be a multi-gear, multi-species fishery. Fishers use a variety of gears during a given week, and often use more than one kind of gear on any one trip. Additionally, fishers rarely target only one kind of fish and instead target several at one time. For example, Figure 10 shows the typical daily catch of commercial reef fishers, including parrotfish, angelfish, groupers, and triggerfish, among others.

Table 7 shows the total commercial landings of all species in St. Croix as well as the USVI overall. During the last decade, St. Croix’s commercial landings have fluctuated, between just over 500,000 pounds in 2009 to a high of over 1.3 million pounds in 2007. The drastic decrease in landings since 2007 is likely due to a variety of federal and territorial regulatory actions implemented since 2005, including the Caribbean Fishery Management Council’s (CFMC) response to the Sustainable Fisheries Act (SFA) and the enforcement of the gill and trammel net ban in territory waters (CFMC 2011).
Table 8 shows St. Croix’s commercial fisheries landings broken down by family or species group from 1998-2009 (CFMC 2011). This is not a comprehensive list of all species caught, but shows the reef species groups that are most targeted (snapper, grouper, parrotfish, conch, and spiny lobster) as well as a few that account for a large part
of the catch (grunts, triggerfish, and surgeonfish). These species are of particular interest because they play important roles in the ecology of coral reefs (Mumby, et al. 2006). Valdes-Pizzini et al. (2010) found that parrotfish, lobster, and conch were the top three landed species from 2003 - 2006, accounting for 56 percent of the total landings and close to 60 percent of the commercial fleet’s total revenue. Although more recent data is not yet available, it is likely these trends have been altered due to the enforcement of the net ban in 2008 (the implications of this are discussed later in the chapter).

**Gears Used**

Although Crucian commercial fishers are likely to use multiple gears during a single fishing trip (e.g., fish traps and speargun), certain gears account for a greater

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**Table 7. USVI commercial landings (in pounds), 1998-2009. Reproduced from CFMC 2011:161.**

<table>
<thead>
<tr>
<th>Year</th>
<th>St. Croix</th>
<th>St.Thomas/St. John</th>
<th>USVI</th>
<th>% St. Croix</th>
<th>% St. Thomas/St. John</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>660,857</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>683,016</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>802,254</td>
<td>618,806</td>
<td>1,421,060</td>
<td>56.45</td>
<td>43.55</td>
</tr>
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<td>2001</td>
<td>1,003,635</td>
<td>758,689</td>
<td>1,762,325</td>
<td>56.95</td>
<td>43.05</td>
</tr>
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<td>2002</td>
<td>1,112,137</td>
<td>821,448</td>
<td>1,933,585</td>
<td>57.52</td>
<td>42.48</td>
</tr>
<tr>
<td>2003</td>
<td>992,490</td>
<td>817,093</td>
<td>1,809,582</td>
<td>54.85</td>
<td>45.15</td>
</tr>
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<td>2004</td>
<td>1,033,448</td>
<td>811,864</td>
<td>1,845,312</td>
<td>56.00</td>
<td>44.00</td>
</tr>
<tr>
<td>2005</td>
<td>1,149,190</td>
<td>744,528</td>
<td>1,893,718</td>
<td>60.68</td>
<td>39.32</td>
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<td>2006</td>
<td>1,338,326</td>
<td>786,691</td>
<td>2,125,017</td>
<td>62.98</td>
<td>37.02</td>
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<td>2007</td>
<td>1,232,922</td>
<td>711,356</td>
<td>1,944,278</td>
<td>63.41</td>
<td>36.59</td>
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<td>2008</td>
<td>1,042,687</td>
<td>686,825</td>
<td>1,729,512</td>
<td>60.29</td>
<td>39.71</td>
</tr>
<tr>
<td>2009</td>
<td>547,320</td>
<td>359,824</td>
<td>907,144</td>
<td>60.33</td>
<td>39.67</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Landings</th>
<th>Snapper</th>
<th>% of Catch</th>
<th>Grouper</th>
<th>% of Catch</th>
<th>Parrotfish</th>
<th>% of Catch</th>
<th>Conch</th>
<th>% of Catch</th>
<th>Spiny Lobster</th>
<th>% of Catch</th>
<th>Grunts</th>
<th>% of Catch</th>
<th>Triggerfish</th>
<th>% of Catch</th>
<th>Surgeonfish</th>
<th>% of Catch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>660,857</td>
<td>60,654</td>
<td>9.18</td>
<td>18,204</td>
<td>2.75</td>
<td>213,459</td>
<td>32.30</td>
<td></td>
<td></td>
<td>32,563</td>
<td>4.93</td>
<td>24,900</td>
<td>3.77</td>
<td>41,020</td>
<td>6.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>683,016</td>
<td>64,106</td>
<td>9.39</td>
<td>20,573</td>
<td>3.01</td>
<td>235,861</td>
<td>34.53</td>
<td></td>
<td></td>
<td>30,203</td>
<td>4.42</td>
<td>23,647</td>
<td>3.46</td>
<td>34,596</td>
<td>5.07</td>
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<td></td>
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<tr>
<td>2000</td>
<td>802,254</td>
<td>80,817</td>
<td>10.07</td>
<td>23,807</td>
<td>2.97</td>
<td>260,474</td>
<td>32.47</td>
<td>76,999</td>
<td>9.60</td>
<td>89,020</td>
<td>11.10</td>
<td>30,767</td>
<td>4.34</td>
<td>22,815</td>
<td>2.84</td>
<td>36,992</td>
<td>4.61</td>
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<td>2001</td>
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<td>124,056</td>
<td>12.36</td>
<td>29,763</td>
<td>2.97</td>
<td>290,499</td>
<td>28.94</td>
<td>113,444</td>
<td>11.30</td>
<td>116,619</td>
<td>11.62</td>
<td>38,380</td>
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<td>4.41</td>
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<td>125,127</td>
<td>12.11</td>
<td>46,776</td>
<td>4.53</td>
<td>319,250</td>
<td>30.89</td>
<td>125,258</td>
<td>12.15</td>
<td>125,415</td>
<td>12.14</td>
<td>45,479</td>
<td>4.4</td>
<td>27,334</td>
<td>2.64</td>
<td>47,570</td>
<td>4.60</td>
</tr>
<tr>
<td>2005</td>
<td>1,149,190</td>
<td>150,288</td>
<td>13.08</td>
<td>39,551</td>
<td>3.44</td>
<td>376,389</td>
<td>32.75</td>
<td>161,452</td>
<td>14.05</td>
<td>120,929</td>
<td>10.52</td>
<td>44,261</td>
<td>3.85</td>
<td>26,717</td>
<td>2.32</td>
<td>48,853</td>
<td>4.25</td>
</tr>
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<td>2006</td>
<td>1,338,326</td>
<td>143,828</td>
<td>10.75</td>
<td>33,188</td>
<td>2.48</td>
<td>416,074</td>
<td>31.09</td>
<td>221,966</td>
<td>16.59</td>
<td>147,173</td>
<td>11.00</td>
<td>44,862</td>
<td>3.35</td>
<td>26,010</td>
<td>1.94</td>
<td>51,293</td>
<td>3.83</td>
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<tr>
<td>2008</td>
<td>1,042,687</td>
<td>92,316</td>
<td>8.84</td>
<td>20,762</td>
<td>1.96</td>
<td>278,080</td>
<td>26.35</td>
<td>71,064</td>
<td>6.75</td>
<td>149,234</td>
<td>14.31</td>
<td>40,199</td>
<td>3.84</td>
<td>32,832</td>
<td>3.15</td>
<td>38,229</td>
<td>3.67</td>
</tr>
<tr>
<td>2009</td>
<td>547,320</td>
<td>49,528</td>
<td>8.94</td>
<td>18,762</td>
<td>3.43</td>
<td>173,250</td>
<td>31.70</td>
<td>64,086</td>
<td>11.70</td>
<td>120,929</td>
<td>21.84</td>
<td>38,229</td>
<td>7.01</td>
<td>19,748</td>
<td>3.61</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
percentage of the island’s overall landings. Figure 11 shows the total commercial landings for St. Croix broken down by gear type from 1975 - 2006. It is important to note the increase in landings from nets and diving since the mid-1990s, which corresponds with the decrease in landings from traps. As described in Chapter 6, fish traps have been a culturally significant and historically important fishing gear in the USVI for many years. However, several factors led to the decrease in the use of fish traps by Crucian commercial fishers in the 1990s. Between 1989 and 1999, several hurricanes impacted the island, including Hurricanes Hugo (1989), Luis and Marilyn (1995), Bertha and Hortense (1996), Georges (1998) and Lenny (1999). As a result of these storms fishers lost a significant number of traps and were unable to obtain loans or federal grants to replace their gear. At the same time, commercial fishing gear suppliers began marketing gill and trammel nets in the USVI after these nets were banned in Florida state waters in 1994 (Tobias and Toller 2004). Many fishers adopted the use of
these nets, as they had higher catch rates and, therefore, higher economic returns, and they no longer risked gear loss due to weather events or theft because the nets did not have to be left in the water unattended.

Although the data available regarding what gears were used to harvest which species are inconsistent (e.g., data is available for different year spans), Table 9 summarizes some of the general trends and important points relative to the species included in Table 8 (CFMC 2010c, 2011). It is worthwhile to note the importance of Table 9. General trends in gears used to harvest important commercial species in St. Croix. For fish species, “scuba with speargun” refers to using spearfishing gear while scuba diving. For conch and lobster, “scuba” refers to collecting the species by hand or using allowable gear (such as a lobster lasso) while scuba diving. Adapted from CFMC 2010c, 2011.

<table>
<thead>
<tr>
<th>Fish</th>
<th>Main gear (% of harvest)</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snapper</td>
<td>Line (66%)</td>
<td>1998—2007</td>
</tr>
<tr>
<td>Grouper</td>
<td>Scuba with speargun (40%)</td>
<td>1998—2007</td>
</tr>
<tr>
<td></td>
<td>Line (40%)</td>
<td>1998—2007</td>
</tr>
<tr>
<td>Parrotfish</td>
<td>Gill and trammel nets (34.85%)</td>
<td>1999—2006</td>
</tr>
<tr>
<td></td>
<td>Gill and trammel nets (21.63%)</td>
<td>2007</td>
</tr>
<tr>
<td>Conch</td>
<td>Freediving and scuba (97%)</td>
<td>2000—2007</td>
</tr>
<tr>
<td>Lobster</td>
<td>Freediving and scuba (92.34%)</td>
<td>1998—2009</td>
</tr>
<tr>
<td>Grunts</td>
<td>Traps (49.35%)</td>
<td>1998—2008</td>
</tr>
<tr>
<td></td>
<td>Scuba with speargun (59.85%)</td>
<td>2009</td>
</tr>
<tr>
<td>Surgeonfish</td>
<td>Scuba with speargun (35.14%)</td>
<td>1998—2008</td>
</tr>
<tr>
<td></td>
<td>Scuba with speargun (74.38%)</td>
<td>2009</td>
</tr>
<tr>
<td>Triggerfish</td>
<td>Scuba with speargun (16.10%)</td>
<td>1998—2008</td>
</tr>
<tr>
<td></td>
<td>Scuba with speargun (60.90%)</td>
<td>2009</td>
</tr>
</tbody>
</table>
using scuba to fish for multiple kinds of finfish or shellfish, and although it is not listed separately in regards to parrotfish landings, many fishers use scuba to enable divers to herd large schools of fish into the gill or trammel nets while they are fishing. Despite the long-term use and historical importance of fish traps, they are listed as a primary gear only for grunts (fish family Haemulidae).

Status of Stocks

Currently, there are five species or species groups that NMFS has identified as undergoing overfishing in the United States (US) Caribbean. These groups are: queen conch, parrotfish, grouper unit 1 (Nassau grouper), grouper unit 4 (tiger, yellowfin, red, misty, and yellowedge grouper), and snapper unit 1 (black, blackfin, silk, and vermilion snapper). These determinations are documented in the NMFS quarterly reports to Congress on the status of US fisheries (NMFS 2011). Although there have been few formal stock assessments conducted regarding USVI fisheries, every scientific assessment conducted in the region in the past 30 years has shown some degree of overfishing, with trends worsening over time (Appeldoorn 2008). These assessments have shown significant changes in reef fish assemblages and the composition of reef fish landings (Appeldoorn, et al. 1992; Rogers and Beets 2001), the collapse of the Nassau grouper fishery in the 1970s (Olsen and LaPlace 1979) and the red hind fishery in the 1980s (Beets and Friedlander 1992), and the overall decline of other large snappers and groupers over the past 30 years in the USVI (Jeffrey, et al. 2005; Rothenberger, et al.

34 According to NMFS (2006), “overfishing” occurs whenever a stock or stock complex is subjected to a rate or level of fishing mortality that jeopardizes the capacity of a stock or stock complex to produce maximum sustainable yield (MSY) on a continuing basis. Maximum sustainable yield (MSY) is the amount of biomass or the number of units that can be harvested currently in a fishery without compromising the ability of the population/ecosystem to regenerate itself.
2008). Of particular importance has been the increase in landings of parrotfish and other herbivorous fish, which scientists claim not only indicates “serial overfishing”35 (Ault, et al. 1998), but is also alarming because of the important role herbivores play in overall coral reef ecosystem health as grazers that keep algal growth in check (Mumby, et al. 2006).

For NMFS and CFMC scientists, the biggest challenge in conducting a comprehensive stock assessment for council-managed species is the lack of reliable and usable catch data for USVI fisheries. Although commercial fisheries landings data have been collected since 1975, the catch was not reported for each species individually, which is required for NMFS scientists to assess historical trends in the manner they would like. Finfish landings have been reliably reported to the species group or family level (e.g., snapper, grouper, parrotfish) since 1998 in St. Croix, but even the resolution of this data is not small enough to conduct the type of species-specific analysis NMFS and the CFMC would like (CFMC 2010c). Although queen conch landings have been reported to the species level since 1998, spiny lobster has only been reported to the family level.

Aside from the lack of species-specific data for the USVI, there are many other concerns regarding the commercial landings data. Data are often missing, incomplete, or the parameters not consistent enough over time to allow for comparison across years (SEDAR 2009). Additionally, it is common knowledge among commercial fishers, fisheries managers, and other marine resource stakeholders in St. Croix that the data provided by fishers in their commercial catch reports is not very accurate or reliable. Although commercial fishers are legally required to turn in their catch reports on a

35 “Serial overfishing” occurs when the abundance of larger species (such as large snappers and groupers) decrease to unfishable levels, forcing fishers to target smaller and less desirable species. See Ault, et al. 1998 and Jeffrey, et al. 2005.
monthly basis, this regulation is not enforced. Fishers often turn them in to the USVI Department of Fish and Wildlife (DFW) on a much less frequent basis, or turn in all 12-months’ worth of catch reports when they go to renew their commercial license in July each year, admittedly filling out the forms based on what they usually catch right before renewing their license. While several fishers suggest this reflects forgetfulness or their inability to understand why reporting their catch is important, members of other stakeholder groups (such as dive shop owners and local marine scientists) believe commercial fishers purposefully report inaccurate catch levels in order to reduce potential fishery closures. Regardless of the reasons for misreporting or inaccuracies in the data, the result is a dataset that is used in certain cases by the CFMC or USVI Department of Planning and Natural Resources (DPNR) because it is the best available data, but it is widely questioned by all. Moreover, as described in Chapter 5, semi-structured and informal interviews with fishers, managers, and environmental non-governmental organizations (ENGOs) indicate that the lack of data is a major barrier to federal management being carried out as it is legislated to be.

**Current Description of St. Croix Commercial Fishers**

Following the 1968 survey conducted by Swingle et al. (1970) discussed in Chapter 6, the next comprehensive description of USVI commercial fishers was not completed until 2003-2004. For that census, over 70 percent of the licensed commercial fishers from St. Thomas/St. John were interviewed, and all (n = 223) of the licensed commercial fishers from St. Croix were interviewed. Although the report (Kojis 2004) includes a vast amount of data for the territory as a whole, I will focus mainly on the data

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36 Because there are so few fishers from St. John, St. John is grouped together with nearby St. Thomas into a single district.
specifically related to St. Croix’s commercial fishers. Kojis (2004) found the average age of fishers was 51 years, and they had fished for an average of 22 years. The majority of commercial fishers self-identified as Hispanic (48.4%) or black or West Indian (41.6%), while only 7.7 percent self-identified as white. Additionally, 64 percent of Crucian commercial fishers had not completed high school. These data provide support for Stoffle et al.’s (2009) and Valdes-Pizzini et al.’s (2010) contention that commercial fishing is an important source of employment and income for the non-white component of the population, especially those who are not able to participate in other sectors of the economy due to a lack of skills, knowledge, or education.

Kojis (2004) found that 61 percent of fishers considered themselves full-time fishers (defined as spending more than 36 hours each week fishing and carrying out fishing-related activities such as repairing gear and selling their catch), while 31.5 percent considered themselves to be part-time fishers (less than 36 hours per week). Related to this, Kojis found that 54 percent of the commercial fishers derived more than half of their income from commercial fishing, 13 percent derived between a quarter and half of their income from commercial fishing, and a third (33%) derived less than a quarter of their income from commercial fishing. These data indicate the occupational multiplicity that is characteristic of many Caribbean coastal communities as described previously in Chapter 6. As with the various commercial fisheries surveys conducted previously and described in Chapter 6 (Bureau of the Census 1918; Fiedler and Jarvis 1932; Swingle, et al. 1970), Kojis (2004) found that Crucian fishing boats continue to be relatively small in size (79.8% of boats between 16 and 25 feet in length). Almost all (92.5%) commercial fishing boats in St. Croix were powered by outboard engines, ranging between 26 and
150 horsepower. Most Crucian commercial fishers trailer their boats, storing them between fishing trips and repairing them at home.

Tables 10 through 12 attest to the multi-species and multi-method nature of St. Croix’s fishery. These data, taken from Kojis (2004), were collected before the enforcement of the gill and trammel net ban in 2008. It is likely, therefore, that current data would reflect the movement of commercial fishers out of the gill and trammel net fisheries and into the fish trap, scuba, and line fisheries.

Table 10. Categories of fish targeted by commercial fishers in St. Croix. Sum of percents is greater than 100% because fishers selected all categories they target. From Kojis 2004.

<table>
<thead>
<tr>
<th>Commercial Fishers’ Targeted Species</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Species Targeted</td>
<td>% of Fishers</td>
</tr>
<tr>
<td>Reef Fish</td>
<td>84.7</td>
</tr>
<tr>
<td>Coastal Pelagic</td>
<td>37.2</td>
</tr>
<tr>
<td>Deepwater Pelagic</td>
<td>33.0</td>
</tr>
<tr>
<td>Deepwater Snapper</td>
<td>42.3</td>
</tr>
<tr>
<td>Bait Fish</td>
<td>14.4</td>
</tr>
<tr>
<td>Conch</td>
<td>39.1</td>
</tr>
<tr>
<td>Whelk</td>
<td>4.7</td>
</tr>
<tr>
<td>Lobster</td>
<td>40.5</td>
</tr>
</tbody>
</table>
Table 11. Number of categories (from Table 10) of fish targeted by commercial fishers in St. Croix. From Kojis 2004.

<table>
<thead>
<tr>
<th>Number of Categories Fished</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td># of Categories</td>
<td>% of Fishers</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>19.1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>27.4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>22.3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>16.3</td>
<td></td>
</tr>
<tr>
<td>≥5</td>
<td>14.9</td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Fishing Gears / Methods Used by Commercial Fishers</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear</td>
<td>% of Fishers</td>
<td></td>
</tr>
<tr>
<td>Gill net</td>
<td>15.7</td>
<td></td>
</tr>
<tr>
<td>Trammel Net</td>
<td>4.0</td>
<td></td>
</tr>
<tr>
<td>Cast Net</td>
<td>44.8</td>
<td></td>
</tr>
<tr>
<td>Fish Trap</td>
<td>30.9</td>
<td></td>
</tr>
<tr>
<td>Vertical Setline (Multi-Hook)</td>
<td>29.1</td>
<td></td>
</tr>
<tr>
<td>Hand Line / Rod and Reel</td>
<td>57.4</td>
<td></td>
</tr>
<tr>
<td>Freediving</td>
<td>17.9</td>
<td></td>
</tr>
<tr>
<td>SCUBA</td>
<td>37.2</td>
<td></td>
</tr>
</tbody>
</table>
As found in previous surveys (Bureau of the Census 1918; Fiedler and Jarvis 1932; Swingle, et al. 1970) commercial fishers in St. Croix continue to sell their fish at markets, at landing sites, and by delivering to restaurants, resorts, or private buyers. Fishers often have orders from restaurant or resort owners, such as lobster and conch, that are automatically delivered to the establishments when the fishers have returned to shore. Other times, after arriving back to land, fishers will call those businesses that frequently make purchases, offering to sell them the day’s catch. The catch that is not sold through these means is sold primarily at the make-shift La Reine fish market or at other locations along the road where customers will stop to make purchases. Unlike the previous
surveys indicated, however, almost all fish today is kept on ice, with reef fish usually presented to customers in coolers at the market or on the road side (Figure 12).

**Recent Management Measures**

This section describes two recent management measures that have been implemented in St. Croix—the territorial ban of gill and trammel nets and the federal requirement for the Caribbean Fishery Management Council (CFMC) to develop and implement annual catch limits (ACLs) for all federally managed species. I will describe the impetus for each measure as well as their implications for St. Croix’s fisheries. Much of the analyses presented in Chapters 8 and 9 reflect participants’ experiences with the management process in terms of these two recent regulations, as they were the focus of the majority of regulatory actions being implemented during my fieldwork. For this reason, while I describe these recent management measures as the result of archival research, I also include a small amount of very general ethnographic data in order to establish their controversial nature.

**Gill and Trammel Net Ban**

As described earlier in the chapter, the loss of fish traps from a series of hurricanes between 1989 and 1999 led many commercial fishers in St. Croix to switch to using gill and trammel nets. This shift in gear use is reflected in landings data. In the 1990-1991 fishing year, 88.7% of St. Croix’s reef fish landings were from traps and 11.3 percent were from nets. By 2003, this trend had reversed, with only 42.8% of reef fish landings coming from traps and 57.2% from nets (Tobias and Toller 2004). For the 2002-2003 fishing year, parrotfish and surgeonfish made up the majority of the net landings, accounting for 56.2 percent and 12.9 percent respectively. Of all parrotfish
landed that year, 75.9 percent were caught by nets and 23.6 percent were caught by traps (Tobias and Toller 2004).

DPNR staff, ENGOs, and other user groups became greatly concerned with the significant increase in harvest capacity afforded by the use of nets, as well as the negative effects the use of gill and trammel nets have on corals, benthic communities, and endangered species such as sea turtles (Jennings and Polunin 1996; Munroe, et al. 1987; Tobias and Toller 2004). Net fishers adopted very effective methods of using the nets to capture entire schools of fish at once, and most often parrotfish were targeted due to market demand. Additionally, some fishers also used scuba divers to help herd the fish directly into the net. Dive shop employees and other divers began reporting significant changes in the number of parrotfish seen at popular reef dive sites, as well as cases where they came across derelict nets that were “ghostfishing”37 and episodes when gill nets would be left at reef sites for over 24 hours, which resulted in a great deal of bycatch as well as spoilage of marketable fish. Additional concern was raised in 2002 and 2003 when quantities of fish, turtles, corals, and other invertebrates were found dumped at various locations on the island (Duval 2003). It was assumed the fish were dumped because there were too many fish to be sold, and the other species were dumped as bycatch.

Although according to commercial catch reports from 2002—2003 198,409 pounds of fish were caught by nets that year, DPNR scientists had reason to believe that the actual amount of landings was much higher. In his 2004 report, Tobias and Toller

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37 “Ghostfishing” occurs when a net is abandoned by a fisher and continues to catch fish unattended. This results in a variety of species—fish, turtles, sharks, corals, invertebrates—getting caught in the net and being killed.
(2004) estimated the annual net landings to be approximately 1.3 million pounds based on port sampling averages. While they admitted that there may be substantial errors in their estimation process, they still suggested the data indicate net fishers were significantly under-reporting their catch on catch report forms.

In response to concerns raised by non-net commercial fishers, ENGOs, and dive shop owners, the St. Croix FAC reviewed the issue and ultimately recommended a ban on the use of gill and trammel nets in territorial waters in 2002 to the DPNR Commissioner.38 The issue was highly contentious, however, and the implementation of the ban was stalled as the debate continued. Net fishers, who numbered 43 individuals (34 gill net and 9 trammel net fishers) in 2003 according to Kojis (2004), felt that a complete ban on gill and trammel nets would devastate them economically, and instead supported seasonal or area closures to reduce the overall catch (Toller and Tobias 2007). The general sentiment, however, of members of all stakeholder groups was that the netfishing was a main problem for St. Croix’s fisheries, due to the high catches of the nets and the apparent decrease in the number of targeted species such as parrotfish. Of the 215 Crucian commercial fishers who were interviewed in the 2004 commercial fisher census, 67.8 percent responded they felt fishing was worse than it was 10 years ago; 38.9 percent of those fishers attributed the change to the fact that net fishers were taking too many fish (Kojis 2004). Additionally, opinion surveys conducted with commercial fishers and the marine recreational industry (Gordon and Uwate 2003) and recreational fishing club members (Messineo and Uwate 2004) demonstrated that members of these

38 The actual regulation that was recommended and ultimately passed banned the use of trammel nets and limited the use of gill nets for other than baitfish and flying fish. For the purposes of this dissertation, this is referred to as the “net ban.”
groups felt overfishing with gill and trammel nets was a main problem for St. Croix’s marine resources.

Through NOAA’s Coral Reef Conservation Program, DPNR received a $75,000 grant to implement a one-time buy-back of gill and trammel nets in St. Croix. The buy-back plan was proposed to provide financial assistance to net fishers during transition from nets to other gear types, and a strategy was developed in which fishers received compensation based on their reported landings during the previous five years. Public hearings regarding the ban and the buy-back program were held in 2005, and net fishers expressed concerns that the compensation levels were too low, and again reiterated their opinion that a regulated fishery or temporal closures would be a better option (Niesten and Gjertsen 2010). Although the regulations for the ban were technically approved in 2006, fishers were further encouraged to develop their own gill and trammel net management plan when a new Director of DFW took the position in 2007. Hearings were held with members of the USVI government in which the net fishers (with the support of the DFW Director) presented their self-imposed management plan which included a quota-based harvest, closed seasons, and non-transferable licenses. Non-commercial fisher members of the St. Croix marine recreation industry and local marine scientists presented their arguments for the complete ban of the gear as well. Ultimately, the DPNR Commissioner and USVI Governor upheld the net ban, leading to the resignation of the DFW Director and the enforcement of the ban, and the eventual implementation of the buy-back program in 2008 (Lohr 2008; Niesten and Gjertsen 2010).
When I arrived in St. Croix in March 2009, the net ban continued to be a widely-discussed issue. Ethnographic data collected through all methods (semi-structured and informal interviews, participant observation, observations at meetings) indicated that the enforcement of the ban remained highly contentious, and stories circulated of how the nets fishers had turned in were purposely placed in an unlocked container at DEE so that the fishers could easily reclaim them. Although most blatant use of the gill nets ceased, participant observation and informal interviews with fishers indicated that a few fishers continue to use the nets because they know the risk of being caught is low due to the lack of enforcement. Additionally, the lengthy six-year process—from the FAC proposal for the ban in 2002, to the passing of the legislation in 2006, to the implementation of the buy-back program and enforcement of the ban in 2008—has had a lasting, polarizing impact on the St. Croix FAC. Moreover, the process has greatly influenced stakeholders’ perceptions of the management process and the extent to which they participate in it. These points will be further expanded in Chapters 8 and 9.

**Implementation of Annual Catch Limits (ACLs)**

Another controversial regulatory action that is currently being discussed and implemented in St. Croix (and throughout all NMFS regions) is the establishment of annual catch limits (ACLs) for all council-managed species. An ACL is the amount of fish allowed to be caught in a year, and the 2006 amendments to the MSA require their implementation in order to reduce overfishing in the nation’s fisheries (CFMC 2010c). The Congressionally-mandated amendments specify that ACLs must be established for all fisheries considered to be undergoing overfishing by 2010 and all other fisheries by 2011. For the US Caribbean, this required ACLs be established for the five species or
species groups mentioned previously in the chapter: (1) queen conch, (2) parrotfish, (3) grouper unit 1 (Nassau grouper), (4) grouper unit 4 (tiger, yellowfin, red, misty, and yellowedge grouper), and (5) snapper unit 1 (black, blackfin, silk, and vermillion snapper).

The establishment of ACLs for these five species and species groups was the main topic of discussion in the federal fisheries management arena during my tenure in St. Croix. Of particular concern by all parties was the fact that the type of data needed for the CFMC Science and Statistical Committee (SSC) to develop accurate ACLs was not available. This triggered a comprehensive examination of USVI fisheries data available as well as the USVI data collection process, which led to a complete revision of the territory’s commercial catch report form (CFMC 2011; SEDAR 2009). Despite the recognition that important data was unavailable, the CFMC was still required to establish ACLs for the overfished species by the end of 2010 and so had no choice but to move forward with the contentious process, and the amendment was passed by the CFMC at the end of the year (CFMC 2011).

While the dissertation examines commercial fishers’ and others’ perceptions of and experiences regarding the fisheries management process, the development of ACLs by the CFMC provided a particular regulatory action in which my research could be grounded. As such, I asked specific questions about ACLs during semi-structured and informal interviews. This was effective in that it allowed for discussion of a concrete example with which individuals could describe the extent to which they were involved in the management process as well as the reasons behind their actions.
Results: Findings from Semi-Structured Interviews—Local Perspectives of the Marine Environment

In this section, I present data collected through semi-structured interviews with commercial fishers and other stakeholders regarding their perspectives of the marine environment. In order to examine Crucian commercial fishers’ perceptions of and experiences with fisheries management processes, we must also take into consideration the perspectives of different groups regarding marine environment conditions. As described in Chapter 2, research regarding local ecological knowledge (LEK) has identified many challenges associated with utilizing LEK in conjunction with “scientific” knowledge in the development of resource management plans (Agrawal 1995; Berkes 1999). While documentation of LEK is not a main objective of this dissertation, it was important to identify differences between how fishers, managers, and others involved in fisheries management in St. Croix perceive the marine environment. These perceptions, in turn, directly impact how resource management processes are perceived and are discussed in more detail below.

Data collected through semi-structured interviews suggest that local perspectives of the state of the marine environment and the status of St. Croix’s fisheries reflect stakeholder group membership and ethnicity. As has commonly been documented in other locations (Berkes 1999; Johannes, et al. 2000), there is often a difference in how resources are perceived between those whose livelihoods depend on the extractive use of a natural resource and those scientists and others who do not depend on the extractive use. In St. Croix, this was exemplified in two ways. First, non-commercial fishers in the study were more likely to perceive the local marine environment and reef fisheries as
being in a state of severe degradation. Most of these individuals also happened to be white and non-native Virgin Islanders. While these individuals acknowledged the wide range of causes for reef degradation and reef fish depletion in St. Croix, including the dumping of raw sewage into the near-shore environment, pollution from HOVENSA and Cruzan Rum Factory, and other sources of point and non-point source pollution, they believed the overfishing of reef species—particularly with gill nets—to be the main cause of reef degradation. As one marine-related business owner stated:

Yeah there’s other things going on. I’ve been out there on the water by the sewage outlet and seen the raw sewage coming out, and I see the muddy water that just streams down [from the hillside] through town and out into the bay after it rains. And of course those things impact the fish. But I have a hard time believing they have as big an impact as when the guys go out and catch a whole school of reef fish at once.

Other participants, including dive shop owners, ENGO representatives, and St. Croix Fisheries Advisory Committee (FAC) members offered similar opinions regarding the causes of reef degradation. Although responses varied in terms of the other causes cited, almost all participants who were not commercial fishers stated quite adamantly that overfishing was the main cause for the degraded condition of the reefs. This echoes similar beliefs regarding fishers’ likelihood of completely using a resource until it is gone, which is one underlying assumption of Hardin’s (1968) “tragedy of the commons” theory.

While many commercial fishers also felt the marine environment is experiencing degradation, they were much less likely to pinpoint overfishing as the primary cause of that degradation. They often mentioned the dredging and pollution on the south shore of the island for the HOVENSA industrial complex as an important cause of reef degradation. Additionally, they often echoed the data presented in Chapter 4 regarding
the loss of important reef fish nursery areas when the industrial complex was built. Runoff and the direct dumping of sewage were also frequently mentioned by fishers during semi-structured interviews. While some fishers did suggest that overfishing played a role in reef degradation, they stressed that declines in reef health and fish populations were related to a combination of factors and not just one (fishing). As one fisher commented:

_We’re always the ones they blame. Not HOVENSA, not the sewage, not the development. Just us. They don’t hold none of them accountable._

These sentiments were echoed at almost all of the CFMC public hearings I attended, where at least one fisher made a similar comment to the one above, stating that the fishers were unfairly blamed. These statements are important to note because they indicate fishers’ perceptions that the territorial and federal fisheries management agencies do not hold other contributors to degradation accountable.

Second, participants’ opinions differed in how and the extent to which they believed reef resources should be used. While many commercial fishers recognized the need to use fisheries resources sustainably, and acknowledged the importance of regulations in order to achieve that goal, they also stressed the fact that they were fishing to earn a living and to feed their families. Many of them stated that the fish were there for them to use, and that they were performing a service by providing island residents with a source of food. In reference to scientists’, managers’, and other conservationists’ efforts to “save the fish,” commercial fishers felt this was evidence of those individuals putting animals before people, which was something they could not understand. As one fisher stated:
They always want to save the fish, save the fish. What about us? What am I supposed to eat?

Non-commercial fishers, on the other hand, stressed the importance of conserving and preserving the reef resources. For some groups, such as the dive shop owners, the reasoning behind these opinions was relatively straightforward: divers come to St. Croix to go diving and to see fish and other marine life on the reefs; if there are no more fish to see, then divers may not come to the island. For these individuals, their livelihoods are also directly dependent on the number of fish in the water, but in a non-extractive manner. However, for other non-commercial fishers, such as the white Continentals who worked for DPNR or NMFS, these opinions are likely to reflect the Western scientific preservation ethic in which they grew up and were educated, which places value on keeping natural environments pristine and not used by humans. As a result, their opinions of how fish should be “used” (or not used) is quite different from the fishers’ whose livelihood depends on resource extraction.

These differences in perspectives regarding marine resources are important to include in a discussion about St. Croix’s biophysical environment because they remind us that even scientific data, which is supposed to be “correct,” is open to interpretation and influenced by the experiences and beliefs of the interpreter. Moreover, for management to be effective, these differences must be taken into consideration.

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39 This ethic suggests that in order to do this, resource extraction must be restricted and even prohibited (Cronon 1996). Although in theory, “preservation” and “conservation” are two different approaches, this difference was difficult to discern among fisheries management stakeholders in St. Croix.
Chapter Summary

Building on the historical fisheries data presented in Chapter 6, in this chapter I used data collected through archival research of reports and other grey literature to describe the current state of St. Croix’s fishery, focusing on the status of important fish stocks, characteristics of the island’s commercial fishers, and common fishing practices employed today. These data indicate that certain aspects of the fishery today are similar to those in the past, such as the small-scale, multi-species, multi-method nature of the fishery. Changes in catch composition and gear use reflect the implementation of regulations, especially since 2005, such as the CFMC’s regulatory response to the reauthorization of the Sustainable Fisheries Act and the enforcement of the net ban in territorial waters.

As mentioned in Chapter 5 and described in greater detail here, one of the biggest barriers to effective federal fisheries management in St. Croix is the lack of reliable and usable fisheries data. The Congressional mandate to implement ACLs in all US regions provides a clear and timely example for examining the mismatch that exists between the management actions the federal management system (based largely on a centralized structure that uses management measures geared toward achieving resource sustainability in large-scale, industrialized fisheries) requires and the ability of the CFMC to implement these measures in St. Croix. Additionally, examining the recent ban of gill and trammel nets in territorial waters and the subsequent enforcement of the ban in 2008 is critical to understanding the polarizing effect this regulatory action has had on those involved in fisheries management in St. Croix, and what that means for fishers and other stakeholders negotiating for power over the management process. In the next chapter, I use these data
regarding historical and contemporary fishery conditions in order to examine the social
and political factors that occur across multiple management scales that affect the extent to
which fishers and other stakeholders participate in the federal management process, as
well as their knowledge of and beliefs about fisheries management in St. Croix. Chapter
9 then focuses on how historical patterns of ethnicity, power, and the organization of the
commercial fishers are related to patterns of participation.
CHAPTER 8

RESULTS: THE STRUCTURE OF FISHERIES MANAGEMENT IN ST. CROIX AND PARTICIPATION BY FISHERS AND NON-FISHERS

Chapter Overview

In this chapter, I present the results of quantitative and qualitative data analyses performed on semi-structured interview data, and compare participants’ responses regarding their knowledge of, participation in, and beliefs about fisheries management in St. Croix. The quantitative semi-structured interview data are presented by topic, and explanations for the similarities and differences found between groups are provided using qualitative data from semi-structured interviews (such as direct quotes), participant observation, informal conversations, and meeting observation (and are marked as such). These analyses are important because they address my research questions regarding how commercial fishers and others participate in the management process, and the extent to which they perceive their participation to influence management decisions. Additionally, this chapter describes how the structure of the federal fisheries management system affects the manner in which stakeholders participate in and influence the management process. More specifically I discuss the lack of cooperation between territorial and federal management systems, and the effect it has on stakeholder participation. Additionally, I describe how commercial fishers participated in the annual catch limit
(ACL) development process, and how they perceived their ability to influence the process.

**Comparing Fishers and Non-Fishers: Knowledge, Participation, and Beliefs**

In this section, I examine semi-structured interview participants’ responses to a series of questions regarding their knowledge of, participation in, and beliefs about fisheries management in St. Croix. As described in Chapter 3, my sampling strategy changed after arriving in St. Croix for two reasons: (1) several stakeholder groups I planned to interview had only small numbers of potential participants, and (2) many of the individuals who were most involved in the fisheries management process and, therefore, likely to be the most knowledgeable, were members of multiple stakeholder groups. For these reasons, and because the primary focus of my research was regarding the commercial fishers, I decided to divide my total sample into two groups—“fishers” and “non-fishers”—for analysis. Participants who held fishing licenses and were currently fishing commercially were placed in the “fishers” group (n = 52), and all other participants were placed in the “non-fishers” (n = 35) group. Because many of the Caribbean Fishery Management Council (CFMC) interviews were different from those conducted with other groups, and many of the questions that had been asked of all other participants were not asked of CFMC participants due to a lack of relevancy, those participants who only belonged to the CFMC group (n = 5) were not included in either group (fishers or non-fishers). Because the samples were not random and the assumptions of normal distributions could not be met, differences between groups were analyzed using a suite of non-parametric statistical procedures.
Differences Between Fishers and Non-Fishers on Demographic Variables

As described in Chapter 2, research in political ecology examines how social differences and inequalities influence how natural resources are perceived and used, and which individuals or groups have the power to control access to resources and management decisions (Gezon and Paulson 2005). Integral to this discussion regarding differences between fishers’ and non-fishers’ fisheries management knowledge, participation, and beliefs is an examination of the relationship between demographic variables and these differences.

Results from Semi-Structured Interviews

Table 13 shows the results of tests used to compare fishers and non-fishers in terms of basic demographic variables. The results indicate the two groups differ significantly in terms of age, with fishers being younger (mean = 40.69 years) on average than non-fishers (mean = 49 years). Additionally, the two groups differed significantly in terms of how long they lived in St. Croix, with fishers having lived longer on the island (mean = 34.9 years) than non-fishers (mean = 22.09 years). The two groups also differed significantly in terms of education level. As Figure 13 indicates, 68.6 percent of the fishers in the sample did not complete high school, while all of the non-fishers completed high school and 78.1 percent completed college and/or graduate school. There was also a significant difference between the two groups in terms of ethnicity. Figure 14 shows the ethnic break-down of each group, and it is easy to see that almost 80 percent of the non-fishers are white, while fishers are primarily Hispanic (57.69%), Crucian (23.08%), or black (19.23%).
Table 13. Results of tests comparing fishers and non-fishers on demographic variables. W-M-W=Wilcoxon-Mann-Whitney two-sample rank-sum test; 1=test violated assumptions, so results may not be meaningful. *=significant to the .05 level; **=significant to the .005 level.

<table>
<thead>
<tr>
<th>DEMOGRAPHICS</th>
<th>Test Used</th>
<th>Test Statistic</th>
<th>Sig. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>W-M-W</td>
<td>U=590.5</td>
<td>( p = .026 ) *</td>
</tr>
<tr>
<td><code># of years living in STX</code></td>
<td>W-M-W</td>
<td>U=471</td>
<td>( p = .001 ) **</td>
</tr>
<tr>
<td>Highest level of education completed</td>
<td>W-M-W</td>
<td>U=55</td>
<td>( p &lt; .001 ) **</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>chi-square</td>
<td>( \chi^2(3, n=86)=62.639 )</td>
<td>( p &lt; .001 ) **</td>
</tr>
</tbody>
</table>

Figure 13. Graph comparing highest level of education completed for fishers and non-fishers.
Discussion

The demographic differences between fishers and non-fishers in the study are not surprising, and reflect general patterns of ethnicity, island tenure, occupation, and education found in the island’s society (described in detail in Chapters 4 and 6). Many of the fishers were either born in St. Croix, or born on a nearby island such as Puerto Rico or Vieques and moved to St. Croix with their parents at a very early age. One fisher described:

*I moved here with my family from Puerto Rico when I was about four or five. My father was a fisherman there, so that’s what he did when he got here. So I spent a lot of my childhood on his boat. Or at the beach helping him with the pots and nets.*
Other fishers I interviewed arrived in the late 1960s as part of the wave of immigrants who moved to the island to work as tradesmen in the building of the industrial complexes of HOVENSA or Harvey Alumina, then moved into fishing once the construction was completed. While many of the fishers practice the occupational multiplicity discussed in previous chapters, they persist in their practice of commercial fishing, and most of them indicate they plan to fish until they are no longer physically capable of doing so. When they were asked: “For how many years do you expect to keep fishing?” many responded with phrases such as “forever,” “until I can’t any longer,” or “until God says I’m done.” Their reasons for continuing in the occupation are plentiful, and they reflect the general sentiments found by fisheries anthropologists studying fishers in other locations throughout the world, including the desire to be one’s own boss, the independence it affords them, and the joy and therapeutic benefits being on the ocean provides them (Acheson 1981; Pollnac and Poggie 1988, 2006). Despite being continually frustrated by what fishers consider to be the constant bombardment of more and more regulations from the federal government, they continue to use commercial fishing as a primary source of income.

Of the white non-fishers, none were born in St. Croix, and typically moved to the island as adults, pursuing a career in the diving industry or environmental conservation. Often, it was vacation or scientific research that brought them first to the island, then they actively sought ways to move their lives to St. Croix. As one scientist explained:

*I originally came down after school because there just weren’t any jobs where I lived. Went to St. Thomas to dive, then eventually got a government job in St. Croix. Been here ever since... for about 32 years.*

Another non-fisher, the owner of a dive shop described what brought him to the island:
I was based in St. Croix for my last job. Kinda got into diving on a whim while I was here. Then I met [my wife], and when the company went out of business we decided to stay.

In most cases, non-fishers grew up and were educated in the continental US, then moved to St. Croix as adults. However, even though many non-fishers have lived in St. Croix for 20 or 30 years, because of their skin color and the kinds of jobs they hold (scientists, dive shop owners), they are still perceived as “outsiders” by most fishers and other non-white island residents.

Because fishers and non-fishers differed significantly on a number of demographic variables, it is difficult to determine which factor, if any, contributes the most to the two groups’ knowledge of territorial and federal processes. Although statistical models proved inconclusive regarding this point, data collected through participant observation, observation and meetings, and informal and semi-structured interviews help shed light on these complicated relationships.

Fisheries Management Knowledge

Results from Semi-Structured Interviews

Fishers and non-fishers were compared on responses to five variables relating to their knowledge regarding fisheries management. Table 14 shows the results of these tests. During semi-structured interviews participants were asked a series of questions in order to assess the extent to which they were aware that there are different fisheries regulations for territorial and federal waters, as well as if they knew which specific groups or individuals were responsible for developing the regulations. The results indicate that although the two groups differed significantly on only two of the five variables, a greater percentage of non-fishers responded correctly to all five items. This
suggests that non-fishers have a higher level of knowledge regarding whether there are separate regulations for territorial and federal waters as well as regarding which individuals or groups are responsible for making those regulations.\textsuperscript{40}

The two groups also differed significantly (Wilcoxon-Mann-Whitney two-sample rank-sum test, $U = 601, p = .036$) in their responses to the following Likert scale question: “How knowledgeable are you regarding the federal fisheries management process?” Figure 15 shows the two groups’ responses, indicating that while 74.5 percent of fishers responded with either a 1 (“I don’t know anything”) or a 2 (“I know a little”), non-fishers’ responses were spread out much more evenly across all five options.

Table 14. Results of tests comparing fishers and non-fishers on fisheries management knowledge variables using Pearson’s chi-square test. 1=Test violated assumptions, so results may not be meaningful. *=significant to the .05 level.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fishers (% correct)</th>
<th>Non-fishers (% correct)</th>
<th>Test Statistic</th>
<th>Sig. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Were aware that there are separate regulations for territorial and federal waters</td>
<td>63.5</td>
<td>81.8</td>
<td>$X^2(2, n=85)=3.319$</td>
<td>$p = .190$</td>
</tr>
<tr>
<td>Were aware that territorial regulations are made locally</td>
<td>71.2</td>
<td>81.8</td>
<td>$X^2(1, n=85)=1.234$</td>
<td>$p = .267$</td>
</tr>
<tr>
<td>Were aware that territorial regulations are made by FAC and DPNR Commissioner</td>
<td>7.7</td>
<td>27.3</td>
<td>$X^2(1, n=85)=5.975$</td>
<td>$p = .015 *$</td>
</tr>
<tr>
<td>Were aware that federal regulations are made by federal regulatory bodies</td>
<td>51.9</td>
<td>80.0</td>
<td>$X^2(1, n=87)=7.092$</td>
<td>$p = .008 *$</td>
</tr>
<tr>
<td>Were aware that federal regulations are made by CFMC</td>
<td>25.0</td>
<td>34.3</td>
<td>$X^2(1, n=87)=.881$</td>
<td>$p = .348$</td>
</tr>
</tbody>
</table>

\textsuperscript{40} It is important to note, however, that participants’ responses are an indication of their reported knowledge, as opposed to their actual knowledge, and the results presented here should be considered as such.
Discussion

As described above, although fishers and non-fishers differed significantly on only two of the five variables included in Table 14, a greater percentage of non-fishers responded correctly to all five items, suggesting they hold a higher level of knowledge overall. It is possible this difference is simply a reflection of the sampling procedure used to select the participants in the two groups. For example, almost half (n = 16) of the non-fishers were selected because they held positions with the Department of Planning and Natural Resources (DPNR) or were members of the St. Croix Fisheries Advisory Committee (FAC). Individuals from both of these groups would be expected to be
knowledgeable regarding who was responsible for developing regulations. On the other hand, while a small number of the fishers interviewed were selected specifically because they were involved in the fisheries management process, the majority of them were interviewed for no other reason than the fact that they are fishers, which does not require they hold a certain level of knowledge. In order to perform their occupation, fishing, they do not require a certain level of understanding or knowledge of fisheries regulations.

Based on my ethnographic research, I suggest one of the main reasons for this is the lack of enforcement in St. Croix. During an interview with a fisher who frequently attends meetings and is highly involved in the management process at both the territorial and federal levels, he explained this relationship:

*Most fishermen don’t even know what the laws are. They don’t care. I see them selling undersized fish, or they bring in lobsters that are berried [bearing eggs]. Well, most of them know about the lobster, but they don’t know about the sizes. And there’s no reason why they need to, since no one will catch them anyway.*

If regulations regarding size limits, closed seasons, and prohibited species were effectively enforced, then fishers would essentially be required to hold a level of knowledge about the regulations in order to be successful. If they did not, they would constantly be caught, fined, and punished for breaking fishing laws. However, in St. Croix, the lack of enforcement means such a need for knowledge does not exist.

Additionally, the fact that the non-fishers generally held a higher level of knowledge than fishers could also reflect the fact that the non-fishers are more familiar with fisheries management in general, most of them having grown up in the continental United States (US) where fisheries regulations are more common. Most of them (80%) are white Continentals who grew up in states where commercial and recreational fishing
licenses were mandatory and generally accepted by fishers and the public. It is likely they were educated in the conservation ethic of the US and taught to believe in the importance of keeping the environment “pristine” and untouched by humans. As described in Chapter 7, this ethic suggests that in order to do this, resource extraction must be restricted and even prohibited. This opinion was expressed by a non-fisher who provided a public statement at a scoping meeting held by the CFMC about the ACLs. At this meeting, this individual suggested that a five-year moratorium on all reef fishing be put into effect in order for the stocks to be rebuilt. Comments like this lead commercial fishers to believe that this individual has no regard for the economic and social consequences such a moratorium would have on the fishers and the island’s residents who depend on reef fish for food. Additionally, commercial fishers who attend these meetings and hear comments like this take these opinions and generalize them to the entire white population who are involved with fisheries management (both territorial and federal) and any other environmental concerns. As a result, fishers do not trust anyone, even those working for the management agencies and who in no way support such a complete closure of the fisheries.

For the fishers, a greater percentage of whom were born in St. Croix and grew up on the island, the concept of fisheries regulations is relatively new. Although commercial fishers have been required to hold a commercial fishing license in the United States Virgin Islands (USVI) since 1974, the lack of enforcement of this (and every other) regulation meant that most fishers were not aware of many regulations until around 2001, when the moratorium on new commercial fishing licenses was implemented. Unlike the non-fishers, and as discussed in Chapter 7, the fishers have grown up in a society and
culture in which the marine environment and its resources were perceived as a resource available for human use and extraction. While many fishers indicate they believe fishing regulations need to be in place, they do not believe the white Continental “outsiders” who did not grow up on the island and who do not make a living by using the resource have the right to make those regulations. One fisher indicated, in reference to “the feds”:

You can’t manage from Washington. You can’t come down and pass blanket laws that are made without consideration of the particularities here. We are more qualified than that piece of paper. We have the knowledge and skills to know what to do.

In this way, the fishers’ lower level of knowledge indicated by these variables may reflect not only their lack of awareness and acceptance of the need for fisheries regulations in general, but also an intentional decision to resist this conservation ethic being imposed upon them by white outsiders. This is an example of how historical inequalities between groups due to ethnic or other demographic differences continue to impact how fishers and other stakeholders perceive current inequalities in the control of resource use and management today.

Regardless of whether or not they were commercial fishers, most participants were aware that there are separate fisheries regulations for territorial and federal waters. Although slightly more non-fishers (81.8%) than fishers (63.5%) knew there were separate regulations, this difference was not significant \[X^2 (2, n = 85) = 3.319, p = .190\] according to chi-square analysis. Both groups also generally knew that local regulations were made by a local agency (71.2% for fishers, 81.8% for non-fishers), but the two groups differed significantly in the percentage who knew the specific local bodies (the FAC and the DPNR Commissioner) responsible for developing the regulations. While only 7.7 percent of fishers knew this, 27.3 percent of non-fishers did, a difference found
to be significant $[X^2 (1, n = 85) = 5.975, p = .015]$. Again, this is likely to be a reflection of the fact that most of the non-fishers in the study are either on the FAC or hold positions where this type of knowledge is mandatory.

A chi-square test found a significant difference between fishers’ and non-fishers’ knowledge regarding who is responsible for making federal fisheries regulations $[X^2 (n = 87) = 7.092, p = .008]$. Fishers’ knowledge on this item was slightly lower than that for territorial regulations, as only about 50 percent knew a federal body was responsible. Non-fishers’ knowledge on this item was similar to their knowledge of territorial regulations, and again about 80 percent of non-fishers knew a federal body was responsible. When it came to participants’ knowledge regarding the fact that the CFMC is responsible for making regulations for federal waters, the difference between the groups was not significant $[X^2 (1, n = 87) = .881, p = .348]$, with 25 percent and 34.3 percent of fishers and non-fishers knowing this, respectively. These differences are likely to again reflect non-fishers’ knowledge as related to their jobs, but also indicate fishers feel they have less of a need to be aware of federal regulations and federal fisheries management than those of the territory. During semi-structured interviews, many fishers stated they felt this way because they usually fish within the three-mile territorial waters limit. For example, when asked who made the regulations for federal waters, one fisher replied:

*Nah... I don’t know. I only fish in local waters, so I don’t need to know that.*

Another said:

*The feds make those regs. That’s all I know. Doesn’t really apply to us here since we fish mainly for reef fish.*
These sentiments also contribute to fishers’ feelings that there is no reason for them to attend federal fisheries management meetings, which will be discussed in the next section.

As described above, the two groups differed significantly in their responses to the question: “How knowledgeable are you regarding the federal fisheries management process?” Most of the fishers responded with either a 1 (“I don’t know anything”) or a 2 (“I know a little”), while non-fishers’ responses were spread out much more evenly across all five options (see Figure 15). Many fishers offered explanations for their responses to this item. For some, their self-reported lack of knowledge reflects an intentional dismissal of federal fisheries management. One fisher chose a response of 1 and stated:

I don’t know anything about that. They just want to close us down, don’t care about us. So I don’t pay attention and just go fishing. That’s all I care about, that’s how I pay my bills.

For other fishers, however, this lack of knowledge reflected the fact that they found the federal management process to be complex and complicated. For example, one fisher who has held a commercial fishing license in St. Croix for over 36 years and who often attends CFMC meetings explained his response of “I know a little”:

I don’t understand what they’re doing at those meetings. I’ve been to a bunch of ’em and they don’t make sense to me. That’s why I don’t talk. I let those other guys talk ’cause they know better what’s going on.

Another fisher stated:

I’ve tried to follow it. I went to meetings, I read their reports, but I can’t follow them. It just seems to me they want to shut us down.

Other fishers echoed these feelings that the information usually presented by the CFMC and NMFS scientists at public hearings and other regulatory meetings is too complex for
them to understand, which accounts directly for their lack of knowledge. This is not to say that the fishers do not have the ability to understand what is being presented to them; On the contrary, it speaks to the complexity of the council process and of the information presented in council presentations and documents, which is not unique to the CFMC and has been described in reference to other US regions (Eagle, et al. 2003). I will return to this point later in the chapter in the discussion regarding how fishers participate in the council process.

Participation in the Federal Fisheries Management Process

Results from Semi-Structured Interviews

Fishers and non-fishers were also compared on their responses to a series of questions that indicated the extent to which they participated in the federal fisheries management process (see Table 15). These questions addressed whether or not interviewees participated in the process via the main mechanisms the council system has established for that purpose: by attending council meetings, speaking during public comment periods at council meetings, and submitting written comments to the council. Because this dissertation is an examination of the “formal” federal fisheries management process (in the sense of how it is mandated to be carried out), I chose to examine the extent to which the fishers and non-fishers participated via these formal mechanisms. Interviewees were asked if they had participated via each mechanism regarding the recent CFMC meetings to address the development and implementation of ACLs as well as CFMC meetings that addressed any other items in the past. Analyses did not find that the two groups differed significantly regarding any of the variables, and the primary way all respondents participated in the process was by attending meetings.
Table 15. Percent of fishers and non-fishers participating in the federal fisheries management process. “—” = no test statistic produced by that test. Different tests used due to small sample sizes.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fishers (% yes)</th>
<th>Non-fishers (% yes)</th>
<th>Test Used</th>
<th>Test Statistic</th>
<th>Sig. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attended CFMC meetings about ACLs</td>
<td>51.9</td>
<td>32.3</td>
<td>chi-square</td>
<td>X²(1, n=83)=3.040</td>
<td>p=.081</td>
</tr>
<tr>
<td>Spoken at CFMC meetings about ACLs</td>
<td>17.3</td>
<td>12.9</td>
<td>Fisher's exact</td>
<td>-----</td>
<td>p=.758</td>
</tr>
<tr>
<td>Submitted written comments to CFMC about ACLs</td>
<td>3.8</td>
<td>9.7</td>
<td>Fisher's exact</td>
<td>-----</td>
<td>p=.357</td>
</tr>
<tr>
<td>Attended past CFMC meetings</td>
<td>54.9</td>
<td>43.8</td>
<td>chi-square</td>
<td>X²(1, n=83)=.978</td>
<td>p=.323</td>
</tr>
<tr>
<td>Spoken at past CFMC meetings</td>
<td>25.0</td>
<td>18.8</td>
<td>chi-square</td>
<td>X²(1, n=84)=.442</td>
<td>p=.506</td>
</tr>
<tr>
<td>Sent written comments to CFMC in past</td>
<td>1.9</td>
<td>3.3</td>
<td>Fisher's exact</td>
<td>-----</td>
<td>p=1.000</td>
</tr>
</tbody>
</table>

Discussion

The data indicate that the most common method of participation for fishers and non-fishers is meeting attendance. Slightly more than half (51.9%) of the fishers interviewed had attended a CFMC meeting about the ACLs, and 54.9 percent had attended a CFMC meeting in the past. The results were lower for the non-fishers interviewed. Only 32.3 percent of the non-fishers attended a CFMC meeting about the ACLs and only 43.8 percent had attended a meeting in the past. It is important to note, however, that these percentages reflect the number of respondents who have ever attended a CFMC meeting, even if it was only once. They do not reflect the percentage of respondents who attend these meetings regularly, and observation at 10 CFMC meetings indicates there are only three commercial fishers who do. There are only a few non-fishers (DPNR employees and FAC members) who consistently attend these
meetings as well, and no dive shop owners, charter boat fishers, or marine business owners attend regularly. This has important implications for fisheries management in that the perspectives and opinions of all stakeholder groups are not being provided to the CFMC on a regular basis, compromising its ability to make well-informed decisions.

Generally, the fishers and non-fishers interviewed who had attended a CFMC meeting about the ACLs or about other issues in the past stated attending meetings was a way for them to know what was going on with fisheries management, but without having to be “too involved.” As one fisher explained:

*I like to go so that I know what’s going on. But I just sit there and listen. I don’t want to get up there in front of everyone and say something. I wouldn’t know what I was talking about anyway.*

Similarly, a non-fisher stated:

*I go sometimes to hear what they’re talking about, so that I know what they’re doing. But that’s all it is. I don’t want to say anything publicly.*

In other words, these participants appreciated that they could attend meetings and listen, but did not have to speak or interact in a public manner.

There were several reasons offered for why respondents did not participate at all in the federal fisheries management process. Several non-fishers specifically mentioned that their positions made it either inappropriate or undesirable to attend the meetings and participate. As one individual explained, his job requires cooperation from fishers, and he purposely does not attend meetings so that the fishers do not see him as aligned with federal government representatives.

*I don’t go to meetings because I need to stay friendly with the fishermen. I can’t do that if they see me at meetings and view me as one of “them.” It’s also not part of my job.*
Other territorial government employees indicated they have not attended meetings because they were specifically advised by their superiors not to attend or to speak. Often, these gag orders stemmed from the controversial nature of what was being discussed as well as the political nature of the appointed positions within territorial agencies and this type of incident was reported three times in this study.

Other non-fishers stated they do not attend or speak at meetings because they do not want to get involved in such controversial issues, citing cases where individuals have been threatened by fishers for supporting the passing of certain regulations. For example, when the FAC was considering banning gill and trammel nets, body and personal property threats were rumored to have been made by other fishers against those voting fishers. While none of these threats were followed through with (to my knowledge), their mere suggestion was enough to deter fishers and non-fishers alike from being openly involved in these issues. As one dive master and captain stated:

_I have no desire to voice my opinions and get involved. I’m not a political person. I don’t want to get involved and deal with threats and everything else. Why should I put me and my family in danger when ultimately they’re still going to be able to do whatever they want regardless of the laws?_

While it is certainly a valid concern to not want to become involved in a controversial issue, participant observation and informal interviews suggest this and other similar comments made by non-fishers (typically white Continentals) reflect the racism and classism that exists on the island.

Other non-fishers indicated that they no longer attend fisheries meetings—whether territorial or federal—since the net ban was passed. Although the gill net ban was a territorial waters issue, interviewees’ experiences with and participation in that
process impacted the extent to which they currently participate in and perceive the management process. This is particularly the case for the dive shop owners and managers I interviewed. The campaign to get the gill net banned was something that unified the island’s dive shop owners, a group whose relationships are usually characterized by cordiality but competitiveness. The group banded together in order to show fisheries managers and politicians that the dive industry was unified for this purpose. Although the campaign was eventually successful, the lengthy and political process led many of them to have negative opinions of fisheries management and ultimately discouraged them from participating again. As one dive shop owner indicated:

*The whole thing was just so political. It wasn’t at all about what was best for the environment, for the reefs. It was just about what was best for getting the votes.*

The overlap of environmental decisions with political concerns is certainly not unique to St. Croix, but what has compounded the feelings of frustration are the lack of transparency with which the buy-back program (discussed in Chapter 7) was implemented and the lack of enforcement of the ban that has followed. The two-year lag-time between when DPNR received the buy-back funds in 2006 to the enforcement of the ban and the implementation of the buy-back program in 2008 led to accusations against DPNR officials regarding the use of the money. This further deflated non-fishers’ faith in local fisheries management, even in instances where the federal government steps in with assistance (providing the money for the buy-back in this case). Finally, the metaphorical “nail in the coffin” is the fact that some fishers are still using gill and trammel nets with no negative repercussions. As one dive shop owner described:

*So we spent all this time and energy trying to get this ban in place... and it finally works, which is great. But here we are, two years later, and I still*
see guys out there fishing with nets. We call Enforcement and either no one answers, or they don’t have a working boat, or all their officers are off doing something else. And even the guys who have been caught always get off! On some technicality, or the judge throws it out... so what’s the point? Why should we bother? Considering it doesn’t really matter what’s on the books...

Other non-fishers who helped to get nets banned are not quite as pessimistic about the results of their efforts, and indicated that although there are still some fishers who continue to fish with nets, the ban has generally reduced the use of nets overall. Another dive shop owner stated:

We’re starting to see some of the reef fish come back, the parrotfish... I’m seeing more at the dive sites we go to. But it’s still frustrating that anyone’s getting away with it at all... So I don’t know... I just feel like why should I even pay attention to what’s going on when these guys still do whatever the hell they want?

Similar opinions were expressed by dive industry employees, making it clear that even though the net ban has had at least a small amount of success in reducing fishers’ use of nets, their experience with the management process overall has ultimately resulted in feelings that the process is ineffective and that DPNR officials (especially the Division of Enforcement) are incompetent.

Both fishers and non-fishers also indicated they did not attend or speak at meetings because they knew others were representing their interests. For example, one dive shop owner stated:

I’ve been to a couple meetings over the past ten years or so, but I honestly don’t feel the need to go when I know ________ is going and giving our side of the story. That leaves me to concentrate on other things, like getting St. Croix out there in the dive tourism industry.

Similar sentiments were echoed by other respondents from the dive industry. Although the fact that only one person usually represents all five dive shops on the island raises
issues of representation, in the case of St. Croix, ethnographic data suggested it was not an issue. The main concern of all the dive shops was just that at least someone was there to advocate for conservation measures. The larger issue was that even this individual rarely attended federal management meetings or submitted comments to the CFMC, and as a result, the dive shops’ perspective was rarely and inconsistently presented to federal managers.

Fishers also responded that they did not feel the need to attend fisheries meetings because they knew other fishers were very involved and would be representing their interests. When asked why they did not attend meetings, several fishers mentioned other fishers by name, indicating they knew these individuals always went to meetings and spoke on their behalf. They felt, therefore, that there was no reason for them to spend any time or effort understanding proposed regulations or participating in the management process. As one fisher explained:

I know _________ and _________ are doing a good job for us. They tell ’em like it is and I’ve seen them do it. There’s no need for me to take the time to go to these meetings, too. I have to fish to pay my bills.

While this indicates a certain level of trust and respect this fisher has for the fishers who are involved in the management process, it also causes feelings of resentment between those who participate and those who do not, which will be discussed further in Chapter 9.

Several fishers also indicated they did not attend CFMC meetings because they felt “the feds… already have their minds made up” before they come to the islands to hold meetings. They felt that holding the public scoping meetings and allowing for public comment at general CFMC meetings is just a formality, and that the comments
made are not taken into consideration as fishery management plans are modified or new regulations are developed. As one fisher said:

No, it doesn’t matter what we say. They already know what they’re gonna do before they get down here. They don’t care about what happens to us. Or, we tell them where the fish are to show that they’re not all gone, and the next thing we know that place is closed. That’s what happened to __________. So, we just don’t go anymore. Why should I waste my time? I need to fish.

Similar responses were provided by fishers again and again. Another fisher commented:

I used to go to their meetings... and tell them what we thought. But all they do is close close close. They don’t care how it affects us or whether we can still make a living. They know what they want before they get here. So I just stopped paying attention.

These comments not only tell us why fishers choose not to attend CFMC meetings, but also indicate how fishers judge whether or not their opinions and testimonies are taken into consideration by the CFMC. These points have important implications regarding the participatory nature of the federal fishery management council process. Although the process is described and promoted by NMFS and council staff as a “shining example of true, participatory democracy” (NMFS and Councils 2003:23), fishers in St. Croix do not experience it as such. Often, the complexity of the topics discussed contributes to the discomfort of the fishers to engage in “on the record” conversations about those topics. Additionally, those who do provide comments do not feel they are taken into consideration. The result is a system in which both fishers and non-fishers perceive they have no influence.

Several non-fishers indicated they opted not to attend meetings and participate because of the lack of accurate and usable data, as discussed in Chapters 5 and 7.
Representatives from local environmental NGOs (ENGOs) described how the lack of data helps determine where and when they focus their efforts. One individual described:

_Just like everyone else, we have limited funding and time. So we put our time and energy toward things we know we can make a difference in. There’s either no data to use for fisheries management, or it’s based on their catch reports, which everyone knows is useless. Fish and Wildlife doesn’t have the capacity to change that. And without enforcement, none of that matters anyway. So, we focus on things we think can help make a difference, like educating the kids on the island about environmental issues, or ensuring new industries coming in comply with environmental regulations._

Other non-fishers with scientific expertise who did not work for DPNR echoed similar sentiments. They felt that due to the lack of data, management decisions currently being made at both the territorial and federal levels were of a political nature and not based on sound scientific information. Many indicated that unless that changed, they were not inclined to become more involved. This points to the fact that the centralized nature of US federal fisheries management, which mandates the CFMC use management strategies for which they do not have the necessary data, actually decreases the likelihood of stakeholder participation.

Despite feeling that their participation does not affect the federal fisheries management process, some fishers persist in their efforts to influence the decisions that are made. For example, one individual has been fishing commercially in St. Croix for over 40 years. He has also been involved in the fisheries management process—for both territorial and federal waters—throughout that time period as well. He attends the CFMC public scoping meetings and general council meetings when they are in St. Croix, he writes letters to the CFMC, he has drawn up petitions regarding certain laws, and has met with island senators and other residents in order to acquire support and gather signatures.
During my interview with him, I asked him if he felt that all his efforts made a difference. Having “been around the block” with fisheries management in the USVI for many years, and having seen many researchers from the mainland come and go, not always with the best intentions, he did not trust me completely. For this reason, he avoided the question and instead told me to stop by his house later in the week because he had some papers to show me. What he showed me were several folders full of over 40-years’-worth of documents related to USVI fisheries management. There were petitions, letters of support from senators who are no longer even in office, and several drafts of letters to the CFMC addressing a variety of issues. Most striking to me was a series of letters this fisher had submitted to the CFMC over the past 30 years, describing the distinctions in the fishable area between St. Thomas-St. John and St. Croix, and advocating for separate regulations for each area. Remarkably, it is only in the past year with the discussions regarding the ACLs that this suggestion is being considered by the CFMC, and only because it has been recommended by NMFS scientists. In light of this, although he does not say that he does not think his participation makes a difference, the documents provide evidence that either the CFMC did not take his comment into consideration or that they were constrained by other mandates and were unable to address them.

Though they have not been involved for quite as long, there are a small number of other fishers who consistently participate in the federal fisheries management process by attending meetings, speaking, and by generally acting as liaisons between the commercial fishers and the CFMC. These men consistently shared their frustrations with me, and quite often told me they were no longer going to participate because they were too discouraged by all the regulations being passed. However, they never quite gave up and
continued to attend the meetings and participate. When I asked one fisher why he continues to go even though he does not think it makes a difference, he responded:

*Because I have to see what’s going on. We have to fight for our lives. If I don’t go, no one else will.*

Another fisher explained why he attends and speaks at meetings:

*So they can understand fishing in the USVI is different than other places in the US. It’s unique—small vessels, multi-species, we catch for the day only, we don’t export.*

When I asked another fisher why he still goes to meetings even though he does not think the CFMC takes what he says into consideration, he looked at me, laughed, and said:

*I’d hate to think what they would do if I wasn’t there.*

Inherent in each of these responses are the perceptions that not only do the CFMC and “the feds” not understand St. Croix’s fisheries, but that unless the fishers are there to “fight for their lives,” more and more regulations will be put in place.

Semi-structured interview data presented here suggest there are many reasons why fishers and non-fishers choose to participate (or not participate) in the federal fisheries management process via the mechanisms the council system has established. The lack of participation of certain stakeholder groups has ramifications for management in that not all perspectives and opinions are available to CFMC members and considered when management decisions are made. As Chapter 2 discussed, it is also important to examine how stakeholders participate in management processes as well as the extent to which they are able to influence management decisions. This topic is discussed next.
How Fishers and Non-Fishers Participate

Results from Participant Observation at Meetings

Participant observation at 15 CFMC public hearings, information meetings, and general council meetings allowed me to observe how the fishers and non-fishers participate. While there are rarely more than 10 fishers at any given meeting, the fishers that participate do not do so in the manner in which the CFMC and the federal government would like. In other words, as described in Chapter 5, the federal fishery management council system allows for public participation through scoping meetings and by accepting written statements regarding proposed regulatory actions. Toward this end, they encourage meeting attendees to testify “on the record” by first stating which particular amendment or regulatory action they are referring to, then describing which of the proposed alternatives they support or do not support and why. In participants’ statements, the CFMC is looking for the particular reasons and information to support their opinions. To encourage this kind of participation, the council system has funded social scientists to develop guides that help explain the process and keys to “successful” participation in laymen’s terms (McCay and Creed 1999).

At all CFMC meetings I attended that were open for public comment, almost all fishers who testified did not do so in the manner preferred by the CFMC. Instead, they spoke more generally about the unfairness of fisheries regulations. They often focused on regulations that have already been passed, in some cases referring to decisions that were made many years ago. Additionally, they often discussed their discontent over regulations that were passed at the territorial level, which are not under the jurisdiction of the CFMC. In most cases, it was clear they had not read or even looked at the documents.
that were provided in advance by the CFMC, and so were not aware of the topic the meeting had been organized to address. The statements were often very emotional, and the fishers’ tones were heated, indicating their anger over fisheries regulations in general. In a few cases, the fishers’ comments and behaviors became antagonistic, even to the point of waging personal verbal attacks on members of the CFMC or DPNR that had nothing to do with the items on the agenda.

Additionally, observations at CFMC meetings allowed me to see who, other than commercial fishers, spoke at meetings and what type of comments they made. In contrast to the fishers, the non-fishers who commented—these were often local politicians or politicians’ representatives—were much more formal in the manner of their statements. However, even the politicians or representatives from local political offices did not address the particular items on the agenda or offer recommendations regarding the proposed regulatory actions. Instead, they often made very general statements regarding their support for the local fishers. On the rare occasions that other non-fishers testified, such as members of the FAC, they frequently referred to the particular actions that were supposed to be addressed and provided recommendations on how they can be improved.

Discussion

Several points must be made regarding the manner in which members of these groups testify. First and foremost, as has been stated by others regarding other fishery management councils (Eagle, et al. 2003), the documents that are provided by the CFMC to the public are often written in a highly technical manner that is very difficult to understand. In many cases, the documents that were provided at the meetings were difficult for even trained scientists (non-fisheries scientists, such as myself) to
understand. Additionally, many of the presentations that were given by the CFMC or 
federal scientists at these meetings were presented in a similar manner. If these materials 
are difficult for highly-educated, English-speaking scientists to understand, it is 
reasonable to assume that fishers who speak Spanish as their primary language and who 
have received only a little high school education would have a hard time understanding 
the information being presented to them. Although there are usually question-and-answer 
periods provided during the meetings after the presentations, very few questions are 
asked by fishers or anyone else. One of the few fishers who is involved in both territorial 
and federal fisheries management explained that many fishers are too embarrassed to ask 
questions, and so they just remain silent without really understanding what is being 
discussed. With the information they need to participate effectively being available to 
them only in inaccessible terms, and them unwilling to ask questions to the CFMC and 
federal scientists, they end up testifying in the only way they know how—by speaking 
frankly as fishers about how they feel the regulations are negatively affecting their 
livelihoods in a generalized manner.

As a result of these generalized testimonies that do not provide constructive 
feedback regarding specific proposed regulations, the CFMC often has very little 
information about how the specific alternatives of the proposed amendments would likely 
impact the fishers and the island’s communities. Moreover, when the most common 
suggestion offered by the fishers is to do away with all regulations (which is not even 
legally possible), it is understandable why the fishers feel that the CFMC does not taken 
their opinions into consideration. Several CFMC voting members and staff stated this 
was a concern for them. All past or present CFMC members who were interviewed (n=8)
indicated quite emphatically that they take very careful consideration of the public comments provided by all individuals when developing regulations and when voting. However, as one scientist noted:

*Fishermen should definitely be involved* [in the management process]. *They are the main resource users—it’s in their best interest to participate. And their knowledge is invaluable. I always like to start with what the fishermen say and try to prove it scientifically... We do a good job of listening, what people request, we look into it. But there’s lots of things that come into it—politics, local issues—that are well out of the CFMC’s purview. A lot of times they fishermen don’t speak to the points either. They talk about things that are local and have nothing to do with the federal side, or things that happened many years ago.*

Other CFMC staff and voting members voiced similar frustrations, suggesting they face great difficulty in developing regulations that take stakeholders’—especially fishers’—concerns into consideration when they receive little constructive feedback that indicates what those concerns are.

Although the percentages for both groups were very low, more non-fishers than fishers indicated that they have participated in the fisheries management process by sending in written comments to the CFMC (see Table 15). Informal conversations with these individuals and participant observation indicate it is likely they felt more comfortable sharing their opinions with the CFMC in this way, as opposed to speaking publicly at the meetings. As discussed earlier in the chapter, several non-fishers indicated they chose not to be involved in fisheries management because the issues are highly contentious, and they are concerned they will be threatened or harassed by fishers if they speak out in favor of a regulation the fishers are against. Therefore, submitting their comments in writing allows them to share their opinions and offer suggestions without exposing themselves to the fishers’ scrutiny. The fishers, on the other hand, view
this kind of participation as sneaky. The few fishers who were involved in the
management process on a regular basis indicated this was extremely frustrating to them,
because they felt that what it really came down to was money. They felt that the ENGOs
and conservationist groups have the power and money to send in written comments,
threaten to sue NMFS or the CFMC over a particular issue, and the regulations are
automatically catered toward them. The fishers feel that without having the money to
hire a lawyer and threaten to sue, they lack power over the process.

Beliefs About Fisheries Management: Should USVI Fisheries be Managed?

Results from Semi-Structured Interviews

Participants were also asked several questions regarding their beliefs about
fisheries management. These are important to include in a discussion about participation,
because (as discussed in Chapter 7) in St. Croix, the perspectives and beliefs individuals
hold regarding their environment, fisheries, and the use of natural resources are
influenced by factors such as ethnicity, education level, and the location in which they
were born and raised. These perceptions and beliefs, then, can influence how they
perceive and interact with management processes. Table 16 shows that fishers and non-
fishers differed significantly in their responses to whether or not they believed St. Croix’s
commercial and recreational/sport fisheries should be managed. While all non-fishers
(100%) believed both commercial as well as recreational and sport fisheries needed to be
managed, a significantly smaller percentage of fishers believed they needed to be
managed (77.1% for commercial, 52% for recreational/sport).
Table 16. Fishers’ and non-fishers’ responses to whether they believed USVI fisheries should be managed. **=significant to the .005 level.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fishers (% yes)</th>
<th>Non-fishers (% yes)</th>
<th>Sig. Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you believe USVI commercial fisheries should be managed?</td>
<td>77.1</td>
<td>100.0</td>
<td>$p = .002$ **</td>
</tr>
<tr>
<td>Do you believe USVI recreational and sport fisheries should be managed?</td>
<td>52.0</td>
<td>100.0</td>
<td>$p &lt; .001$ **</td>
</tr>
</tbody>
</table>

Many of the reasons offered by both fishers and non-fishers for why commercial fisheries should be managed were similar. Participants from both groups indicated they felt commercial regulations were needed to prevent people from taking as much of the fisheries resources they want in whatever manner they want. Many fishers responded in a similar manner, offering various forms of the statement:

[We need regulations] *because of greed*. *Without them, guys will take it all.*

Similarly, a non-fisher indicated:

[We need regulations] *because it’s a free-for-all out there. If we don’t manage them, there’ll be nothing left.*

Both of these comments reflect the perceptions that without regulations, the commercial fisheries in St. Croix will suffer from the “tragedy of the commons,” with each fisher motivated to take as much as he can because if he does not, it will be taken by someone else. Although, as discussed in Chapter 2, a great deal of research since the 1980s indicates that the “tragedy of the commons” is not an inevitability, ethnographic data collected during my fieldwork suggests that the lack of organization of the fishers in St. Croix prevents them from coming together informally as a group and developing patterns of sustainable use and management. Moreover, this lack of organization also keeps them
from influencing management decisions formally through the CFMC because there is little motivation for fishers to participate in the CFMC process due to the lack of enforcement and high dependence on territorial waters as fishing grounds. A more in-depth discussion of the organization of the fishers is included in Chapter 9.

Additionally, both fishers and non-fishers indicated the need for commercial regulations to ensure the long-term sustainability of the fisheries resources. These responses are closely linked to those mentioned above, but not only indicate the perception that without regulations, the fishers will take as much of the resource as they can as soon as they can. These responses go one step further, describing why it is important to limit the catch today so that there will still be fish to catch in the future. As one dive shop owner stated:

\[\text{We need the regs so that commercial fishers can maintain their industry for future generations.}\]

Several fishers made similar comments regarding the need to conserve their industry for the future.

One difference between fishers and non-fishers regarding their responses for why commercial fisheries should be regulated is that several non-fishers rationalized the need by comparing the current state of the fisheries to that in the past. These participants stated that the number and size of fish are much depleted from years in the past. As one local marine business owner and ex-commercial fisher described:

\[\text{[We need regulations] because we’ve depleted the fishery so much, some appear to be in danger of collapse. We can’t fish the same way I did 20 or 30 years ago.}\]
Dive shop owners and local scientists also made similar statements, describing how they no longer see the large-bodied fish they once did, and that some species (such as Nassau grouper) are only rarely seen now.

The main reason provided by fishers for why they did not think commercial fisheries should be managed reflected their belief that no one has a right to regulate and control the manner in and extent to which fisheries resources are used. Several fishers provided the exact same statement:

*Because they can’t tell us what to do.*

For many fishers, this reflected a generalized “us” versus “them” mentality, where “them” primarily represented anyone involved with fisheries regulations at the territorial or federal levels and, as explained in earlier chapters, is connected to historical patterns of social inequalities based on ethnicity. Others offered a more particular reason for why no one had a right to regulate the resource, and it stemmed from their religious beliefs. One fisher described:

*They can’t tell us what to do. It’s our resource. God put it there for us to use.*

Although similar sentiments were only provided by a few other fishers in response to this question during semi-structured interviews, informal conversations with fishers indicate that this is a belief held by many fishers.

Regarding recreational fishing, 100 percent of non-fishers indicated they thought recreational and sport fisheries should be managed as well. They indicated they felt this way because recreational and sport fishers also have an impact on the fish stocks, and because there are currently no recreational licenses or regulations, we have no way of knowing the extent of that impact. While some of the non-fishers interviewed indicated
they thought the recreational and sport fishers’ impact was less than that of the commercial fishers, they acknowledged that it is still important to place controls and limits on non-commercial fishing as well.

In comparison, only slightly more than half (52%) of the commercial fishers who were interviewed indicated they thought recreational and sport fisheries should be managed. The main reason they offered for believing this was different from those offered by the non-fishers, and focused on the sale of fish by non-commercial fishers. Often this fish is sold at a lower price than the commercial fishers sell their catch, which undermines the commercial market. To combat this, some commercial fishers feel that a recreational license should be established, and that regulations be set that limit the allowed catch of recreational fishers. Having both commercial and recreational licenses would create a clear division between commercial and recreational fishers’ catch which, as indicated by DEE officers and discussed in Chapter 5, would make the corresponding regulations much easier to enforce.

The other main reason fishers felt that recreational and sport fisheries need to be managed has to do with the charter boat fishers (who for the purposes of this dissertation are included as sport fishers). There are a few charter boat captains who also impact the commercial market by selling the fish they catch on charter trips. Most of the customers who take charter trips in St. Croix are tourists and visitors to the island, and as such, they often do not have anywhere to refrigerate the fish they catch on the trip. Usually, the customers will take enough for one meal, and the rest of the catch stays with the captain. There are a few charter boat captains who also have commercial licenses, so they are legally allowed to sell their catch, and they often sell to restaurants for a lower price than
that offered by the commercial fishers. While this is not illegal, many commercial fishers feel that it should not be allowed. As one fisher indicated:

*The charter guys need to be regulated because they’re selling their fish now too, and everyone wants to buy from them since they’re selling for less, even though they already make money by taking people out. It’s not fair. They shouldn’t be allowed to do it.*

Other commercial fishers who were interviewed indicated this was one of the main issues they are currently facing, and that a regulation should be put in place to prevent charter boats from selling fish caught during charter trips.

Additionally, many fishers indicated they held more general beliefs for why recreational and sport fisheries should not be regulated. These interviewees responded to the question by referring to recreational fishers who do not sell their catch and only fish for personal consumption, or for hobby or sport. These comments focused on the recreational fishers’ intention; Meaning that if a father wants to take his son to the Frederiksted Pier to fish for fun, he should not have to worry about getting a license and being aware of fishing regulations. Or, if someone wants to catch a few fish for his family’s dinner, he should be able to do so whenever and where-ever he wants. Several fishers who responded this way also mentioned that people have been fishing recreationally without being regulated in St. Croix for years. They see it as a cultural tradition, as evidence of the close connection between the people of St. Croix and the ocean, and feel they should not be subject to regulations now. These beliefs are supported by the data presented and discussions included in Chapter 6.
Beliefs About Fisheries Management: Should ACLs be Implemented?

Results from Semi-Structured Interviews

In order to ground participants’ responses in a concrete regulatory example, I asked a few questions during semi-structured interviews about their beliefs regarding the implementation of ACLs. Fishers and non-fishers differed significantly in terms of the extent to which they supported the implementation of ACLs (Wilcoxon-Mann-Whitney two-sample rank-sum test, $U=158, p < .001$) (see Figure 16). Almost half (47.7%) of the fishers did not agree (responded with “strongly disagree” or “disagree”) that ACLs should be implemented, 38.6 percent indicated they were “neutral” on the matter, and only 13.7 percent agreed (responded with “agree” or “strongly agree”) they should be implemented. Non-fishers, on the other hand, greatly supported the implementation of ACLs, with 72 percent agreeing, 24 percent being “neutral,” and only four percent disagreeing with their implementation.

![Figure 16. Extent to which fishers and non-fishers agreed with the implementation of ACLs.](chart.png)
Semi-structured interview data suggest the non-fishers were more supportive of implementing the ACLs simply because they were another regulation to put in place. Their overall feelings are that there are not enough regulations in place, so they should add anything being proposed. As one dive shop owner stated:

*Sure, let’s add ‘em. Why not? It seems like a free-for-all out there right now! Something’s gotta work one of these days.*

Other non-fishers offered similar comments, and although these non-fishers were aware of the ACLs, they were not aware of the specifics of the regulation or the difficulties involved with setting limits on catch without sufficient data. Interestingly, many individuals who indicated the need for more regulations, such as ACLs, also discussed the severe lack of enforcement that exists regarding the current regulations during the interviews. However, few made the connection that unless enforcement is made more effective, adding another regulation will not solve the problem.

The responses of those non-fishers who indicated that they were neutral about or disagreed with the implementation of ACLs often discussed the technicalities of developing such regulations, such as the lack of data available in the USVI. One DPNR employee indicated:

*They’re one tool that can be used, but it really depends on what the limits are being based on. It’s not just about sustaining the catch of one species, but we need to look at the whole ecosystem.*

Another non-fisher interviewee, who works for a local NGO stated:

*I guess I support them. But it’s not a “be all or end all” kind of thing. There are other management strategies that they should be trying as well.*

Both of these comments highlight the incongruency that exists between the management strategies Congress mandates the CFMC use to manage fisheries and the many other
management strategies that could be used and are perhaps better-suited to manage fisheries in St. Croix. As discussed in Chapter 5, even CFMC and top-level NMFS administrators do not believe that ACLs are an appropriate management strategy for fisheries in St. Croix (and the US Caribbean in general). However, because their use is mandated by Congress, the CFMC and NMFS has to move forward with ACL implementation despite the challenges posed by the lack of data.

The fishers who were interviewed were mainly not in favor of the implementation of the ACLs (47.7%) or responded that they were neutral (38.6%). As with the non-fishers, most of these responses were based on only a basic understanding of the ACLs, evidenced by comments such as:

What? More regulations? No I don’t support that. We don’t want any more regulations!

Or, as another fisher stated:

You know? I don’t even know the specifics of that and I know we don’t need ‘em. All they doing is trying to control us.

These comments reflect not only the fishers’ aversion to ACLs specifically, but also to any fishing regulations currently in place or being proposed.

Beliefs About Fisheries Management: Who Should be Responsible?

Results from Semi-Structured Interviews

Participants were also asked who they thought should be responsible for USVI fisheries management, and chi-square analysis indicated the two groups differed
significant in their responses $[X^2 (4, n = 75) = 16.908, p = .002]$.\footnote{Violations for chi-square analysis occurred because three cells had expected values less than 5.} Figure 17 shows that almost 80 percent (78.57%) of non-fishers felt that either the local government or the federal government should be responsible for USVI fisheries management. Most of the fishers felt they themselves (31.91%), the local government (25.53%), or a cooperative arrangement between the fishers and the local government (19.15%) should be responsible for management. It is not surprising that almost 80 percent of the non-fishers interviewed thought that either the local or federal government should be responsible for fisheries management. Many of these individuals indicated during interviews that they did not believe the commercial fishers were willing or capable of managing themselves, and that
the fishers just want to take as much as they can with no regard for the future. However, more non-fishers thought the local government should be responsible as opposed to the federal government, indicating an opposition to federal control similar to that expressed by fishers (as mentioned earlier in the chapter). Moreover, several of the non-fishers who responded that they thought the federal government should be responsible were reluctant to do so, but indicated they felt it might be the only option since the local government has been unsuccessful. A charterboat captain who was interviewed described this:

*I’d love to say it should be DPNR, because no one wants the feds coming down here. But, they’re just not doing it. So, I guess it has to be the feds.*

Other non-fishers shared his reluctance, stressing they would prefer it was handled locally, but because they believed effective management and enforcement from the territorial government is unlikely, the federal government should take over the responsibility for both territorial and federal waters.

Additionally, non-fishers’ beliefs that some form of government (either local or federal) should be responsible for managing the fisheries also indicates a certain level of “buy-in” regarding the centralized fisheries management model. While this could reflect the local conditions in St. Croix, and these non-fishers’ perceptions of the local fishers’ ability to manage their resources, it could also reflect a more generalized acceptance of the top-down, centralized fisheries management model in which most of them were trained, as opposed to a management structure in which resource users are charged with resource management directly.

On the other hand, about a third of fishers indicated they thought St. Croix’s commercial fishers should be responsible for fisheries management. Most of these responses focused on the fact that they are the ones that use the resource, therefore they
should be the ones allowed to manage it. Some of these participants indicated specific fishers they thought should be the managers, while others believed all fishers should be involved. Other fishers indicated they thought the local government (25.53%), or a cooperative arrangement between the fishers and the local government (19.15%) should be responsible for fisheries management. Although these responses varied regarding the extent to which they felt the fishers should be involved (for example, as advisors to DPNR or as co-managers), their main point was that they were involved to some extent.

As one fisher indicated:

*It should be both DPNR and the fishermen. We have the knowledge about what’s going on out there, and they know the science and the school-book learning about how to manage the fish. We should work together.*

This statement indicates an understanding of the complexities of fisheries management, and that neither the fishers nor the scientists and managers have all the skills and information they need to manage the resources. It also shows an understanding of the need to work together, and willingness on the part of some fishers to do so.

**Contextualizing the Findings in the ACL Process**

**How Does the Structure of the Management System Affect Stakeholders’ Influence?**

In this section I examine how the structure of the fisheries management system in St. Croix—mainly the relationship between territorial and federal management—affects the extent to which the fishers and other stakeholders are able to influence management decisions. To contextualize this discussion, I use the ACL development process that occurred during my fieldwork to describe the lack of cooperation and tension that exists between the island’s fisheries scientists and managers and those from the federal government. While most of the data presented here come from semi-structured
interviews, I include data from observations at meetings and informal interviews where they are critical to the discussion.

One factor that contributes to the lack of cooperation and tension between the two management levels is the lack of attention the federal government in general, and NMFS in particular, has given to the US Caribbean region. Interviewees from several different groups, including CFMC staff, NMFS scientists, DPNR officials, and commercial fishers, all indicated that prior to the Congressional mandate for the ACLs, NMFS paid relatively little attention to the US Caribbean region. When asked why this was the case, one NMFS administrator replied:

Well, it’s all money and politics. You compare these fisheries here to the large-scale industrial fleets in Alaska or New England... who do you think the government’s gonna give the money to? These guys [in the Caribbean] don’t bring in any money.

This statement reflects NMFS history and placement within the US Department of Commerce. As described in Chapter 5, fisheries research and management in the US in the mid 1900s focused on developing the nation’s fisheries and maximizing economic profit. While the passing of the MSA in 1976 shifted the primary focus to the conservation of the nation’s fisheries resources, most of the federal government’s attention continues to rest with the larger scale fleets. In the words of one commercial fisher: “We’re small potatoes to them.” Fisheries catch data were collected through DPNR beginning in 1975, but NMFS paid little attention to the format of the data. Additionally, as indicated by a long-time NMFS scientist, although the data were passed on to NMFS, not much effort was made toward cleaning up the data and checking the quality. As a result, when the reauthorization of the MSA in 2006 called for all Regional
Fishery Management Councils to set ACLs, the CFMC and NMFS did not have sufficient data in the format they desired to help them set the ACLs.

When these data issues were brought to light at the beginning of the ACL development process, tension increased between DPNR and NMFS as each agency blamed the other for the lack of usable data. Participant observation, observation at public meetings, and informal and semi-structured interviews suggested that several DPNR employees and fishers interpreted NMFS scientists’ comments that the data were not sufficient to mean that none of the data could be used, and felt they were being blamed for the data problems. Additionally, they believed that the blame was misplaced because they felt it was NMFS’s job to check the quality of the data. This frustrated many DPNR employees and commercial fishers, as this statement from an interview with a long-time fisher suggests:

So now they saying they can’t even use the information we been turning in. We been doing that for years, and just now they say we’re doing it wrong? No… that’s not right… They can’t use our data in their programs? Well, maybe they should change their programs so they can use all our data we gave them!

This statement not only shows the fisher’s frustrations with NMFS dismissing the data he had provided for more than 30 years, but also touches upon feelings of who has the right to manage the island’s resources. Several other DPNR employees and fishers shared this fisher’s feeling that NMFS and the CFMC should be catering to them, and not the other way around. In other words, they feel that they are the island residents, the resources are theirs, so, in this example, NMFS scientists should find a way to use what is available to them.
Another factor that contributes to the tension and lack of cooperation between territorial and federal managers is the assumption that the territory will automatically adopt compatible regulations to those implemented in federal waters. Many Crucian DPNR employees and commercial fishers voiced frustration over this. In the case of the ACLs, this means that while technically the CFMC can only establish ACLs pertaining to federal waters, because Crucian fishers fish in both territorial and federal waters, they advise the territory to adopt compatible regulations that establishes one ACL that applies to both territorial and federal waters. This was discussed at FAC meetings, and both fisher and non-fisher members indicated their frustration over these expectations. On several occasions, the argument was made that at times in the past when the situation was reversed, the CFMC did not adopt the FAC’s recommendations. Again, this contributes to participants’ feelings about who has the right to manage the island’s fisheries and leaves them with little desire to cooperate.

As mentioned previously, many fishers and DPNR employees are reluctant to cooperate with and to share too much with visiting scientists (including NMFS scientists) because of prior experiences. On several occasions in the past, they worked with those scientists, who then left after they had conducted their research, without ever providing them with the results of the research or helping them implement the researchers’ recommendations. Similar sentiments are held toward “the feds,” as one DPNR employee explains:

_The feds are always coming down here, we help them out for a few weeks, then they’re gone. Then we get a report that says we need to do this and this and this, but nothing that tells us how to do it. Where do we get the money to do these things? But, they’re gone... it’s not on their head._
These behaviors are perceived as a lack of concern for the island’s fisheries, and a lack of understanding of the local conditions and the challenges DPNR faces on a regular basis.

Although this section focused on the ACL development process, there have been several occasions in which participants have had similar experiences regarding NMFS and the CFMC. The current structure of the management system, and the lack of a clear separation between territorial and federal management contributes to the perpetuation of these kinds of interactions. Fishers and territorial managers feel they have little influence over management decisions. DPNR is almost fully-funded by federal money, which means the federal government has some control (if not all) over what kinds of research projects and management strategies DPNR focuses on. In many cases, the funding sources do not match up with the kinds of funds that would be most useful and appropriate for the USVI, such as those that could be used for the enforcement of commercial fisheries regulations. On top of that, although most of St. Croix’s commercial fishing occurs within territorial waters, their lack of local capacity to make and enforce regulations and the expectation by NMFS and the CFMC that the USVI will automatically adopt the regulations recommended by them, means that the commercial fishers and territorial managers have little say in how the resources are managed.

**Did Commercial Fishers Influence the ACL Development Process?**

The dissertation also provided an opportunity to closely follow the development of a regulation through the CFMC process. This is important because it provided a way for me to observe the process as it occurred first-hand, as opposed to merely asking participants about their experiences. Interestingly, commercial fishers and NMFS scientists view the extent to which the fishers influenced the development of the ACLs
quite differently. Not surprisingly, the few fishers that are involved in the management process regularly were not in favor of the ACLs when it was first announced that they were going to be developed. For them, it meant another set of regulations that would be placed on them for which they saw no need. One of their main arguments included in their public and private comments was that NMFS and the CFMC keep making regulation after regulation, without following up to see if any of those regulations are actually making a difference. Specifically regarding the ACLs, the argument was that the territory had just banned the gill and trammel nets, which all parties agreed would greatly reduce the catch of certain reef species. The fishers did not understand why the ACLs had to be put in place when they had not yet seen how the net ban impacted the total catch and the fish populations.

Reflecting the points made earlier in this chapter regarding the fishers’ tendency to disagree with any and all new regulations, the fishers simply wanted the CFMC to listen to them and to not implement ACLs. However, as several CFMC staff, CFMC members, and NMFS administrators and scientists pointed out during interviews, not implementing the ACLs was not an option. The CFMC was mandated to do so by Congress, and so they were obligated to develop them in the US Caribbean region. As the process moved forward and the CFMC and NMFS realized the insufficiencies with the commercial catch data for St. Croix and the need to develop an improved commercial catch reporting system, informal discussions occurred between the fishers and NMFS scientists. Both parties acknowledged the inaccuracies that were likely in the past and current data due to fishers either under-reporting or over-reporting their catch, and through these discussions the fishers began to see the importance of having accurate
catch data, especially when it came to setting ACLs. For example, if fishers under-reported their catch of a species, and the ACLs were to be set based on that data, then the ACL was likely to be set lower than the fishers desired. Fishers voiced their concerns that if they did begin to report their catches accurately, and the data showed that the total catch was increasing, then they would be penalized and the ACL would be dropped even lower the following year. The scientists understood these concerns, and because they believed in the importance of obtaining accurate catch data, they addressed this concern in the ACL amendment. To do so, they added a provision to the proposed management alternatives which requires scientists and managers to consult with fishers when ACLs are exceeded. This allows a determination to be made regarding whether the ACL is exceeded due to an actual increase in catch or if it was due to improved data collection. Including this provision would hopefully encourage more accurate catch reporting, without the inevitable threat of being penalized.

Although the fishers did not feel they had much impact on the ACL development process, primarily because they were not able to completely stop the implementation of the ACLs, many of the NMFS scientists involved believed they had a significant impact on the process. It is important to note, however, that these fishers did not influence the ACL development process through the public participation channels as established by the council system. Their input was not provided formally through a single statement given at a public hearing, nor was it provided to the CFMC through a written statement. Although the fishers’ concerns about the potential to be penalized for providing more accurate catch data was mentioned in a general way in their public comments at scoping meetings, this collaborative problem-solving really occurred through a series of informal,
“behind the scenes” discussions. Through these less formal and more personal conversations with the scientists, they built a rapport with one another, and they were more willing to candidly share their concerns and ask questions about things they did not understand about the others’ perspective.

This experience suggests that the more formal public participation methods provided by the Council system may not be the most effective methods through which to obtain constructive and informative data from the fishers themselves. While these public participation methods may be effective in other US regions, where fishers are well-organized and may even have the money to hire a scientist or lawyer to help them understand the complicated and extensive council amendments and regulations being proposed, the research indicates they do not promote effective participation in St. Croix.

**Chapter Summary**

In this chapter, I compared fishers’ and non-fishers’ responses regarding their knowledge of, participation in, and beliefs about fisheries management in St. Croix. Data suggest that fishers’ and non-fishers’ fisheries management knowledge, as well as their beliefs about management, are influenced by historical and current patterns in inequalities linked to ethnicity, education level, and other demographic variables. These levels of knowledge and perceptions toward fisheries management, then, directly impact the extent to which fishers and non-fishers participate in the federal fisheries management process as well as the manner in which they participate. Additionally, the data suggest that the current structure of the fisheries management system in St. Croix, characterized by the lack of a clear separation between territorial and federal management, creates an environment in which all stakeholders—fishers and non-fishers—feel they do not need to
pay attention to or participate in the federal management process. The low level of participation observed during fieldwork and indicated by the data presented here is also impacted by the complexity of the council process, the formal mechanisms through which stakeholder participation is encouraged, and participants’ perceptions that the CFMC does not take their comments and opinions into consideration when developing regulations and making management decisions. These points provide scholars and managers with important information regarding the complex relationships among historical and current demographic patterns, the role of the state in multi-scale resource management institutions, and patterns of stakeholder participation in common pool resource management processes (Agrawal 2002; Berkes 2009).
CHAPTER 9

RESULTS: FISHERS’ ORGANIZATION AND PARTICIPATION

Chapter Overview

In this chapter, I present data regarding the organization and social relationships among St. Croix’s commercial fishers and examine the relationship between the extent of that organization and fishers’ participation in the management process. In Chapter 8, I compared commercial fishers and non-fishers regarding their knowledge of, participation in, and beliefs about fisheries management in St. Croix. This allowed me to examine what impacts the extent to which these groups participate in the Caribbean Fishery Management Council (CFMC) management process via the formal mechanisms established by the council system for that purpose (attendance of meetings, submission of oral and written statements). The data indicate that fishers’ low level of participation is a result of the complexity of the council process, the formal mechanisms through which stakeholder participation is encouraged, and participants’ perceptions that the CFMC does not take their comments and opinions into consideration when developing regulations and making management decisions.

As described in Chapter 2, much of the commons literature regarding management institutions has focused on identifying conditions related to the success of community-based resource management (CBRM) strategies (Agrawal 2002, 2003; Berkes 2009; McCay 2002). Most of this research focused on case studies in which
successful, robust, local-scale resource management institutions existed. Often, these
communities were relatively isolated, and the management institutions described were
based on socially-induced management strategies that had been in place for many years.
In this chapter, I present semi-structured interview data regarding participants’
perceptions of whether fishers are organized, the reasons why they are not, and how it
would help them if they were better organized. These data are presented and discussed
by topic, and supplemented with data collected through participant observation, informal
interviews, and observation at public meetings, which are indicated in the text. This
allows me to examine the social organization of resource users in a place where complex,
socially-induced commons management strategies that currently dominate the literature
do not exist. I explore what the lack of formal organization means in terms of fishers’
participation in the federal fisheries management process and the extent of their influence
regarding management decisions. Additionally, I utilize ethnographic and archival data
in order to explore how historical patterns of ethnic relations and fishing practices are
related to the social relationships among fishers and the organization of fishers today.

**Background Information Regarding Fishers’ Organizations in St. Croix**

According to interviewees, there have been a few attempts to establish fishing
cooperatives in St. Croix, one of which occurred in the early 2000s. A local commercial
fisher involved with the St. Croix Fisheries Advisory Committee (FAC) and the CFMC
began the cooperative at that time, looked for loan money, as well as began to develop an
export market for fishers’ catch. While several fishers bought into the cooperative,
participants indicated during semi-structured and informal interviews that rumors
circulated regarding the dishonest manner in which the head of the cooperative was using
the money, as well as regarding his involvement in illegal activities. As a result, most fishers pulled out of the cooperative and it collapsed before it ever really got off the ground. The gentleman in charge has since passed away, so he was not available for me to interview. However, several fishers, members of the FAC, and Department of Planning and Natural Resources (DPNR) employees indicated the long-lasting effect this experience has had on many of the island’s fishers who were involved. During a semi-structured interview, one fisher commented:

*That’s the only experience these guys have had with a co-op or organization. All they see is that they were cheated, so now they don’t trust anyone who wants to get something like that going again.*

Despite the high level of mistrust most fishers have for any kind of fishermen’s cooperative or organization, a small number of fishers believe in the need for an organization and began the St. Croix Commercial Fishermen’s Association (SCCFA) in 2005. Although about 50 fishers showed up to the first meeting, and 20 fishers then became paying members, the fishers’ interest faded quickly. The organization’s officers expressed a great deal of frustration due to this lack of interest. When interviewed, one stated:

*I don’t know what else we can do... I feel like we’ve tried everything. Either they just don’t care what happens or they care and they want us to fight for them, but they don’t want to have to pay any money or go to meetings. But it doesn’t work that way. It’s not fair for us to give up our time and not get any support from them.*

Several FAC members and DPNR employees also acknowledged and sympathized with the frustration experienced by those fishers who were involved in the management process due to the apparent lack of appreciation from the island’s other fishers. Ironically, the lack of appreciation the fishers who are not involved have for those who
are ends up frustrating those who are and making them angry. As a result, this creates further division among the fishers and decreases the likelihood of cohesive organization.

**St. Croix Commercial Fishers’ “Organization”**

This section presents participants’ responses from semi-structured interviews regarding whether or not they felt that St. Croix’s commercial fishers were organized, as well as the reasons for their responses. I first present data from their responses to the semi-structured interview questions “Do you think St. Croix’s commercial fishers are well-organized?” and “Why aren’t they well organized?” In order to discuss in detail each of the reasons provided during semi-structured interviews for why they are not well-organized, I use direct quotes from semi-structured interviews as well as data collected through participant observation. I then present data regarding why they are not well organized collected through participant observation and informal interviews that were not provided as reasons by fishers during semi-structured interviews.

**Results: Are St. Croix’s Commercial Fishers “Well-Organized?”**

During semi-structured interviews, commercial fishers were asked whether they thought the island’s fishers were well-organized as a group. I did not specify what I meant by “well-organized,” nor did any participant ask me to explain this point further. For all intents and purposes, participants’ responses to this question indicated they interpreted this term to refer to the existence of one cohesive group of fishers (either informal or formal) that held common beliefs and goals regarding fisheries management. The majority of the fishers interviewed (85.1%) indicated they felt they were not well-organized, while only 14.9 percent indicated they felt they were.
Results: Reasons Why Fishers Are Not Well Organized That Were Found in Both Semi-Structured Interview Data and Participant Observation

Fishers offered several reasons for why they felt they were not organized, and many participants provided more than one reason. Table 17 shows the percentage of fishers who felt each reason contributed to their lack of organization.

Competitiveness

The response provided by the largest percentage (75%) of fishers during semi-structured interviews was that they are not well-organized because commercial fishers in St. Croix are very individualistic and competitive. This point is not surprising, and social science research established decades ago the connection between fishing as an occupation and individualism (Poggie 1980; Pollnac and Ruiz-Stout 1977). In this study, when the fishers interviewed were asked why they fished, many indicated that they liked being their own boss, and did not want to have to answer to anyone else. They said they could make their own schedule and work only when they wanted. As a result of these individualistic feelings, fishers are primarily concerned with their own boat’s catch, sales, and income. Stemming from that independence and self-concern is a sense of competitiveness over who makes the most money. Many responses regarding why fishers were not organized into one cohesive group reflected this focus on income and competitiveness. As one fisher stated:

*We just do our own thing, we have to make as much money as we can.*

When asked why he thought fishers were not organized, another participant responded:

*Selfishness. When it comes down to harvesting and money, it’s every man for himself.*
Table 17. Percent of fishers who believed each reason contributed to their lack of organization. Note: total percent is >100% because some fishers indicated more than one response.

<table>
<thead>
<tr>
<th>Reason</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishers are too competitive/individualistic</td>
<td>75.0</td>
</tr>
<tr>
<td>There are many small groups</td>
<td>15.0</td>
</tr>
<tr>
<td>Fishers don't care</td>
<td>12.5</td>
</tr>
<tr>
<td>We have never needed to be organized</td>
<td>12.0</td>
</tr>
<tr>
<td>Fishers don't understand the need to be organized</td>
<td>10.0</td>
</tr>
<tr>
<td>Different ethnicities among fishers</td>
<td>5.0</td>
</tr>
<tr>
<td>Different gears used among fishers</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Participant observation conducted at the “fish market” also revealed this competitiveness among fishers.\textsuperscript{42} Although some fishers feel that there is an informal agreement regarding how much to charge per pound for reef fish such as parrotfish, pelagics such as dolphin, conch, or lobster, participant observation indicated that other fishers blatantly ignore this and charge less for their fish. While many fishers have loyal customers who choose to only buy from them, there are still many island residents who visit the Saturday morning market at La Reine in search of the lowest price for the kind of fish they are after. If there is one fisher there who is selling his fish for less, then he is viewed as hurting the market for the rest of the fishers and stealing customers. Informal interviews indicate that this behavior often proceeds without confrontation, due to a concern for personal safety or future retaliation.

\textsuperscript{42} In this case, I am referring to the wooden stands a few fishers have built near the government-established fish market at La Reine that was shut down in 2007. This is described in more detail later in the chapter.
On another occasion, I was interviewing a long-time pelagic line fisher at the Saturday La Reine market. When I asked him if he thought the commercial fishers were organized as a group, he said no, and pointed across the parking lot:

Look… [unnamed fisher] is selling in two different places. He’s got his stand over there, and he’s also selling out of this truck here. That’s not fair. If we were together as a group, that wouldn’t happen. But he don’t care about no one else.

Similar cases were pointed out by other participants, describing the self-centered perspective of most fishers. Moreover, the reaction of many fishers to others’ competitive and self-centered behavior was to simply become that way themselves. As one fisher stated:

I’d like to see us get more organized, but it’ll never happen. So many don’t care. So, why should I? I’ll just do my own thing too.

Similar sentiments were echoed by other fishers interviewed, indicating that the competitiveness and self-centeredness of some ultimately affect other fishers’ willingness to work toward becoming a more cohesive group.

Many Small Groups

Although mentioned by fewer participants during semi-structured interviews, the second-most common response (15%, see Table 17) by fishers when asked why they were not well-organized as a group is that there are many little groups within the fishery. One fisher explained:

There’s all these little groups. You just stick to your group and compete with others.

When probed further regarding the composition of the small groups, most fishers indicated they did not know why certain fishers grouped together. I then often asked specifically if they thought it had to do with differences in ethnicity or in the fishing gears
used, and fishers overwhelmingly responded that they did not think that was the case, utilizing phrases such as “we’re all fishermen.”

Participant observation and informal conversations with fishers indicated that these small groups were often linked to family relationships and other forms of social organization such as church communities. An important aspect of this is that in St. Croix, as in many other Caribbean island societies, the term “family” does not just refer to one’s immediate family, nor even one’s extended family through blood relationships (Stoffle, et al. 2009). Instead, it is a more communal term, often including those you live close to, people you have known for an extended period of time, and those you interact with socially, such as through religious activities. While these groups sometimes correspond with ethnic groups, they do not always. Nor do members of these groups necessarily fish using the same gear or target the same species. This is noteworthy because fishers often organize around common fishing practices, such as use of the same gear and/or targeting the same species (Basurto and Ostrom 2009; Nielsen and Vedsmand 1997).

I observed on several occasions that these small groups provided support for fishers who encountered financial difficulty or mechanical problems. For example, when I stopped by a fisher’s house to say hello, I would often find several other fishers there helping him work on his boat’s engines or repairing other aspects of his boat or gear. In addition, there were instances when fishers would either sell an unused boat to another fisher who did not have enough money to repair his own boat for a very low price or in some cases, even give it to him for free. These behaviors certainly indicate a sense of support and reciprocity within these small groups, and suggest some form of organization
among fishers, but do not seem to carry over to the larger community of commercial fishers.

**Ethnicity**

Although only two fishers (5%) suggested that ethnicity played a role in their lack of organization during semi-structured interviews, several non-fishers suggested that it did matter. One FAC member stated:

*There’s different cultures. Hispanic versus Eastern Caribbean versus local. There’s different leaders of each cultural group.*

Another non-fisher (ex-DPNR employee) described the cultural differences among fishers in St. Croix by comparing them to those in St. Thomas:

*They’re not as organized as over in St. Thomas. But they’re all French over there. I mean, you look at the list of fishermen and there’s like four last names. That’s it! And they’ve been there forever.*

In this case, the individual was referring to the fact that the majority of the fishers in St. Thomas are “Frenchies”—French descendants of those who migrated from the French colony of St. Barts in the 1800s. Although during the early part of their settlement in St. Thomas there was a fair amount of separation between the two French settlements on the island (one on the north side and one on the south side) (Stoffle, et al. 2011), today their French heritage is one of several unifying factors. In contrast, the situation is very different in St. Croix, in that there is more heterogeneity in terms of ethnicity among fishers, and many of the fishers either migrated to St. Croix themselves or are part of the first generation of their families to be born in St. Croix. A non-fisher participant who has played many different roles in fisheries management in the USVI (as a DPNR employee, FAC member, CFMC advisory panel member) described what these different historical migration patterns mean for the organization of the fishers today:
So that long-term French background in St. Thomas carries over today to the fishing community. They have cultural fishing community events, like the Bastille Day tournament, which brings them all together. It’s different here. Many of these guys still have strong ties to the islands where they were born, like Vieques.

While this in no way intends to imply that the fishers in St. Thomas are a homogeneous, well-organized group without inter-group conflict, it does lend itself well to comparison with St. Croix, where many fishers retain their identities relative to their native islands. For example, semi-structured and informal interviews indicate that many commercial fishers still have close family members living on these other islands, and often return to those islands for extended periods of time. Additionally, it is not uncommon for fishers to return to their native islands to live when they have retired from fishing.

It is interesting, however, that although several DPNR employees and other non-fishers felt ethnicity impacted the fishers’ organization, most of the fishers interviewed did not. Ethnographic data suggest this is tied to the complex patterns and meanings of ethnicity present in the island’s society. As described in Chapter 4, despite the ethnic heterogeneity of the commercial fishers in St. Croix, the divisions do not seem to be so strong that they are able to break the ties that bind them due to the shared experiences of colonialism. These shared experiences continue to place them in opposition to the white Continentals who hold the majority of the fisheries scientist and management positions at both the territorial and federal levels. As a result, the fishers may not perceive the ethnic differences among them to be as great as those between the fishers as a group and the fisheries scientists and managers. Further research is needed to explore this finding in greater detail.
“Most Fishers Don’t Care”

Fishers also responded during semi-structured interviews (12.5%, see Table 17) that they thought they were not well-organized as a group because “most guys don’t care.” Some fishers linked the lack of concern they felt other fishers exhibited to the self-centeredness to which I referred earlier:

*The regs only affect certain people. [Most guys think] “If it doesn’t affect me, then I don’t care.”*

This comment about regulations only affecting certain fishers is important, because it is related to the multi-gear nature of the fishery. If a regulation is passed restricting the use of a certain type of gear, because fishers usually use several different kinds of gears and to varying degrees, that regulation often only has the potential to impact a fraction of the total fisher population. For that reason, there is rarely a regulation or management action that affects all fishers, which would likely serve as a reason to unify them in response.

*Fishers Did Not Need to be Organized in the Past*

A small percentage (12%) of the fishers who were interviewed suggested that the commercial fishers in St. Croix are not well-organized today because they have never needed to be. One fisher who has been fishing commercially in St. Croix for over 35 years stated:

*We never have been... really never needed to be. Everyone’s just done their own thing.*

Another long-time fisher described his understanding of the relationship between the lack of regulations in the past and the current level of organization:

*There weren’t any rules before so we didn’t need to, but now we need to be [organized].*
These comments provide a historical perspective on commercial fishers’ organization in St. Croix, and offer another reason for why many fishers have not wanted to, or felt a need to, be organized. Archival and ethnographic research suggest that without strict regulations and enforcement in the past, fishers were able to work independently and did not have a need to be organized in opposition to managers. In Chapter 6, I also discussed historical characteristics of the islands’ fishers and fisheries, and although earlier reports sometimes discussed the organization of the fishers in terms of the fish market, there was never any mention of fishers’ organizations or cooperatives. Swingle (1970) discussed the absence of any such cooperative, discussing that the establishment of such an organization could assist in the development of the island’s fisheries. However, as described at the beginning of the chapter, there has never been a successful cooperative in existence in St. Croix.

**Results: Reasons Why Fishers Are Not Well Organized That Were Found Only Through Participant Observation and Informal Interviews**

*Lack of Enforcement*

Although not offered by participants as a reason for the fishers’ lack of organization, other ethnographic data suggest that the figurative “elephant in the room” is that without effective and consistent enforcement of regulations, there is little need for fishers to be organized. Many fishers who were interviewed indicated they felt one of the main benefits to being better-organized is that they would have a stronger, more unified voice when dealing with managers and the increase of regulations. This point is addressed in detail later in the chapter, but what is important to note here is that they recognize the power that is tied to having a unified voice against a common cause.
Participant observation throughout my fieldwork indicated that while almost all fishers—those highly involved in management as well as those not involved at all—get very concerned and upset at the idea of the implementation of new regulations, the reality is that most regulations have little impact on fishers due to the lack of enforcement. Because the regulations are not enforced and therefore have little impact on the fishers, they do not feel the need to be organized as one cohesive group and to become involved in the management processes. This relates to the commons literature because it is generally agreed that an important facet of successful commons management regimes is a set of locally-devised management rules that are easily enforced through graduated sanctions (Agrawal 2002; Ostrom 1990). Ethnographic research suggests this is not the case in St. Croix.

Lack of Fishing “Places”

Participant observation also indicates that there are other characteristics of St. Croix’s fisheries which may contribute to the lack of a cohesive and organized group of commercial fishers. For example, as discussed in Chapter 7, the majority of the commercial fishers keep their boats at home and use a trailer to transport their boats to the dock or landing site they decide to use on any given day. While this mobility may be beneficial in that it allows them to alternate launching locations based on each fishing day’s weather conditions or other factors, it also means that fishers may not see and interact with the same fishers (aside from their crew) every time they fish. While I observed a variety of different kinds of interactions between fishers and crews at landing sites—ranging from friendly conversations, to sarcastic “play fighting,” to cases in which fishers ignored one another—these interactions varied on a day-to-day basis and fishers
never knew who they would see on any given day. These inconsistencies are important
in that self-organization of resource users is seen to be linked to the level of trust and
reciprocity of the group, which may increase with repeated and consistent interactions
that foster a sense of community and commonality (Ostrom 2002). Basurto and Ostrom
(2009) describe how a fishing cooperative in Mexico achieves a high level of trust and
reciprocity because it is based on long-term family relationships. To date, this transfer of
trusting family relationships to the establishment of a fishing cooperative has not
occurred in St. Croix.

Linked to this point regarding variation in the use of landing sites is the lack of a
central fish market. Such a market would provide another location where fishers could
interact on a regular basis, regardless of what species they target and what gear they use.
As described in Chapter 6, fish markets have long held an important role in Crucian
society as both places where residents (usually women) bought fresh fish to feed their
families, as well as a place for sociocultural sharing and exchange. Although prior
reports (such as Fiedler and Jarvis 1932) described the fish markets on the islands and the
market women who sold the fish, the markets are markedly absent from Swingle et al.’s
(1970) report on USVI fisheries (described in detail in Chapter 6). It is unclear whether
these markets were absent during their survey, or if the authors were only focused on
reporting on the presence of a more formal fishermen’s cooperative. Therefore, it is
unclear when the marketplaces in Christiansted and Frederiksted ceased being the central
places for the selling of fish. Valdes-Pizzini, et al. (2010) and Stoffle et al. (2009)
suggest that the gentrification that has occurred around Christiansted and the
displacement of fishers from coastal locations due to increased tourism and development
since the 1970s has altered traditional fish-marketing patterns. In the absence of active
fish markets, fishers in the past would sell their fish on the roadside or make deliveries.
In 2002, the government built the La Reine Fish Market, in hopes of establishing a
central location where fishers could bring their catch and where residents throughout the
island could come to purchase fish. However, due to unsanitary conditions, the market
was shut down in 2007.

Fishers had mixed feelings toward the government-built market, and toward fish
markets in general. Many fishers do not want to sell their fish around other fishers,
because they do not want the competition. Often, they have their own regular customers
who come to their individual places of sale, and they are afraid that if they sell in a
location such as a market, their sales will decrease. Others saw the benefit of having a
central market, but were frustrated that the government failed to consult with the fishers
about how it should be designed (which they believe led to the sanitation problems and
the market’s closure) and what would make them want to sell their fish there before it
was built. Those fishers who understand the need of a central market explained that other
fishers do not see the benefits:

They just don’t get it. If we set up a market where we could sell our fish,
we could work together to set a fair price. Ideally, we could set up a
cooperative of sorts where we could automatically sell our catch every
day and not have to sit around the market selling after being out fishing
for eight hours. If everyone gets to sell their fish for the same price, then
that reduces a lot of the competition.

Ethnographic data suggest, however, that most fishers do not view it this way and would
rather market their fish on their own.

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Although the La Reine Fish Market building has been shut down since 2007, some fishers have constructed their own wooden, make-shift stalls in the market’s parking lot where they sell their fish (Figure 18)\textsuperscript{43}. However, this is only a small number of fishers, and most still sell their fish at various roadside locations around the island or make deliveries to restaurants, hotels, and private individuals. It is likely that these marketing patterns contribute to the lack of a single cohesive fishers’ organization and competitive marketing among fishers.

\textsuperscript{43} As described earlier, this make-shift market located in the parking lot of the shut-down government-established La Reine fish market is where I conducted much of my ethnographic research.
Organization of the Fishers and Participation

Results from Semi-Structured Interviews

Despite the fact that the majority (85.1%) of the fishers who were interviewed indicated they did not think the commercial fishers were well organized, 73.5 percent stated they believed it would help them if they were. When asked how it would help them, 55.5 percent stated that being better organized would give the fishers a unified, stronger voice that would give them more power at management meetings. As one fisher indicated:

*The feds and DPNR think they can walk all over one guy, but if we were one group, they might leave us alone. It would give us more power.*

Another stated:

*We’d have a stronger voice, get more attention from the feds. Guys picked could stand for we and represent we when it comes to rules and regulations.*

As indicated by these statements, many fishers recognize the potential power that goes along with a united front backed up by many individuals.

Results from Participant Observation

Despite this understanding, participant observation indicates that most fishers continue to show their lack of concern and interest in fisheries management issues by failing to show up to meetings, remaining uninterested in management issues, and exhibiting a general sense of indifference. As a result, only a few fishers are consistently active in management activities.

Discussion

Returning to my research question regarding how the organization of the fishers (or lack thereof) affects whether and how they participate in the federal fisheries
management process, the ethnographic data suggest the answer is not straight-forward. Although most of the interview participants (fishers and non-fishers) indicated they believed greater organization would help fishers by giving them a stronger voice in the management process, it is not clear that it would make much difference.

Commons scholars have suggested that “improving the quality of participation by fishing groups in the management process is… essential for achieving more sustainable, equitable and efficient outcomes” (Kitts, et al. 2007:193). Further, there are examples from the US in which fishers’ organizations have played key roles in the establishment of collaborative management and co-management structures within the context of the regional fishery management councils. Pinto da Silva and Kitts (2006) describe eight different fishers’ groups in the Northeast region that were identified to be at some advanced stage of developing co-management proposals with either the New England Fishery Management Council or the Mid-Atlantic Fishery Management Council. Similarly, Hall-Arber (2005) describes a case from the New England Fishery Management Council in which fishing organizations played key roles in the establishment of a fishery management plan amendment with elements of adaptive co-management. In these cases, however, the authors stress other factors (not just the presence of fishers’ organizations) that may be critical to the establishment of these management relationships and outcomes, including the existence of a clearly-stated policy that encourages collaborative relationships (Pinto da Silva and Kitts 2006), the presence of a key leader within the fishing community whom others trust and with the ability to mobilize social networks (Hall-Arber 2005), and the existence of a perceived “crisis situation” (such as a proposed regulatory change that was likely to impact the
majority of fishers involved) to which the groups were responding. As described in detail in Chapter 8, data collected during this study suggest that in St. Croix, there are many other factors that influence fishers’ participation in the process—such as historical patterns of inequality due to ethnicity and other demographic variables, the lack of cooperation between territorial and federal managers, and the lack of effective enforcement of fisheries regulations—that are likely to remain even if fishers were more cohesively organized.

Additionally, as described in Chapter 8, data from semi-structured interviews and participant observation indicate that the few fishers who do participate in the management process via the formal mechanisms offered by the CFMC are not perceived by that body to be providing constructive, helpful comments that the CFMC can use to develop management measures. It is unclear whether this would change if the fishers were well-organized. Moreover, CFMC members, staff, and those who are on the CFMC Advisory Panels perceive that they take all fishers’ comments into consideration when developing regulations and making management decisions; however, the fishers do not. While the ethnographic data collected in this study do not allow for a discussion of the extent to which comments are in fact taken into consideration, the difference in opinions between these two groups suggests that a lack of transparency exists such that fishers cannot clearly see how the CFMC uses their input to make management decisions. Either way, there is little evidence to suggest that more cohesive organization of the fishers would alter these divergent perceptions.
Chapter Summary

In this chapter, I examined participants’ perceptions regarding the lack of organization of St. Croix’s commercial fishers. Ethnographic data suggest that there are a variety of factors that contribute to this lack of organization, including: high levels of individualism and competitiveness; small factions within the larger fishing group based on church affiliation or other forms of social organization; ethnic and fishing method heterogeneity; a lack of historical fishing regulations; a lack of communal fishing community places, such as a fish market or dock; negative past experiences with fishers’ organizations; and a lack of enforcement. Despite the lack of organization, almost all fishers and non-fishers interviewed indicated they believed greater organization would be beneficial to the fishers (and fisheries management in St. Croix in general) because it would provide them with a stronger voice in the federal fisheries management process. However, it is not clear from this study whether the increased organization of the fishers or the establishment of a cohesive fishers’ organization would increase fishers’ influence in the federal fisheries management process when other underlying issues, such as the lack of effective enforcement and the lack of cooperation between the territorial and federal management bodies, continue to plague the process.

The data presented here provide important insights into what factors influence resource users’ ability and desire to organize into a formal, cohesive group when operating in a complex, multi-scale management atmosphere. Although the impact of heterogeneity among resource users in their ability to self-organize and develop long-term sustainable management institutions is debated among commons scholars (Basurto and Ostrom 2009; Ostrom 2002), this study suggests that historical patterns of
demographic differences, social inequalities, and diversity in fishing practices can have a lasting impact on the extent to which resource users are willing and able to organize. Further, the data presented here suggest that although a great deal of the anthropology literature regarding common pool resources has emphasized the ability of resource users to organize themselves and develop sustainable management institutions in the absence of state regulations and formal property rights (Agrawal 2003; McCay and Acheson 1987), that is not always the case. Moreover, as communities throughout the world are becoming increasingly inter-connected due to the globalization of markets and economies, understanding the relationships between common pool resource users’ social organization and multi-scale management institutions is becoming absolutely critical (Berkes 2009).
CHAPTER 10

CONCLUSIONS AND POLICY RECOMMENDATIONS

Chapter Overview

Building upon anthropological critiques of common pool resource theory and fisheries management institutions, in this dissertation I examined the mismatch that exists between St. Croix’s small-scale, multi-gear, multi-species fishery and the federal fisheries management system in which it is embedded. Utilizing political ecology’s multi-scale approach allowed me to describe the complex relationship between territorial and federal fisheries management and how the island’s commercial fishers and other stakeholders experience and perceive management processes. Furthermore, by using ethnographic methods and theoretical insights from political ecology to examine the historical, social, and political factors that impact how fisheries resources are managed in St. Croix, this research thoroughly considers the relationships between local conditions and the socio-political management contexts in which they are embedded.

In this chapter, I summarize the main findings of the dissertation, relating them specifically to each of my research questions. I also discuss the study’s main contributions to the fields of anthropology and applied anthropology. Additionally, I present relevant policy recommendations based on my research as well as directions for future research.
Revisiting the Research Questions

Research Question 1

My first research question, “What is the social, economic, and historical role of fishing in St. Croix?”, was geared toward developing an understanding of the history of fishing behavior in St. Croix as well as the importance of fishing to the island’s residents throughout time as a source of food, income, and socio-cultural identities. As expected, research indicated that fishing has played an important role for centuries. Although fishing was an important practice for gathering food for the Arawaks and other prehistoric groups, it took on an even more important role during colonial times. As described in Chapter 6, being a “fishing slave” on a plantation allowed for greater freedom than field workers, and for other slaves, it provided an opportunity for them to supply the Sunday market with goods they could sell in order to save money toward purchasing their freedom. Moreover, once individuals were free or after Emancipation, being a fisher allowed them to enter society as producers of a commodity, as opposed to being commodities themselves. Surely this assisted them in establishing their new lives and independence as freed slaves.

I carried out a thorough analysis of the island’s commercial fishery throughout history, using archival data, data collected through historical surveys and censuses, and first-hand accounts. This analysis indicates that many characteristics of the fishery and fishers have remained the same for the past 100 years. The fishery continues to be a small-scale, multi-species, multi-method fishery, with little (if any) fish exported. Almost all fishers continue to be non-white, with many of them utilizing fishing as one of several methods for obtaining income (occupational multiplicity). Despite the
recommendations from researchers throughout the mid-1900s that the island’s fishery should be expanded and moved toward the large-scale, industrialized fishing model that was common in the United States (US) mainland, the fishery remained small and fishing still occurs primarily from small boats with traditional methods such as fish pots and spearfishing.

Archival research and participant observation also stressed the importance of the fish market in Crucian society, both in the past as well as today. Despite the economic development and migration of various ethnic groups that has occurred since the 1960s as a result of the establishment of the tourism and manufacturing industries on the island, residents continue to utilize the fish market (especially on Saturdays) as a place to buy their fish as well as to socialize with family, friends, and other residents. This is a practice that began centuries ago, and continues today, despite the lack of a government-established central fish market.

Research Question 2

My second research question was: “What is the current structure of marine fisheries management in St. Croix?” The point of this question was to not only describe how fisheries management occurs at both the territorial and federal levels, but to also document the differences between how management is supposed to occur (according to laws and mandates) and how it actually occurs in local practice.

Archival research, semi-structured and informal interviews, participant observation, and observation at regulatory meetings indicates that there are several barriers which prevent fisheries management at both levels from occurring as they are legislated. The lack of funding and resources available to the territorial management
bodies (Department of Planning and Natural Resources, DPNR; Division of Fish and Wildlife, DFW; Division of Environmental Enforcement, DEE) prevents these bodies from carrying out many of their prescribed duties—duties which are critical to effective fisheries management, including fisheries data collection and the consistent enforcement of regulations. Additionally, territorial politics related to government elections and the governors’ emphasis on economic development plays a large role in determining which individuals hold important upper-level positions within the agencies. As a result, there is inconsistent support available to DPNR employees and inconsistent implementation of fisheries regulations as recommended by the St. Croix Fisheries Advisory Committee (FAC).

Federal fisheries management in St. Croix also occurs quite differently in reality compared to how it is legislated. A major barrier to this is the lack of control the Caribbean Fishery Management Council (CFMC) has over management outcomes in St. Croix, due to the fact that scientists believe most commercial fishing occurs in territorial waters. Therefore, the success of any regulatory actions taken by the CFMC for federal waters is dependent on the territory adopting compatible regulations in territorial waters. Additionally, the lack of data for the St. Croix fishery (and the US Caribbean in general) makes it very difficult for the CFMC to make sound management decisions. This is especially the case regarding the recent mandate to implement annual catch limits (ACLs) for all council-managed species. This example suggests the mismatch that exists between the US federal fisheries management system—geared primarily to the management of large-scale, industrialized fisheries—and the small-scale, multi-method, multi-species
nature of the St. Croix fishery. As a result, the CFMC is forced to implement
management measures that may not be the most appropriate for St. Croix’s fishery.

Research Question 3

My third research question was: “How are fisheries management decisions made
at different scales, and do commercial fishers participate in this process? Why or why
not? To what extent do fishers and other stakeholders perceive their participation to
influence management decisions?” In order to answer this question, I drew from data
collected through semi-structured and informal interviews, participant observation, and
observation at meetings. In order to conduct a thorough examination of this question, I
used a multi-scale approach, as suggested by political ecology (Paulson, et al. 2005).
Using such an approach allowed me to answer the call from McCay (2002), Berkes
(2009), and others for a more historically-grounded approach to the examination or
resource management institutions that consider the social construction of environments
and resource management issues, and the multi-level political relationships that
characterize resource management systems.

Fishers’ and others’ participation was examined according to the “formal” modes
of participation identified by the council system—through meeting attendance, speaking
at meetings, and sending in written comments regarding proposed management actions.
The results indicate that the mode of participation most utilized by fishers and non-fishers
is meeting attendance. Few fishers and non-fishers spoke at meetings or sent in written
comments to the CFMC. While there were a small number of fishers who consistently
participated in the management process, those that did speak did not provide the CFMC
with constructive comments that allowed the council to properly integrate participants’
opinions into management decisions. Although still a very small number (less than 10%) of non-fishers indicated they had sent in written comments, this number was greater than that for the fishers. Fishers indicated they felt those who utilized this route (primarily representatives from environmental non-government organizations) were being “sneaky,” and that they had more influence over management decisions this way. Also, semi-structured interview data suggested that while most fishers perceived that they had very little influence over management decisions, CFMC members disagreed, indicating they felt that they always took fishers’ and other stakeholders’ opinions into consideration. As described in Chapter 8, these points have important implications regarding the participatory nature of the federal fishery management council process. Although the process is described and promoted by the National Marine Fisheries Service (NMFS) and council staff as a “shining example of true, participatory democracy” (NMFS and Councils 2003:23), fishers in St. Croix do not experience it as such. Often, the complexity of the topics discussed contributes to the discomfort of the fishers to engage in “on the record” conversations about those topics. Additionally, those who do provide comments do not feel they are taken into consideration. The result is a system in which both fishers and non-fishers perceive they have no influence.

Research Question 4

My fourth research question was: “How do social relationships and the organization of the fishers affect the extent to which they participate in the management process and influence management decisions?” The purpose of this question was to examine the level of cohesion and organization among St. Croix’s commercial fishers,
and to uncover the historical, social, and political factors that influence the extent of organization.

Ethnographic research indicated that the commercial fishers in St. Croix are not organized into one formal, cohesive group. Previous negative experiences with attempts at organizing cooperatives on the island have left fishers skeptical of the utility of fishers’ organizations, and current efforts to develop an active organization have been largely unsuccessful. The large majority of fishers who were interviewed indicated that fishers’ competitiveness and individuality prevented them from being an organized group.

Although many non-fishers believed the ethnic heterogeneity of the fishers contributed to the lack of organization, the fishers who were interviewed did not believe this to be the case. The data suggest that for the fishers, the more salient ethnic differences are those between the fishers as a group and the white, Continental, “outsiders” who hold most of the fisheries scientist and manager positions. Despite—or perhaps due to—this shared colonial history of the non-white fishers, because fisheries regulations that are in place have relatively little impact on them (due primarily to a lack of enforcement), they have little impetus or desire to organize into a formal group.

Participant observation and informal conversations with fishers indicated, however, that there is some level of organization among the fishers. There were several small groups of fishers present, often linked to family relationships and other forms of social organization such as church communities. While these groups sometimes corresponded with ethnic groups, they did not always. Nor do members of these groups necessarily fish using the same gear or target the same species. This is noteworthy because fishers often organize around common fishing practices, such as use of the same
gear and/or targeting the same species (Basurto and Ostrom 2009; Nielsen and Vedsmand 1997). Future research examining the make-up of these groups, the history of their foundation, and the intricacies of the social relationships among the members could provide scientists and managers with important information regarding the support and reciprocity within these small groups, and could suggest why this form of organization exists among fishers, but does not seem to carry over to the larger community of commercial fishers.

**Research Question 5**

My final research question was: “How does the structure of the federal fisheries management system affect the extent to which the fishers and other stakeholders are able to influence management decisions?” The purpose of this question was to examine the extent to which fishers and other stakeholders used the formal participation modes available to them in order to influence management decisions. By doing so, I was able to identify what factors impact whether and how they participate. In Chapter 8, I compared fishers’ and non-fishers’ responses regarding their knowledge of, participation in, and beliefs about fisheries management in St. Croix. Data suggest that fishers’ and non-fishers’ fisheries management knowledge, as well as their beliefs about management, are influenced by historical and current patterns in inequalities linked to ethnicity, education level, and other demographic variables. These levels of knowledge and perceptions toward fisheries management, then, directly impact the extent to which fishers and non-fishers participate in the federal fisheries management process as well as the manner in which they participate. Additionally, the findings suggest that the current structure of the fisheries management system in St. Croix, characterized by the lack of a clear separation
between territorial and federal management, creates an environment in which all stakeholders—fishers and non-fishers—feel they do not need to pay attention to or participate in the federal management process. The low level of participation observed during fieldwork and indicated by the data is also linked to the complexity of the council process, the formal mechanisms through which stakeholder participation is encouraged, and participants’ perceptions that the CFMC does not take their comments and opinions into consideration when developing regulations and making management decisions.

**Contributions to Anthropology**

This study contributes to the anthropological literature by addressing two main gaps in anthropological critiques of commons management strategies. First, it uses a multi-scale approach to describe how fisheries management occurs in a place where complex, socially-induced commons management strategies do not exist. To date, most anthropological studies in this field (such as Acheson 1988) have described the informal or formal management systems that resource users have developed to successfully manage common pool resources. Many of these studies focused on providing examples that debunked Hardin’s (1968) “Tragedy of the Commons” theory, proving that such a result is not inevitable in all situations and locales. With this study I answered the call from scholars such as Berkes (2009), who suggested that it is time to move beyond case studies of “traditional” commons management in order to more fully understand the complexities of common pool resource management in light of contemporary challenges related to multiple scales of governance and the globalization of markets and economies. Using a case study in a locale with no formal commons management regime, I am able to examine the complex relationships among historical and current demographic patterns,
the role of the state in multi-scale resource management institutions, and patterns of stakeholder participation in common pool resource management processes.

Another key contribution of the study to the anthropological literature is a response to the recent call for an in-depth, ethnographic approach to the study of common pool resource management (Agrawal 2002; Berkes 2009; McCay 2002). These scholars suggest that the “traditional” approach to commons research of identifying the conditions or “design principles” that contribute to the successful management of common pool resources are no longer sufficient. In this study, I addressed these critiques by using an approach grounded in in-depth ethnography that considers the larger context in which management systems are embedded. Drawing on political ecology, I examined the historical and political factors that impact the structure of the management system at multiple levels, as well as the relationships among resource users, other stakeholders, and their environment over time. For example, this allowed me to show how relationship patterns among ethnic groups as a result of colonialism continue to impact the extent to which and manner in which commercial fishers participate in management processes, as well as how stakeholder groups interact with one another.

Contributions to Applied Anthropology

The main contributions of this study to applied anthropology are related to the practice of resource management. This study highlights the mismatch between the centralized management approach of the US federal fisheries management system and the small-scale nature of St. Croix’s fishery. In this example, this mismatch has major implications for the success and effectiveness of fisheries management in St. Croix because the CFMC is mandated by Congress to develop and implement management
strategies (e.g., annual catch limits) that are inappropriate for St. Croix’s fishery and the data availability. Resource managers should view this as evidence against a one-size-fits-all approach to the management of fisheries—and natural resources in general—that exemplify variation in characteristics such as the demographics of resource users, methods used to capture resources, and the species being targeted.

Additionally, the results from this study can assist scientists, managers, and policy-makers within NMFS in the appropriate interpretation of federal fisheries management legislation, such as the Magnuson-Stevens Act (MSA). More specifically, it can help develop a better understanding for the meaning of concepts and phrases critical to federal management, such as “fishing community,” and “high dependence” on fisheries (Clay and Olson 2007; Colburn, et al. 2006). Further, through the presentation of the results of this study at conferences and symposia, these findings can be shared with managers of fisheries and other resources from other locations who also work in complex, multi-level management environments, or in locations with long-lasting impacts from colonialism or other historical events.

**Recommendations for Policy and Future Research**

Based on the results from this dissertation research I can make several recommendations for policy and management as well as for future research directions. One important, though likely unrealistic, recommendation is for St. Croix to be granted greater autonomy regarding the management of its fishery resources. As the data presented here suggest, there is a mismatch that exists between St. Croix’s small-scale fishery and the US federal fishery management system that controls the island’s fishery resources in the Exclusive Economic Zone. Because many aspects of the federal system
and process are based on the characteristics and needs of large-scale, industrialized fisheries, many aspects—such as the formality of stakeholder participation modes and the management mechanisms Congress mandates the regional councils to use—are not well-suited to or appropriate for the small-scale fishery of St. Croix. If St. Croix was granted autonomy over the management of its fishery, then the likelihood could be increased that more appropriate regulatory mechanisms could be put in place.

Critical to the success of St. Croix managing its own fishery resources would be an increase in the capacity of local scientists and managers to perform their duties. As described in Chapter 5, DPNR currently lacks the funding and resources needed to carry out management as it is now legislated. Without additional funding that can be devoted to the necessary scientific, enforcement, and policy activities, they will not be able to take on the increased management responsibility and effectively manage their resources.

<table>
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<th>Policy Recommendations</th>
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<td>• Give St. Croix greater autonomy to manage its own fishery.</td>
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<td>• Encourage St. Croix’s fishers to establish an active commercial fishers’ organization.</td>
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<td>• Establish comprehensive and easily-enforced recreational fishing regulations.</td>
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<td>• Train enforcement officers.</td>
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<td>• Redirect funding toward enforcement.</td>
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I describe this recommendation as idealistic because it is very unlikely that Congress would grant St. Croix the autonomy to control its fishery. The regional fishery management council system has been in place since the MSA was passed in 1976, and such a major change to the law would require a great deal of upper-level legislative support. Additionally, doing so would represent a major shift in US fisheries policy from a centralized system to a more decentralized system that allows for more local-level and adaptive management strategies. There is currently little indication that such a shift would even be considered by US legislators. In light of the unlikelihood for this kind of major change in policy approaches to fisheries management, it is important for scientists and managers to continue research efforts that focus on how cooperative and collaborative management opportunities can be established within the US federal fisheries management framework as dictated by the Magunson-Stevens Fisheries Conservation and Management Act (MSA).

Another important policy and research focus identified by this study is the need to encourage the organization of St. Croix’s commercial fishers into a more formal, cohesive group. The data presented here as well as case studies from other regions (primarily the Northeast region of the US) (Hall-Arber 2005; Pinto da Silva and Kitts 2006) suggest that a more cohesive, active fishers’ organization could assist St. Croix’s commercial fishers in participating in the CFMC process more effectively and, therefore, could allow them to have more influence over management decisions. Additionally, if key leaders were identified within the organization who could devote greater time and energy to working with NMFS and CFMC scientists and staff to not only understand the Congressional mandates to which they are subjected but to also help integrate fishers’
recommendations and opinions into proposed management actions, the transparency of the process could be increased and fishers could feel more positively about how their opinions were being considered by managers. Moreover, this can lead to perceptions of increased legitimacy of the management process as well as the regulations, which can further increase the likelihood of participation and compliance.

A great challenge associated with this policy recommendation is how to encourage fishers to organize and participate in management processes. An associated question is regarding whose job it is to encourage greater organization, or even if it is morally acceptable for managers or scientists to “encourage” or “help” Crucian fishers to become better organized. These are important applied anthropology questions, and ones that are not unique to the case study described here. If we move beyond the question of ethical acceptability, however, there are many possibilities that can be explored toward the effort of encouraging organization. It may be possible to use organizational models from small-scale fisheries from other locations throughout the world to help educate and train fishers and managers in St. Croix about the benefits of such organization. Further research towards this end should focus on identifying other locations with fishery and management institution characteristics that are similar to those in St. Croix. Additionally, further research that focuses on developing a more comprehensive understanding of the factors on which the small-groups exhibited by Crucian fishers are organized could help identify and build upon effective local organizational strategies.

A final set of policy recommendations and further research directions that I will describe are perhaps more implementable in the short-term. From a more practical standpoint, this study identified a few discrete steps that could be taken that may lead to
more effective fisheries management in St. Croix. For example, steps could be taken which would assist territorial enforcement officers in regulatory enforcement, such as the establishment of a set of comprehensive and easily-enforced recreational fishing regulations. As described by an enforcement officer in Chapter 5, this could allow for easier discrimination between commercial and recreational fishers, which, therefore, could reduce illegal fishing behavior.

Another practical step that could be taken is to refocus federal funding that is currently being used for the development of new federal fisheries management regulations in St. Croix and instead put it toward increased and better enforcement of territorial and federal regulations that are in place now. Training the Division of Environmental Enforcement officers to fully understand the regulations is critical to this, so that they understand the impetus behind the laws, and that in many cases commercial fishers support the regulations. Although maintaining high levels of enforcement is generally quite costly and not practical in the long-run, a temporary redirection of funding and increase in enforcement presence could reap short-term benefits. For example, increased enforcement could send the message to fishers that regulations will be consistently enforced, and that illegal fishing activities will have negative consequences for them. This may be a key factor that will trigger fishers to develop an active fishers’ organization that may be able to more effectively participate in the federal fisheries management process.

**Dissemination of Study Results**

The results of this study will be shared in several ways. First, the complete dissertation will be made available through the University of South Florida library
system, as well as through the Proquest database, which is accessible to the public through most universities and colleges. Additionally, the full dissertation will also be provided to any interested parties through the author.

An executive summary will also be written and provided to study participants, and the agencies they represented (e.g., NMFS, DPNR, CFMC). Because there are few reports of this scale currently available regarding St. Croix’s fishers and fisheries management, several agencies and independent researchers have intermittently contacted me in order to receive the study results. Executive summaries or the full dissertation will be provided in all cases.

If funding allows, I would like to present the results of the study in person in St. Croix to study participants, agency representatives, and interested members of the public. Additionally, the findings will be presented at several academic and practical conferences and symposia over the next few years.
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Yelvington, Kevin A.

Zann, Leon P.

Zarger, R. K.

Zimmerer, Karl S.

## LIST OF ABBREVIATIONS

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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>ACL</td>
<td>annual catch limits</td>
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<tr>
<td>AP</td>
<td>advisory panel</td>
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<tr>
<td>BIRNM</td>
<td>Buck Island Reef National Monument</td>
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<tr>
<td>CBRM</td>
<td>community-based resource management</td>
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<tr>
<td>CCR</td>
<td>commercial catch report</td>
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<tr>
<td>CFMC</td>
<td>Caribbean Fishery Management Council</td>
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<tr>
<td>CWA</td>
<td>Clean Water Act</td>
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<tr>
<td>CZM</td>
<td>Division of Coastal Zone Management</td>
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<td>DEE</td>
<td>Division of Environmental Enforcement</td>
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<td>DFW</td>
<td>Division of Fish and Wildlife</td>
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<td>DPNR</td>
<td>Department of Planning and Natural Resources</td>
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<tr>
<td>DWI</td>
<td>Danish West Indies</td>
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<tr>
<td>EEZ</td>
<td>exclusive economic zone</td>
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<tr>
<td>ENGO</td>
<td>environmental non-governmental organization</td>
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<tr>
<td>FAC</td>
<td>Fisheries Advisory Committee</td>
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<tr>
<td>FAO</td>
<td>United Nations Food and Agricultural Organization</td>
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<tr>
<td>FMP</td>
<td>fishery management plan</td>
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<tr>
<td>GIS</td>
<td>geographic information systems</td>
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<td>GTP</td>
<td>gross territorial product</td>
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<tr>
<td>HOVIC</td>
<td>Hess Oil Virgin Islands Corporation</td>
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<tr>
<td>IATTC</td>
<td>Inter-American Tropical Tuna Commission</td>
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<tr>
<td>ICNAF</td>
<td>International Commission for the Northwest Atlantic Fisheries</td>
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<tr>
<td>ITQ</td>
<td>individual transferable quotas</td>
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<tr>
<td>LEK</td>
<td>local ecological knowledge</td>
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<td>MSA</td>
<td>Magnuson-Stevens Fisheries Conservation and Management Act</td>
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<td>NEFMC</td>
<td>New England Fishery Management Council</td>
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<td>NEPA</td>
<td>National Environmental Policy Act</td>
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<td>NGO</td>
<td>non-governmental organization</td>
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<td>NMFS</td>
<td>National Marine Fisheries Service</td>
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<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
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<td>NPS</td>
<td>National Park Service</td>
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<td>NS8</td>
<td>National Standard 8</td>
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<td>SCCFA</td>
<td>St. Croix Commercial Fishermen’s Association</td>
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<td>SFA</td>
<td>Sustainable Fisheries Act</td>
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<td>SIA</td>
<td>social impact assessment</td>
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<td>SSC</td>
<td>Science and Statistical Committee</td>
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<td>US</td>
<td>United States</td>
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<td>USF</td>
<td>University of South Florida</td>
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<td>Description</td>
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<td>United States Fish and Wildlife Service</td>
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<td>USVI</td>
<td>United States Virgin Islands</td>
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<td>VICO</td>
<td>Virgin Islands Company</td>
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<td>VIRIL</td>
<td>Virgin Islands Rum Industries Limited</td>
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<tr>
<td>VIRRR</td>
<td>Virgin Islands Rules and Regulations</td>
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