Chapter 9
COMMUNITY PROFILES OF HMS FISHERIES

9.1 Introduction to the Community Profiles

The Magnuson-Stevens Act requires all fishery management plans (FMPs) to include a fishery impact statement, which shall assess, specify and describe the likely effects of the measures on fishermen and fishing communities (§303(a)). When establishing a limited access system for the fishery, such as that described in Chapter 4 of this FMP, one of the factors that must be taken into account is the cultural and social framework relevant to the fishery and any affected fishing communities (§303(b)(6)).

Similarly, the National Environmental Policy Act (NEPA) requires federal agencies to consider the interactions of natural and human environments by using "a systematic, interdisciplinary approach which will ensure the integrated use of the natural and social sciences ... in planning and decision-making" (NEPA §102(2)(a)). Federal agencies should address the aesthetic, historic, cultural, economic, social, or health effects which may be direct, indirect, or cumulative. Consideration of the social impacts associated with fishery management measures is a growing concern as fisheries experience variable participation and/or declines in stocks.

Social impacts are the consequences to human populations that follow from some type of public or private action. Those consequences may include changes in "the ways in which people live, work or play, relate to one another, organize to meet their needs and generally cope as members of a society ... " (Interorganizational Committee on Guidelines and Principles for Social Impact Assessment, 1994:1). In addition, cultural impacts may involve changes in the values and beliefs that affect the way that people identify themselves within their occupation, their communities, and society in general. Social impact analyses help determine the consequences of policy action in advance by comparing the status quo with the projected impacts. Public hearings, scoping meetings, and Advisory Panel meetings provide input from those concerned with the impacts of a proposed management action.

The Magnuson-Stevens Act outlines a set of National Standards (NS) that apply to all fishery management plans and the implementation of regulations. Specifically, NS 8 notes that:

> "Conservation and management measures shall, consistent with the conservation requirements of the Magnuson-Stevens 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: (1) provide for the sustained participation of such communities; and, (2) to the extent practicable, minimize adverse economic impacts on such communities." (§301(a)(8))
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> "Sustained participation" is defined to mean continued access to the fishery within the constraints of the condition of the resource. It should be clearly noted that NS 8 "does not constitute a basis for allocation of resources to a specific fishing community nor for providing preferential treatment based on residence in a fishing community." The Magnuson-Stevens Act further defines a "fishing community" as:
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> " ... a community that is substantially dependent upon or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and

includes fishing vessel owners, operators, crew, and fish processors that are based in such communities." (§3)

While geographic location is an important component of a fishing community, management measures often have the most identifiable impacts on fishing fleets that use specific gear types. In addition, since the large pelagic species in this FMP are highly migratory, fisheries and the people involved may shift among geographic locations to follow the fish. The geographic concentrations of HMS fisheries can vary from year to year as the behavior of these migratory fish is somewhat unpredictable. Thus, the relationship between these fleets and geographic fishing communities is not always a direct one; it is an important variable for understanding social and cultural impacts. Therefore, the definition of community takes into account both geographic factors and the use of a specific gear type in HMS fisheries.

NMFS (1994) guidelines for social impact assessments specify that the following elements are required in the development of FMPs and FMP amendments:

1. Information on distributional impacts, non-quantifiable considerations such as expectations and perceptions of the alternative actions, and the potential impacts of the alternatives on both small economic entities and broader communities;

2. Descriptions of the ethnic character, family structure, and community organization of affected communities;

3. Descriptions of the demographic characteristics of the fisheries;

4. Descriptions of important organizations and businesses associated with the fisheries;

5. Identification of possible mitigating measures to reduce negative impacts of management actions on communities.

9.2 Methodology

NMFS contracted with Dr. Doug Wilson, from the Ecopolicy Center for Agriculture, Environmental and Resource Issues at Rutgers, the State University of New Jersey, to help develop this information for the HMS FMP and Amendment 1 to the FMP for Atlantic Billfish. Dr. Wilson and his colleagues completed their field work in July 1998. This study covered four species groups (tunas, swordfish, sharks and billfishes) that have important commercial and recreational fisheries extending along the Atlantic and Gulf coasts from Maine to Texas and in the Caribbean. The study investigated the social and cultural characteristics of fishing communities in five states and one U.S. territory: Massachusetts, New Jersey, North Carolina, Florida, Louisiana, and Puerto Rico. These areas were selected because they each had important fishing communities that could be affected by the HMS FMP and Atlantic Billfish FMP Amendment, and because they are fairly evenly spread along the Atlantic and Gulf coasts and the Caribbean. For each state or territory, a profile of basic sociological information was compiled, with at least two coastal communities visited for further analysis. Towns were selected based on HMS landings data, the relationship between the geographic communities and the fishing fleets, and the existence of other

community studies. Finally, the Advisory Panels for HMS and Billfish provided extensive input on which fishing communities should be included in this analysis.

In order to determine the potential regulatory impacts of the HMS FMP, researchers from Rutgers University traced six HMS fisheries: the pelagic longline fishery, the shark bottom longline fishery, bluefin tuna purse seine fishery, drift gillnet swordfish fishery, the rod and reel bluefin tuna fishery (commercial and recreational), and the recreational shark fishery. The recreational billfish fishery and the Puerto Rican deep water artisanal fishery were also studied to determine the potential impacts of Amendment 1 to the Billfish FMP. The following towns were visited for in-depth analysis of the five HMS fisheries mentioned above: Gloucester, MA; New Bedford, MA; Barnegat Light, NJ; Brielle, NJ; Wanchese, NC; Hatteras, NC; Madeira Beach, FL; Panama City, FL; Islamorada, FL; Pompano Beach, FL; Dulac, LA; Venice, LA; and Puerto Rico. The overall potential impacts on HMS fishing communities from the various management alternatives were determined based on quantitative social data and qualitative information from the interviews of Wilson, *et al.*, and from comments received in regional public hearings and the HMS AP on the proposed rule and the draft HMS FMP.

Researchers from Rutgers conducted more than a hundred key informant interviews throughout these communities, with fishermen, fishing crew, processors, dealers, leaders of fishing organizations, and suppliers. These key informant interviews were guided discussions in which the interviewer moved the interview from topic to topic. The interviewer asked many specific questions as issues arose, but also tried to allow the respondent to shape the terms in which the issues were framed. This line of questioning helped to reveal not just the respondent's perceptions of what is happening, but the meaning which the respondent attached to these perceptions. Constraints on time and money precluded a more complex statistical design, but even the most complete research design would have used the same types of interviews.

Qualitative interviews such as these are valuable in determining people's perceptions, but are less precise than formal quantitative surveys. Evaluating the accuracy of the responses is done by what social scientists call "triangulation." If several people respond differently to the same issue, the researchers then either do not report anything, or report that people disagree. If several people who are all in the same fishing sector make a similar statement, especially when the interviewer does nothing to lead the statement with a question, then researchers consider this an accurate reflection of how that part of the industry sees the issue. If there is confirmation from someone who does not share that group's economic interest in the fishery, that provides additional evidence of what is going on in the community. Results are further confirmed when researchers hear a similar response in community after community from people in different parts of the industry.

Based on possible changes to the regulations, researchers identified three categories of potential impacts on fishing operations. First, fishing regulations can affect the *volume* of money that is going through the community. In commercial operations this is a function of the amount and price of fish, as well as the money spent while taking those trips. In recreational operations this is a function of the amount people are willing to pay for a fishing experience and the number of trips taken. Second, regulations can affect the *flexibility* of fishing operations. This is the ability of the operation to change in response to changes in the resource, the market, or their customer base. Regulations may create uncertainties that affect the ability of fishing operations to make business plans. This often has more to do with how the regulation is administered than the regulation itself. Finally, regulations can impose *direct costs* on fishing operations by requiring them to buy something or to pay someone to do something, or by changing the way they operate (e.g., a higher minimum size may force fishermen farther offshore.)

Researchers used these three categories to organize the proposed alternatives into manageable units. Quotas, size limits, and bycatch limits were considered under "Volume" impacts, although the report differentiates between the quotas themselves and the derby-style effects of quota systems. Time/area closures, controls on soak time, prohibitions, and other gear restrictions were considered under "Flexibility." Vessel Monitoring Systems, permits, reporting, and industry-financed observers were considered under "Direct Costs." These impacts on fishing operations create impacts in the broader community. Impacts on employment and overall wealth are important, as are changes in a community's identity as a fishing community, and its perspective on the future of fishing-related activities. Social relationships such as the role of kinship and the aggressiveness of competition also affect the quality of life in the community.

The magnitude and importance of any impact is also a function of the characteristics of the fishing community. One is the existence of *alternative activities*, both fishing and non-fishing. The more alternatives available to someone who must change their behavior because of a regulation, the better that person is able to deal with the change. The second community characteristic is *economic vulnerability*. This describes the amount and sources of pressure and competition faced by fishing-related businesses striving for profitable operations. The greater the vulnerability of the fishing operation, the greater the impact of a regulation on the lives of the people connected to that operation. The third characteristic is *community support*. Communities differ in the degree to which social capital, i.e., networks of people able to provide financial or emotional assistance, is available to people and fishing operations. The more community support, the better the communities can absorb any adverse impacts of fishing regulations. Information included in the report summarizes the views and opinions of the individuals and groups surveyed, and must be evaluated in terms of the survey design and sample size relative to the operational scope of HMS fisheries.

The following community descriptions are organized by State. As noted above, much of the information in this assessment is attributed to the research findings of Wilson *et al*. Several other Chapters in this FMP include information that is an integral part of this social impact assessment. Please refer to the Description of the Fisheries in Chapter 2, as well as the Regulatory Impact Review (RIR) and the Final Regulatory Flexibility Analysis (FRFA) in Chapter 7. In addition, each of the management alternatives in Chapter 3 includes an assessment of the potential social and economic impacts associated with each alternative. NMFS has conducted these analyses and

selected the final alternatives in order to minimize economic impacts and provide for the sustained participation of fishing communities, while taking the necessary actions to rebuild overfished fisheries as required by the Magnuson-Stevens Act. Consistent with NS 8, this Chapter first identifies and describes HMS fishing communities (both on the basis of geographic location and gear type of the fisheries) and then provides a qualitative assessment of their differing nature and the potential social and cultural impacts of the final actions in this FMP.

9.3 Massachusetts Community Profiles

Demographic Profile of Massachusetts (Source: U.S. Bureau of the Census, 1990)

Population: 6,016,425

Education: Nearly 80 percent of residents 25 and older graduated from high school

Employment: 6.7 percent of the civilian labor force is unemployed

Main sources of employment: Retail (16 percent of the workforce); manufacturing durable goods (12 percent); health services (ten percent); and agriculture, forestry, and fisheries (one percent)

Per capita income (1989): $17,224

Characteristics of Fisheries in Massachusetts:

In 1996, commercial bluefin tuna landings in Massachusetts totaled approximately 1.5 million pounds, accounting for over 70 percent of the total bluefin tuna landings in the Atlantic and Gulf States (NMFS, Bluefin Tuna Database). Gross revenues generated from these landings were $13 million, representing 78 percent of the total for bluefin tuna in the Atlantic and Gulf states. Commercial swordfish landings totaled approximately 1.1 million pounds, accounting for 23 percent of the total swordfish landings in the Atlantic and Gulf states. The gross ex-vessel revenue of these landings was $3.4 million, representing 22 percent of the total for swordfish landings in the Atlantic and Gulf states. Commercial landings of sharks totaled over 80,000 pounds, with ex-vessel gross revenues of nearly $69,000. Expenditures by saltwater anglers were approximately $221 million, nearly three percent of the total U.S. expenditures by saltwater anglers, though it is unknown what percentage of that amount was spent on HMS fisheries. Saltwater fishing in Massachusetts had an economic output of $425 million (less than two percent of the U.S. total), generated wages and salaries of $119 million and created 4,957 jobs (ASA, 1997).

Communities in Massachusetts that are likely to be affected by the HMS FMP include fisheries in the following towns: Boston, Chatham, Harwich/Harwich Port, Fairhaven, New Bedford, Gloucester, Green Harbor, Nantucket, Newburyport, Provincetown, and Sandwich (Table 9.1). Researchers chose to study the fishing communities of Gloucester and New Bedford. Together, Gloucester and New Bedford account for more than half of

New England's large vessel fleet, more than one-half of the ex-vessel gross revenues of the overall catch and almost two-thirds of New England's fish-processing activity (Doeringer *et al*. 1986). Gloucester and New Bedford are large ports with strong ethnic affiliations among their fishing populations. Recently, Gloucester landings have accounted for the greatest quantity of commercial sized bluefin tuna (greater than 73 inches) in Massachusetts (approximately 200 mt). Gloucester also has the greatest number of tuna permits holders in Massachusetts. Substantial bluefin tuna landings are made in New Bedford, which also has among the highest landings of swordfish and large coastal sharks in the state (Table 9.2).

Table 9.1 Demographic characteristics of Massachusetts communities affected by the HMS FMP. (U.S. Bureau of the Census, 1990)

Community	1990 Census Population	Sex Ratio M/F	% of Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry and Fishing Industry
Boston	574,283	0.91	31.2	75.7	8.3	$15,581	0.5
Chatham	6,579	0.86	52.7		4.4	$18,471	9.8
Harwich/Harwich Port	10,275	0.87	58.7	87.8	9.0	$15,020	3.4
Fairhaven	16,132	0.93	59.1	68.2	7.6	$13,114	2.9
New Bedford	99,922	0.88	49.7	49.7	12.2	$10,923	3.2
Gloucester	28,716	0.93	52.2	75.6	6.8	$16,044	3.8
Green Harbor	2,205	0.95	64.4	96.1	6.4	$16,944	0.7
Nantucket	3,069	0.93	45.7	90.4	1.8	$21,139	4.3
Newburyport	16,317	0.89	50.8	85.3	6.0	$19,008	0.6
Provincetown	3,561	0.97	27.2	82.0	17.6	$14,955	4.3
Sandwich	15,489	0.97	68.9		4.4	$17,412	3.4

Table 9.2 Fisheries characteristics of Massachusetts communities affected by the HMS FMP. (NMFS, 1997)

Community	**Bluefin Tuna Landings** ***dressed wt in metric tons (mt)***	**Bluefin Tuna Landings** ***rank by weight***	**Commercial Tuna Permits** ***number***	**Commercial Tuna Permits** ***rank***	**Recreational Tuna Permits** ***number***	**Recreational Tuna Permits** ***rank***	**Swordfish Landings** ***# of fish***	**Swordfish Landings** ***rank***	**LC Shark Landings** ***# of fish***	**LC Shark Landings** ***rank***
Boston	1.3		114	6	11	2	327	3		
Chatham	19.1	9	169	3	3					
Harwich	48.7	4	98	9	1					
Fairhaven	1.9		36		6	5	618	1		
New Bedford	121.8	2	122	5	2		443	2	200	1
Gloucester	199.2	1	401	1	12	1	32	4		
Green Harbor	55.5	3	101	7	2					
Nantucket	1.3		46		7	4				
Newburyport	29.3	6	176	2	8	3	1	5	10	2
Provincetown	26.2	7	126	4	4	10				
Sandwich	47.4	5	71		1					

9.3.1 Gloucester

Gloucester is located on Cape Ann, approximately thirty miles northeast of Boston. Gloucester is known as the oldest American seaport, established in 1623. Even before settlement, European vessels fished the waters off Cape Ann for cod in the summer (NOAA, 1996). Today, Gloucester remains one of the main ports along the Atlantic coast of the United States. The working waterfront of Gloucester is the site of important economic activity in addition to the commercial fishing fleet. In recognition of its importance, the city strives to prevent residential development along the waterfront (Gloucester Narrative, 1998). Whale watching is also an important marine-related industry. The fishing communities of Gloucester have long and rich histories. While there are tensions growing between the recreational and commercial sectors, participants see themselves as members of the same community. Many people shift between or provide services to both of them. Researchers found that, on the whole, these communities are able to work together to respond to changes in the fisheries.

Private vessels fishing for bluefin tuna in Gloucester participate in a fishery that is difficult to categorize. The majority of the vessel owners who have General category permits might normally consider themselves recreational fishermen, although this permit allows commercial sale of catch. However, NMFS considers General category permit holders to be commercial fishermen. This commercial fishery is made up of part-time tuna fishermen as well as full-time professional commercial fishermen who also participate in other commercial fisheries, e.g., lobster. Some commercial fishermen prefer that restricted-fishing days and closures include weekend days because of crowding problems.

One conflict in Gloucester is that between professional bluefin fishermen and part-time fishermen, who are often referred to as “weekend warriors” (Wilson *et al*., 1998). Although these part-time fishermen may not participate as comprehensively in the fishery as professional fishermen, the part-time fishermen argue that they do provide significant revenues to the local shoreside industry which is usually associated with the recreational fishing industry, e.g., tackle shops, marina berths etc. About 60 percent of the 300 year-round vessels at the largest marina have General category permits. During the bluefin tuna season, 30 to 50 vessels will come just to fish in the General category for the season. Often fishermen and their families participate in other tourist attractions, adding to the community-wide economic benefits that come from the bluefin tuna fishery.

There is also a small fleet of about ten vessels in Gloucester that harpoon bluefin tuna, mainly with the assistance of spotter planes. None of the vessel owners who use planes live in Gloucester (Wilson *et al*., 1998). Use of planes in the fishery is a highly divisive issue that has become increasing controversial in recent years. NMFS attempted to ban the use of spotter planes in all categories except the harpoon and purse seine categories but was overturned in court. During Advisory Panel meetings and public hearings the issue of banning spotter planes is continually raised with the vast majority of fishermen supporting a prohibition. Refer to Section 3.4.2.1.1 of the FMP for a discussion of this issue.

Gloucester is also an active port for species other than HMS. Year-round groundfishing is the dominant fishing activity, and though not as prominent, inshore lobstering is also a major fishing activity in Gloucester (NOAA, 1996). The Gloucester charterboat fleet consists of about 15 vessels in two marinas. Charter fishing starts in April for cod, mackerel, haddock, and pollock; fishing for bass begins in May and continues all summer; offshore cod fishing is another summer fishery. There are a few other minor species. Most of the Gloucester charter captains work at other jobs during the off season (many are teachers).

Demographic Profile of Gloucester (Source: U.S. Bureau of the Census, 1990)

Population: 28,716. Estimates for 1996 indicate a five-percent increase since 1990. Approximately 48 percent male; 52 percent female.

Racial and Ethnic Composition: 99.4 percent Caucasian; the dominant cases of single ancestry in Gloucester are Italian (14 percent of the population), English (seven percent), Irish (six percent) and Portuguese (six percent).

Age Structure: 46 percent aged 15 to 44; 18 percent under age 15; 36 percent above age 44.

Marital Status: 56 percent married; 27 percent never-married; eight percent divorced; and nine percent widowed. Of those widowed, 82 percent are female and 18 percent are male.

Household Composition: 11,550 households; average of 2.47 persons per household.

Educational Trends: Of people 25 years and older, 75.5 percent are high school graduates. Fishermen often finish formal schooling by the time they reach fifteen; this is especially true for those fishermen who are immigrants (Hall-Arber, 1996). The majority of active fisherman are not formally well-educated, but rather are educated in the "school of hard knocks" as one man put it. Consequently, fishermen would generally be at a disadvantage in competition for alternative occupations (Hall-Arber, 1993).

Per Capita Income: $16,044; this is considerably higher than the per capita income for New Bedford ($10,923), although fishermen's incomes in Gloucester tend to be lower than those of New Bedford fishermen (Hall-Arber, 1996).

Employment: Of the active labor force, 6.8 percent are unemployed. Thirty-three percent of the population over 16 do not participate in the labor force. Of the employed labor force, 53 percent are men and 47 percent are women. Approximately 27 percent of jobs in Gloucester are managerial/professional, 28 percent are technical/administrative, and 2.8 percent are farming, forestry, and fishing related. However, when support industries such as ice companies and seafood dealers are taken into consideration, 40 percent of Gloucester's economy is somehow related to fishing (Hall-Arber, 1996). Attempts to diversify within as well as outside the fishing industry has given Gloucester a sense of optimism towards its economic future (Wilson *et al*., 1998). Gloucester is encouraging development in the light manufacturing and tourism industries as well as seafood marketing.

Fishing Organizations: One of the most prominent fisheries organizations in Gloucester is the Gloucester Fishermen's Wives Association (GFWA). The GFWA, established in the late 1960s, offers support to the fishing and seafood industry. Other organizations include: Cape Ann Gillnetters Association; Cape Ann Vessel Association; East Coast Tunas Association; General Category Tunas Association; Gloucester Fisheries Association; North Shore Community Tuna Association; and the Gulf of Maine Fishermen's Association.

The Bluefin Tuna Purse Seine Fishery

The Atlantic bluefin tuna purse seine fishery lasts for only a few weeks each year and is limited by regulation to five vessels. There is one purse seine vessel that operates out of Gloucester. The participating vessels either remain at dock or engage in alternative fisheries during the rest of the year. The economic health of the purse seine fishery is heavily dependent on bluefin tuna prices and, concomitantly, on the value of the Japanese yen. Finding crew is not a problem; many of the current crew members have had their berths for years. The owner and many of the crew of purse seine vessels, even some who do not reside in the community, are well-integrated through kinship ties into the fishing community. They see themselves as responsible for creating the bluefin tuna fishery and the fleet enjoys the respect of the extended fishing communities in Gloucester (Wilson *et al*., 1998).

When questioned about proposed management measures, participants reported that a reduction in quota allocation and a higher minimum size for bluefin tuna would reduce the income of this fleet. However, because the fleet has already adjusted to a very short season, it would continue to fish its quota unless reductions were very large (Wilson *et al*., 1998). The researchers concluded that the impact of reductions of this quota on the fishing community would not be as great as the impacts of reductions in other bluefin tuna fisheries. However, the effect on community attitudes would be significant unless such cuts were across-the-board, since many would view them as unfair. See Section 2.2.4 for a description of the social and economic aspects of the bluefin tuna fishery.

Bluefin tuna dealers in Gloucester work with a large number of vessels of various types, including the one purse seine vessel. Most bluefin tuna are sold on consignment, and some dealers give a minimum guarantee on fish they take. Personal networks are very important and competition can be very fierce. During the bluefin tuna season, some transient dealers come to Gloucester. The largest dealer buys from the purse seine vessels because it is one of the few dealers that is able to finance the transaction. This business has only one full-time employee and up to seven seasonal employees, who may be fishermen who cannot get work. The dealer to whom the purse seine vessel sells its bluefin depends heavily on that vessel to maintain its current profit margins. However, this dealer reports that the structure of its business is such that there would be no lost jobs even if the purse seine landings were significantly reduced, since reallocated bluefin tuna would likely be handled by the same dealer.

The Rod and Reel Tuna Fishery

Commercial rod and reel tuna fishing (with General category permits) as well as recreational rod and reel tuna fishing (with Angling permits) drive a large shoreside economy, including the sale and repair of tackle, vessels, and engines, and the sale of supplies such as bait and ice. The rod and reel fishery also supports general tourist services such as restaurants and hotels. This community is competing with many other possible tourist destinations for tuna fishermen, increasing their dependence on the bluefin tuna as a prominent attraction. Vulnerabilities stem from the seasonal nature of tuna fishing in Gloucester and the general dependence of tuna fishing on the health of the economy. According to those interviewed, seasonality makes business planning, as well as finding and retaining trained employees, more difficult.

The bluefin tuna rod and reel fishery attracts wealthier fishermen than the fisheries for many other species. The bluefin tuna fishing experience is not always a family activity, but it is often the attraction that brings an adult, and hence the rest of the family, to the community. It attracts experienced and amateur fishermen alike, as well as adventure seekers who are often outdoors enthusiasts in other arenas. Gloucester used to have an annual bluefin tuna tournament organized by the largest of the recreational marinas. However, limited availability of fish has canceled the tournament for the past four years (Wilson *et al.*, 1998). Most fishing tourists who come to Gloucester are from the northeastern United States.

The Gloucester charter fleet follows a standard policy that when a bluefin tuna is landed, the fish belongs to the vessel and the charter for the day is free, since the vessel operator may sell the fish to the dealer (Wilson *et al.*, 1998). Serious customers want to target bluefin tuna, even though there is a low probability that they will catch them. Very often when the General category is open, charter captains will take an extra mate and fish for bluefin tuna without paying passengers. They feel that having no amateurs on board enhances their chances of actually landing a fish.

According to those interviewed, seasonal closures of the bluefin tuna fishery have a dramatic effect on Gloucester's economy, as fishermen from other states often leave when the season closes. Some individuals commented that the uncertainty of the season makes planning difficult. Table 9.3 shows the effects of restricted fishing days on the fuel sales at a large marina in Gloucester that serves both private and charterboats. Overall, sales on restricted fishing days average 33 percent less than those on days when the bluefin tuna fishery was open. The importance of "weekend warrior" bluefin tuna fishermen is also evident, since 48 percent of fuel sales take place on weekends. Closures that take place on weekdays cause a 24-percent drop in sales, while closures on weekends cause a 33-percent drop in sales. Finally, people often fuel their vessels the day before they fish. If open days just before restricted fishing days are also considered as restricted fishing days, fuel sales decrease by 40 percent.

Table 9.3 Average daily vessel fuel sales at a Gloucester marina (US$). Figures are from July to August 1997. "Include Lag" column includes the day before a closure in the closed category.

Status	All Days	Weekends	Weekdays	Include Lag

Open	2510 N = 30	4059 N = 10	1736 N = 20	2747 N = 24
Closed	1677 N = 32	2737 N = 8	1324 N = 24	1650 N = 38

Of the three retail tackle shops in Gloucester, only one specializes in offshore fishing. Eighty-five percent of its business is related to both commercial and recreational bluefin tuna fishing. The shop owner indicates that restricted fishing days are good for business, since vessel owners come in to purchase supplies and request repairs. Bluefin tuna and shark fishing gear is very expensive; reels cost $800 to $1000 and are useful for shark and bluefin tuna only. Fishermen in Gloucester often choose high quality gear and show little concern about price (Wilson *et al*., 1998).

When questioned about proposed management measures, respondents expressed great concern about bluefin tuna allocation among regions. This concern extended to proposed changes in the minimum size for bluefin tuna, season opening dates, and recreational retention limits. They felt that any positive impact on one region would mean a negative impact on another. Respondents emphasized that shifting regional allocations to the point of changing people's expectation of landing a bluefin tuna would be particularly destabilizing. They also noted that charter businesses need to know as far ahead of time as possible when the fishery will be open in their geographic area.

In the HMS rod and reel fishery of Gloucester, sharks are usually not the primary target species, but they are encountered incidentally to tunas. Most sharks caught in Gloucester recreational fisheries are released (Wilson *et al*., 1998). Researchers noted tension and distance between the recreational and commercial fishing communities, as recreational fishermen tend to believe that commercial fishing is to blame for the declining shark populations.

Community Impacts in Gloucester, Massachusetts

The final actions in this FMP provide for sustained participation in the fishing communities of Gloucester, while minimizing economic impacts to the extent practicable. The ICCAT Rebuilding Program for bluefin tuna is unlikely to have any social impacts on the rod and reel fishing community in Gloucester, since the U.S. quota will not change substantially and this FMP maintains status quo allocation patterns. In fact, the commercial handgear categories could experience a slight increase in revenues from bluefin tuna landings. Since the purse seine allocation is capped at 250 mt, the purse seiners may not experience a similar expansion in revenues, but the Rebuilding Program is not likely to have social impacts on the purse seine fishing community of Gloucester.

Expanding the list of prohibited shark species to include dusky sharks may have some social impacts for this community by essentially establishing a catch and release fishery for this trophy species. The other species included in the prohibited species management unit are unlikely to have any social impacts on the rod and reel fishery in Gloucester because most

fishermen do not harvest these species. Additionally, the final action decision not to add blue sharks to the prohibited species management unit should minimize social impacts. Establishing a minimum size of 4.5 feet in the recreational fishery should have only minor social impacts in Gloucester because most sharks harvested in this fishery are larger than this minimum size. However, this action may have substantial social impacts for nearshore anglers by essentially establishing a catch and release fishery for sharks in near-shore waters. Reducing the recreational retention limit may have some social impacts by limiting charterboat and tournament anglers who want to retain their shark catches; however, researchers have noted an increasing catch-and-release ethic among anglers which may mitigate any negative impacts. Overall, the final actions for sharks under this FMP are likely to have minor social impacts on the recreational fisheries in Gloucester.

Most charter/headboats in Gloucester already have a permit for targeting tunas, so the rod and reel community will not be affected by the new requirement to obtain a charter/headboat permit for all HMS. Mandatory tournament registration for all HMS may impose an additional burden on shark and tuna tournament operators who were not previously reporting on the billfish tournament forms, but overall, the social impacts on the Gloucester rod and reel community are likely to be minimal.

9.3.2 New Bedford

New Bedford is a long and narrow city along the coast of southern Massachusetts, facing the city of Fairhaven across the water. Although it was recently named among the top ten "green cities" in the country (New Bedford Narrative, 1998), New Bedford faces the problems associated with its urban setting, such as low education levels and high unemployment. The working waterfront and its industry have become increasingly important economically as the manufacturing base of the city has declined. With multiplier effects, the city's economy may benefit from the fishing industry by $500 million (Wilson *et al*., 1998). Approximately 2,000 people are directly employed as fishermen, nearly ten percent of the 20,997 males employed in New Bedford. Thousands of other people are employed in supporting services such as processing, manufacturers of equipment, transport companies, supply houses, oil companies, welders, pipe fitters, stores, settlement houses, etc. Once the "whaling capital of the world," New Bedford still possesses one of the largest fishing fleets in the eastern United States (NOAA, 1996). NMFS reports that approximately 412 vessels land in New Bedford annually, though of these many are transient vessels that land only in summer months. Approximately 280 vessels use New Bedford as their home port (Wilson *et al*., 1998).

The offshore recreational fishing industry in New Bedford primarily targets bluefin tuna and sharks. Charter customers in New Bedford come from all over the country and schedule their trips well in advance. There are nine marinas in New Bedford harbor, which also includes Fairhaven. There are about seven charterboats in the harbor of which two specialize in offshore fishing. None of them specialize in particular species. As in Gloucester, it is customary for the operator of a charterboat/headboat to keep a bluefin tuna caught during a charter trip. For sharks and bluefin tuna, some captains impose size limits which are more

stringent than the existing limits, including those implemented under this FMP (Wilson *et al*., 1998).

New Bedford has learned a great deal about how to survive crises in fisheries. Many of the members of this fishing community are descended from Portuguese fishing families and kinship networks are an extremely important influence on employment patterns in the fishing industry (Doeringer *et al*., 1986). The Portuguese families are very close and many trace their families back to fishermen in Portugal. The Fishermen's Family Center opened in 1994 with help from the federal government in response to the collapse in the groundfish fishery. Thirty-two vessels in New Bedford were removed through the buyback program. With help from the Center, ex-fishermen are finding jobs, particularly in the marine trade, computer, and trucking industries. The marine trade jobs tend to be in New York, New Jersey, and Massachusetts. Other industries in New Bedford have been supportive of the fishermen through the crisis and extended family networks have helped minimize social impacts.

Demographic Profile of New Bedford (Source: U.S. Bureau of the Census, 1990)

Population: 99,922. Estimates for 1996 population indicate a decrease in population by three percent since 1990; approximately 47 percent male and 53 percent female.

Racial and Ethnic Composition: 88 percent Caucasian, four percent African-American, less than one percent of American Indian and Asian races each. By far the most dominant ethnic group in the community is the Portuguese, accounting for nearly 36 percent of the population.

Age Structure: 44 percent aged 15 to 44; 21 percent under age 15; 35 percent above age 44.

Marital Status: 49 percent married; 27 percent never-married, eight percent divorced; and ten percent widowed. Of those widowed, 85 percent are female and 15 percent are male.

Household Composition: 38,646 households; average of 2.51 persons per household.

Educational Trends: Of people 25 years and older, 49.6 percent are high school graduates. Fishermen often finish formal schooling by the age of 15; this is especially true for those fishermen who are immigrants (Hall-Arber, 1996). Over 30 percent of the population has not attended school beyond ninth grade.

Per Capita Income: $10,923; this is considerably lower than the per capita income reported for Gloucester ($16,044), although fishermen's incomes in New Bedford tend to be higher than those of Gloucester fishermen (Hall-Arber, 1996).

Employment: Unemployment rate is 12.2 percent of the labor force. Less than one percent of the employed work force is in the armed forces. In the civilian employed population, 52 percent are male workers and 48 percent are female workers. Forty percent of the residents over 16 do not participate in New Bedford's labor force. Of the employed population, 75

work in private, for-profit companies, 15 percent work for the government, and four percent are self-employed. Of occupations reported in the 1990 Census, 27 percent are technical/administrative, 26 percent are operators, fabricators and laborers, and nearly three percent are farming, forestry, and fishing related.

Once an essential industry in New Bedford, the textile industry has since closed many factories, contributing to the downturn in the city's economy (Hall-Arber, 1996). Another strain in the local economy has been caused by the departure of the Polaroid plant, considered to be a major employer. Due to the restricted fisheries, employment has declined not only in harvesting but also in seafood processing (Hall-Arber, 1996).

Fishing Organizations: There are numerous fisheries organizations located in this area including: East Coast Tuna Association; New Bedford Seafood Industry Coalition; Offshore Mariners' Association, Inc.; Offshore Mariners' Wives Association, Inc.; Seafarers International Union; and Seafood Dealers Association of New Bedford.

The Distant Water Pelagic Longline Fishery

All pelagic longliners that land HMS in New Bedford are large "distant water" vessels. The fleet consists of large vessels that follow swordfish throughout their migrations. These vessels make long trips, are relatively expensive to operate and are highly specialized to distant water fishing (i.e., they have large holds and additional fuel capacity). In general, these vessels have developed minimal history in other fisheries, though it is fairly easy for both the vessels and captains to find work in the longline business elsewhere in the world. Researchers found that many of these vessels have already moved from the Atlantic Ocean to the Pacific Ocean, and others are currently for sale. In summer months, these vessels fish on the Grand Banks and land swordfish in New England ports. During winter months, their product is initially landed in San Juan, PR and transhipped to New Bedford and other destinations. San Juan, PR is the only international airport in the Caribbean with the necessary lift capacity to tranship their product. Long storage time at sea means that this fleet produces relatively lower quality swordfish, so they compete directly with cheaper imports for the low-end markets. Participants report concern over expenses and the decreased price of swordfish. (See Section 2.3.4 for a description of the economics of the swordfish fishery.)

Because of these problems and the pressures brought about by increased regulation and decreasing fish stocks, the distant water fleet has responded by taking longer trips. This has affected family life; wives of fishermen do not want to raise children essentially alone. While some members of this fleet, their suppliers, and their customers live in the New Bedford area, the distant water fleet is not attached to a geographical community in the same sense of other fleets. Participants in this fleet tend to be fairly isolated within the communities where they live, even when those communities are strongly integrated fishing communities like New Bedford. The wives of captains and crew who participate in the distant water fishery generally do not know each other well. New Bedford has a fishermen's wives association but it is mainly for older Portuguese women whose husbands are scallopers and draggers "who do only 14-day trips" (Wilson *et al*., 1998). New Bedford respondents

not associated with the distant water fleet report that they see it as socially distant from the rest of the community. This isolation from other fishing people, and the length of the trips, has placed a strain on the family life of participants.

The distant water fleet has used its longer reach to recruit crew members from overseas, particularly the West Indies, thus avoiding crew supply problems typical of other sectors of the longline fleet. The range of these vessels over many different waters makes them particularly dependent on the skill and experience of their captains. New Bedford does not offer these captains alternative employment outside of the fishing industry at comparable income levels. Recent trips have not been remunerative for crew. Assuming 18-hour days, the last eight trips (267 days at sea) of the largest vessel in the fleet paid their highest paid crew an average of $5.25 an hour.

A dealer in the New Bedford area who purchases from the distant water fleet does $15 to 20 million worth of business each year, which includes imports. About half of the dealer's purchases are domestic. Overall, his business consist of 60 percent swordfish, 15 percent tunas (yellowfin, bigeye, bluefin), ten percent lobster, and 15 percent other (sharks, bait, etc.). The dealer employs 40 to 65 people depending on supply conditions.

When fishing is disrupted through closures, the dealers experience large labor fluctuations. Even the increased reliance on imports has not completely solved this problem. When they make an effort to buy from U.S. vessels in distant waters, special arrangements and timing that are required to get the fish to market and maintain vessels. The fishermen have to unload close to an international airport with the lift capacity, which in the Caribbean means San Juan. The dealers have to hire people to unload any vessel landings in San Juan, and send supervisors so that the fish is kept cold, weighed properly and counted correctly. Then they need to arrange for cargo departure and negotiate freight weight. These activities are easily disrupted by the short lead time of seasonal closures and other regulatory decisions.

When questioned about specific measures, participants reported that limitations on soak time and length of the mainline would take additional time and increase the cost of landing a fish, potentially decreasing their productivity. Fishery participants felt that commercial retention limits pose a significant disadvantage for them, given the duration of their trips and the distance they travel. Delaying offloading after closures is very important to these fishermen because the volume of their landings has a strong effect on price. These vessel captains were generally supportive of Vessel Monitoring Systems (VMS), which will allow delayed offloading, and some vessels already have VMS onboard.

Generally, researchers concluded that increased regulation of this fleet could lead to longer trips and increased strain on family life. Movement of vessels overseas would have some effect on the broader community through a reduction in the demand for maintenance and supply of vessels. These effects would be distributed along the coast and would not have a substantial impact on any one community. New Bedford longline fishermen express their greatest anger for fishing regulations which make them discard fish that would otherwise be marketable products.

The Pelagic Driftnet Fishery

NMFS prohibited the use of driftnet gear in the Atlantic swordfish fishery in January 1999. Prior to the ban, twelve vessels measuring 60 to 80 feet in length used 20- to 22-inch mesh driftnets to fish for swordfish. A few of these vessels have taken trips in the past to land tunas. These vessels have long histories in New Bedford and are very much a part of this fishing community. Some of these fishermen harpooned for swordfish in the past and shifted to driftnets in the late 1980s when declining stocks and competition from longliners made it more difficult to break even in the harpoon fishery. Others began driftnet fishing in response to the groundfish decline. The last new vessel entered the fishery in the 1993 to 1994 fishing season.

In the summer of 1998, all of the New Bedford driftnet vessels had permits in other fisheries, mainly groundfish, squid, butterfish, and summer flounder (see Chapter 2 for a description of HMS fisheries by gear type). Nevertheless, it was difficult for these captains to keep their crew employed year-round (Wilson *et al*., 1998). Respondents reported that cutbacks would lead to increased activity in the summer flounder, squid, butterfish, and whiting fisheries. These are traditionally New Jersey fisheries, and respondents anticipate this will lead to gear and crowding conflicts with both fixed and mobile-gear fishermen operating off of New Jersey.

When questioned about specific measures to reduce bycatch, respondents reported that closed areas would not have a major impact because they fish mainly in deeper waters. Participants reported that requiring acoustic deterrents and VMS would impose costs, but at a magnitude the fleet could absorb. The fleet has shown willingness to participate in developing acoustic deterrents for marine mammals. The pelagic driftnet fishermen feel that they have been unfairly associated with destructive, large scale driftnet fishing in the Pacific. They point out that their nets are fairly short (1.5 miles) and have a large mesh size.

Researchers found that elimination of driftnets in the swordfish and tuna fisheries would likely lead to increased activity in fisheries that are farther away. Longer trips could place increased strain on family life (Wilson *et al*., 1998). As a mitigating factor, New Bedford has had considerable experience dealing with fisheries crises. Public support for fishermen is strong in this community, including support for employing fishermen.

The Atlantic Bluefin Tuna Purse Seine Fishery

Of the five vessels that hold permits to fish in the bluefin tuna purse seine fishery, four are associated with New Bedford. One of these vessels is owned by a resident while the three other vessels are owned by non-residents. All four land their catch in New Bedford and have crew members who live in the city. The owners and many of the crew of the purse seine vessels, even some who do not reside in the community, are well-integrated through kinship ties into the fishing community. They are generally seen to be responsible for creating the bluefin tuna fishery, and the fleet enjoys the respect of extended fishing communities in New Bedford. Three of these vessels do nothing else but fish for bluefin tuna and are tied up at dock for the rest of the year. The fourth vessel holds a scallop permit as well. Many of the current crew members have had their berths for years. Together these vessels employ 26 crew members, 24 percent less than they did at the height of this fishery in the 1980s. Many of these crew members are family and almost all have been with these vessels for a long time. The average age is considerably older than that of most fishing crews. When the vessels are tied up, the crew members collect unemployment and do odd jobs. Crew members' wives generally work outside the home, whereas in the 1980s, they did not need to.

The purse seine fleet's economic health is heavily dependent on bluefin tuna prices and, concomitantly, on the value of the Japanese yen. The income for each of these vessels is lower than in the past because of declining prices and a lower bluefin tuna quota allocation. The last quota cut was 18.5-percent reduction in 1995 (from 301 mt to 250 mt, fleet wide). Those interviewed maintain that the reduced income has resulted in the use of fewer crew members and in reduced maintenance on the vessels, which has compromised safety to some extent. One vessel that would spend between $25,000 and $40,000 a year in a local shipyard now does so every other year. They are now at the point where "we only repair what breaks."

The New Bedford dealer who buys bluefin tuna from the purse seine fleet has been in business since the early 1960s. This dealer currently depends on the purse seiners to maintain profit margins. However, he reports that the structure of his businesses is such that there would be no lost jobs even if the purse seine landings were to be significantly reduced, since any bluefin tuna reallocated to other commercial categories would likely be handled by the same dealer. The business employs 200 people and would not lay off workers if the bluefin tuna quota were cut. While bluefin tuna currently makes up only 1.25 percent of their gross dollars, it accounts for 25 percent or more of their net profit.

People involved in the bluefin tuna fishery are most upset about the scientific theory that there are two stocks of bluefin tuna rather than a single stock that migrates between the west Atlantic, the east Atlantic, and the Mediterranean. They cited aerial surveys and the tagging data to support the single-stock theory. Several respondents who interact with European bluefin tuna fishermen and have visited their fishing grounds maintain that Europeans do not comply with conservation measures; therefore many U.S. fishermen feel that restrictions on the domestic fleet are unjust (Wilson *et al*., 1998).

When questioned about proposed management measures, participants reported that a reduction in quota allocation and a higher minimum size would reduce the income of this fleet. However, because the fleet has already adjusted to a short season, it would continue to fish its quota unless reductions were very large (Wilson *et al*., 1998). The researchers concluded that the impact of quota reductions on this fishing community would not be as great as the impacts of reductions in other bluefin tuna fisheries. However, the effect on community attitudes would be significant because, unless such cuts were made across-the-board, many would view them as unfair.

The Rod and Reel Tuna Fishery

The tuna fishing industry in New Bedford is a highly diverse one, with an increasing emphasis on providing an enjoyable fishing experience for all ages. Fishery participants feel that bluefin tuna fishing is an adventure, and the prize is an important aspect of the experience. It attracts experienced and amateur fishermen alike, as well as adventure seekers who are often outdoors enthusiasts in other arenas. Most charterboats in the New Bedford area are owner-operated. Respondents report that it can be hard to find suitable crew members because the business is seasonal and they are unwilling to hire unemployed commercial fishermen (Wilson *et al*., 1998).

Recreational fishing in these communities drives a much larger economy, including the marine trades (tackle, vessels, engines, etc.), suppliers of bait and ice, and general tourist services such as restaurants and hotels. These communities are competing with many other possible tourist destinations, increasing their dependence on large, well-known fish that act as prominent attractions. Economic vulnerabilities stem from the seasonal nature of recreational fishing in these communities and the general dependence of recreational fishing on the health of the economy. The seasonality of this fishery makes business planning, as well as training and keeping employees, more difficult. Respondents emphasized that these communities depend on potential customers' expectation that they will have a reasonable chance to land a fish.

When questioned about proposed management measures, respondents expressed great concern about allocation among regions. This concern extended to proposed changes in the minimum size for bluefin tuna, season opening dates, and daily catch limits. They felt that any positive impact on one community would mean a negative impact on another. Respondents emphasized that shifting regional allocations to the point of changing peoples' expectation of landing a bluefin tuna would be particularly destabilizing. They also noted that charter businesses need to know as far ahead of time as possible when the fishery will be open in their geographic area. Bluefin tuna fishermen are convinced that the numbers of fish are increasing and that the current management plan is working. While there are tensions between the recreational and commercial sectors, they understand themselves to be parts of the same community. Many people shift between or provide services to both of them. Membership in recreational fishing organizations are very common. Researchers found that, on the whole, recreational and commercial fishermen are able to work together to respond to changes in their fisheries.

The Recreational Shark Fishery

Shark tournaments are important in promoting business in the New Bedford area, attracting numerous repeat customers. They bring in curious people because sharks are considered a dangerous and exciting fish. Recreational shark fishing in New Bedford is mainly catch and release (Wilson *et al*., 1998). However, respondents argue that tournaments in this area cannot held with catch and release, because the length of the trip (100 miles) makes taking observers impractical. Although shark fishing is comparatively less important to recreational fishermen in this community, some customers are attracted by the particular challenge of shark fishing. Recreational fishermen throughout the area tend to believe that commercial fishing is to blame for the declining shark populations.

Community Impacts in New Bedford, Massachusetts

The final actions in this FMP provide for sustained participation in the fishing communities of New Bedford, consistent with the conservation requirements of NS 1, while minimizing economic impacts to the extent practicable. The ICCAT Rebuilding Program for bluefin tuna is unlikely to have any social impacts on the New Bedford rod and reel fishery, since the U.S. quota will not change substantially and this FMP maintains status quo allocation patterns. In fact, commercial handgear fishermen could experience a slight increase in revenues from bluefin landings. Since the purse seine allocation is capped at 250 mt, the purse seine community may not experience a similar expansion in revenues. The ICCAT Rebuilding Program for bluefin is unlikely to have any social impacts on the purse seine community of New Bedford.

Accounting for dead discards in swordfish management could result in an estimated 13-percent decrease in total revenues in the swordfish fishery, beginning in 2000. This estimate is based on the weight of 1997 dead discards relative to 1997 total mortality in the U.S. north Atlantic swordfish fishery. This measure may also affect the timing of closures of the directed fishery. If the United States can negotiate a ten-year ICCAT Rebuilding Program for swordfish, it could result in a 27-percent decrease in TAC for the United States; large negative impacts to revenues would be associated with this action. Some pelagic longline vessels that rely heavily on swordfish revenues will be forced to shift some effort to other fisheries or exit fishing altogether. Dealers in New Bedford may be forced to expand to other species if they have not already. The recent ban on driftnets in the swordfish fishery has forced approximately a dozen vessels to concentrate on other fisheries, predominantly trawling or groundfishing. This shift may be further intensified by the ban on driftnets in the tunas fishery that is established by this FMP. Displaced effort in the New Bedford community may shift to pelagic longlining for dolphin, wahoo, and BAYS tunas, or to the mackerel, squid and butterfish fisheries.

The requirement to have VMS onboard every pelagic longline vessel fishing for HMS will involve a substantial one-time cost ($1800 for unit plus $100 for installation) for the pelagic longline community in New Bedford, but this measure is necessary to implement time/area closures effectively. The VMS requirement is not likely to have significant social impacts on this community because many of the distant-water longline vessels based in New

Bedford already have VMS. Some positive social impacts can be expected to result from the VMS requirement because it will enable fishermen to communicate with their families and improve safety at sea. Together, the measures in the swordfish rebuilding plan are likely to have some social impacts on the pelagic longline community of New Bedford, but NMFS s that these actions are necessary to rebuild the swordfish fishery.

The limited access system implemented by this FMP may have minor social impacts on the distant water pelagic longline fleet in New Bedford; however, this system removes latent effort only and issues directed and incidental permits based on historical and current fishery participation. Directed permits will allow fishermen to operate under the quotas, seasons, and commercial retention limits established under this FMP. Lower retention limits for incidental permit holders are established that should allow fishermen to continue to land fish in quantities similar to current levels. Transferability of permits also allows fishermen flexibility in business planning.

The final action closing an area to pelagic longlining off the Mid-Atlantic coast from 39 to 40° N and 68 to 74° W during June will likely affect the longline fleet based in the New Bedford/Fairhaven area, although it is not expected to have a significant impact on landings of target species such as sharks, swordfish, and tunas other than bluefin. If fishermen decide to displace effort to other areas, fishing costs for fuel, bait, and ice may increase. In addition, travel time to the fishing grounds may increase. However, because the area is closed only for the month of June, this possible increase in fishing costs should not be significant. The time/area closure may also have an impact on entities such as seafood processors and other related businesses in the area. While fishing effort may be displaced to other locations, this action, given its short time-span, will most likely not have adverse impacts these communities.

There are also potential concerns regarding safety-at-sea associated with this time/area closure in the north Atlantic. NMFS received comments that the initially proposed four by four degree closed area would force vessels to travel through, and fish in, a dangerous area of the Gulf Stream. This was a particular concern for some of the smaller vessels which would have to travel farther with limited fuel capacity. The modification of the closed area to the selected one by six degree area should mitigate some of these concerns especially since the selected area does not include the dangerous area noted in most of the comments received on this issue. The final action is designed to preserve the ecological benefits of minimizing bluefin tuna discards, while minimizing social and economic impacts.

The expanded list of prohibited shark species, which now includes dusky sharks, may have some social impacts for the recreational shark fishery in New Bedford by essentially establishing a catch and release fishery for this trophy species. Although dusky sharks are rare in New England, they are sometimes targeted as a game fish. The other species included in the prohibited species management unit are unlikely to have any social impacts on the shark recreational fishery because most fishermen do not harvest these species. Additionally, the final decision not to add blue sharks to the prohibited species management unit should minimize social impacts.

Establishing a minimum size of 4.5 feet in the recreational shark fishery will have only impacts in New Bedford because most sharks harvested in this fishery are larger than this minimum size. However, this action may have substantial social impacts for nearshore anglers by essentially establishing a catch and release fishery for sharks in near-shore waters. Reducing the recreational retention limit may impact charterboat and tournament operations that want to retain sharks; however, researchers have noted an increasing catch-and-release ethic among anglers which may mitigate any negative impacts.

Commercial shark regulations that may impact New Bedford include establishing a separate quota for blue sharks and a separate species-specific quota for porbeagle sharks. However, the impacts are expected to be minor because the majority of blue sharks caught in the pelagic longline fishery can be released alive and the final action to reduce the pelagic shark quota by overharvests of blue sharks should create an incentive to maximize blue shark survival. The separate porbeagle shark quota should have negligible social impacts because the selected quota is ten percent higher than the highest estimate of recent landings; it is intended to prevent fishery expansion from current levels. Together, the final measures on sharks under this FMP will probably have minor social impacts on fisheries in New Bedford because there is little directed fishing on large coastal sharks in this area. However, NMFS maintains that the benefits of rebuilding large coastal sharks and preventing overfishing of pelagic sharks will have positive impacts in the long term.

9.4 New Jersey Community Profiles

Demographic Profile of New Jersey (Source: U.S. Bureau of the Census, 1990)

Population: 7,730,188

Education: nearly 77 percent of residents 25 and older graduated from high school

Employment: 5.7 percent of the civilian labor force is unemployed. The retail sector employs 15 percent of the working residents. Manufacturing (durable goods - eight percent; nondurable - nine percent), and construction (six percent) are other major sources of employment. Forestry, agriculture, and fisheries account for approximately one percent of industry in New Jersey.

Per capita income (1989): $18,714

Characteristics of Fisheries in New Jersey

In 1996, commercial bluefin tuna landings in New Jersey totaled approximately 7.7 mt, accounting for less than one percent of the total commercial bluefin tuna landings in the Atlantic and Gulf states. The majority of these fish are landed by longliners incidental to other fishing operations. The ex-vessel gross revenues of these landings were approximately $67,000, representing less than one percent of the total for commercial bluefin tuna landings in the Atlantic and Gulf states (NMFS). Swordfish landings totaled approximately 110 mt, accounting for nearly five percent of the total swordfish landings in the Atlantic and Gulf states. The ex-vessel gross revenues of these landings were approximately $800,000, representing five percent of the total for

swordfish landings in the Atlantic and Gulf states (NMFS). Shark landings totaled approximately 260 mt, with ex-vessel gross revenues of approximately $394,000 (NMFS). In the New Jersey recreational fishery, expenditures by saltwater anglers were approximately $747 million, nearly nine percent of the total U.S. expenditures by saltwater anglers although it is unknown what percentage of these expenditures were for HMS fisheries. Saltwater fishing for all species in New Jersey incurred expenditures of nearly $1.5 billion
(5.9 percent of the U.S. total), generated wages and salaries of approximately $415 million and created 16,112 jobs (ASA, 1997).

Communities in New Jersey that are likely to be affected by the HMS FMP include fisheries in the following towns: Barnegat Light, Beach Haven, Brick, Brielle, Cape May, Forked River, Manasquan, Point Pleasant, and Sea Isle City (Table 9.5). The researchers chose to focus on Barnegat Light and Brielle, New Jersey. Barnegat Light has the largest bluefin tuna, swordfish, and large coastal shark landings in the state. Brielle also has a sizeable number of permits and landings of bluefin tuna and large coastal sharks (Table 9.6).

Table 9.5 Demographic characteristics of New Jersey communities affected by the HMS FMP. (U.S. Bureau of the Census, 1990)

Community	1990 Census Population	Sex Ratio M/F	% of Married Family Households	% of High School Graduates Age 25 and over	Civilian Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry and Fisheries Industry
Barnegat Light	681	1.08	50.3	84.9	1.0	$25,973	12.6
Beach Haven	1,475	0.94	52.1	84.2	6.5	$18,527	0.9
Brick	66,473	0.91	63.9	79.8	5.6	$16,523	1.3
Brielle	4,406	0.93	60.3	91.3	6.9	$24,027	1.6
Manasquan	5,369	0.96	52.5	88.2	2.7	$19,409	0.5
Point Pleasant	18,177	0.90	59.1	81.1	4.5	$18,770	1.5
Cape May	4,668	1.18	50.4	84.4	6.4	$15,884	1.6
Forked River	4,243	0.97	63.5	76.7	4.4	$14,875	1.4
Sea Isle City	2,692	0.93	54.6	78.9	8.4	$17,768	0.0

Table 9.6 Fishery characteristics of New Jersey communities affected by the HMS FMP. (NMFS, 1997)

Community	**Bluefin Tuna Landings** ***dressed wt in metric tons (mt)***	**Bluefin Tuna Landings** ***rank by weight***	**Commercial Tuna Permits** ***number***	**Commercial Tuna Permits** ***rank***	**Recreational Tuna Permits** ***number***	**Recreational Tuna Permits** ***rank***	**Swordfish Landings** ***# of fish***	**Swordfish Landings** ***rank***	**LC Shark Landings** ***# of fish***	**LC Shark Landings** ***rank***
Barnegat Light	5.0	1	76	5	26		12,899	1	515	1
Beach Haven			30	8	57	4				
Brick			29	9	55	5				
Brielle			91	3	41	10	69	5	35	3
Manasquan			82	4	76	3				
Point Pleasant	0.6	3	175	1	143	2	2,105	2	13	5
Cape May	0.3	4	115	2	228	1	90	4	8	6
Forked River			19		42	9	31	7	18	4
Sea Isle City	1.1	2	14		22		703	3	162	2

9.4.1 Barnegat Light

Barnegat Light is one of eleven municipalities on Long Beach Island, a large "barrier beach" island that helps form the seaward boundary of Barnegat Bay. This small town measures less than one square mile and is located on the northern end of the barrier island. The town is named after its famous lighthouse that guided ships for generations along the New Jersey coast. The name Barnegat originates from "Barende-gat," a Dutch name meaning "inlet of breakers" (Beck, 1963). In 1995, the infamous inlet's fierce currents were tamed by a $45 million Army Corps of Engineers project that constructed a south jetty along with a three-quarter-mile beach and a fishing pier (Beacon, 1994). Commercial and recreational fishing have a long tradition here. At a recent public hearing held by NMFS, the mayor of Barnegat Light attested to the importance of recreational and commercial fishing in this area.

Throughout the interviews with Wilson *et al*., citizens from Barnegat Light emphasized the significant role that the fishing industry, especially the pelagic longline fishery and the scallop fishery, has in sustaining their community (Wilson *et al*., 1998). Barnegat Light's small businesses rely on the summer tourist economy and the year-round fishing industry. According to local citizens, commercial fishing employs as many as 150 local people at marinas. The marinas are the major source of tax revenue for the community, according to representatives of the community's taxpayers association. In addition, small businesses are able to stay open all year because of the fishing industry, and this has stabilized the community so that it has the lowest crime rate on Long Beach Island.

The fishing industry is an integral part of the social and economic livelihood of Barnegat Light, one of Ocean County's most important ports. Of the 1993 Ocean County landings totaling 28.5 mt, the port totaled 3.8 mt but the ex-vessel gross revenues from these landings were $9.1 million, which represents 39 percent of the dollars associated with Ocean County landings (New Jersey Department of Agriculture, 1995). Although Barnegat Light is mainly a fishing community of pelagic longliners, there is also a small group of coastal gillnetters plus seven large sea scallopers (NJ FishNet, 1997).

There are five marinas in Barnegat Light. The two largest docks have 36 full-time resident commercial vessels, approximately 40 recreational and charterboats, and some transient vessels. Commercial fishing vessels work out of these docks year round. The three remaining docks can each accommodate approximately 30 to 35 vessels, most of which are recreational vessels and charterboats/partyboats, with a few headboats. Most of the recreational and sportfishing fishing vessels that utilize this port are in Barnegat Light for part of the year, usually from May or June through early October. And like all ports in the region, it has a significant recreational fishery, with an equally long tradition. The longliner fleet is side by side with the partyboats at one of the docks.

One dock is completely occupied by privately-owned, commercial vessels, including seven scallopers, ten longliners that fish for tunas, swordfish, and tilefish, and about nine inshore net vessels. Three offloading stations are part of this dock. Five or six locally hired full-time employees, the vessel captain, and the crew perform the offloading. Additional

dock hands are hired locally for the busy season. The owners of the dock sell some of the catch to fresh fish markets in Boston, Philadelphia, Maryland, and New York with the remaining being sold to local restaurants, retailers, wholesalers or at their own fish market, which is open from April to October (McCay, 1993).

Demographic Profile of Barnegat Light (Source: U.S. Bureau of the Census, 1990)

Population: 681; male to female ratio is 1.8 to 1.

Racial and Ethnic Composition: 99.6 percent Caucasian; 0.4 percent African-American. The dominant cases of single ancestry are primarily European: German (12.2 percent), Irish (4.7 percent), English (3.8 percent), Italian (3.1 percent), and Polish (2.8 percent).

Age Structure: 33 percent aged 15 to 44; 57 percent above age 44; ten percent under age 15.

Marital Status: 60 percent married; 19 percent never-married; 11 percent divorced; and nine percent widowed. Of those widowed, 72 percent are female and 28 percent are male.

Housing Composition: 342 households; average of 1.99 persons per household.

Education Trends: Of people 25 years and older, 84.9 percent are high school graduates.

Per Capita Income: $25,973; this is comparable to the per capita income of Brielle ($24,027), but is considerably higher than the per capita income for the state ($18,714).

Employment: Of residents 16 years and older, 51 percent participate in the civilian labor force. The unemployment rate for Barnegat Light is only one percent of the civilian labor force; this is considerably lower than the state unemployment rate (5.7 percent). Of occupations reported in the 1990 Census, 32 percent are managerial/professional, 31 percent are technical/administrative, 14 percent involve precision production, craft and repair, and over ten percent are farming, forestry, and fishing related.

Fishing Organizations: Some of the fisheries organizations include: Blue Water Fishermen's Association; Forked River Tuna Club; Jersey Devils Fishing Club; Beach Haven Marlin and Tuna Club; Long Beach Island Fishing Club; and United National Fishermen's Association.

The Mid-Atlantic Pelagic Longline Fishery

The Barnegat Light port is known for its pelagic longline fishery. Today the fleet targets yellowfin and bigeye tunas for most of the year and swordfish for part of the year. Pelagic and large coastal sharks are important incidental catches and some species like mako, porbeagle, and sandbar sharks are usually kept and sold. The split season for large coastal sharks impacts this fishery because large coastal sharks are less abundant in the mid-Atlantic during the winter season and the fishery is usually closed by the time the sharks are abundant

in the area. A few vessels continue to bottom longline for tilefish in the deep waters of the outer continental shelf and canyons. Some captains from this port have begun to fish off the coasts of other countries. Pelagic longline crews are increasingly from other regions, such as Nova Scotia and some of the southern states. Some of the pelagic longline fishermen from Barnegat Light have become distant-water operators, going to the Grand Banks off Newfoundland, the waters off Greenland, as well as the Caribbean, Brazil, and other distant fishing grounds. The owner of one major fleet (six longline vessels) has left Barnegat Light to fish for HMS in the Pacific Ocean.

Other captains of pelagic longline vessels strongly prefer to work closer to home or to take shorter trips. The options of those who resist going to other ports are far more restricted. Distant water fishing is very disruptive to families and the community. Some local vessels are now converting from pelagic longline fishing to monkfishing, although many who have tried to convert to other fisheries have failed to meet deadlines for limited entry. Another concern of local residents is that the demise of commercial fisheries is likely to transform the use of the waterfront, bringing in condominium development where marinas are now located, an outcome which many long-term residents find undesirable.

The recession in Japan has had immediate and serious repercussions for the longline fishery, severely depressing export markets for high quality tunas and other export species. Foreign suppliers of tunas and swordfish are filling the U.S. market niche for additional swordfish and tunas. A local importer said that the share of overseas fish in the domestic market for swordfish and tunas has gone from ten percent to 90 percent in just a few years.

Fishermen in the pelagic longline fleet defend their practices with regard to bycatch. This gear is often criticized for being “non-selective” and a major source of mortality for bluefin tuna, marlins, undersized swordfish, and other species. However, the captains note that when they are out there fishing for two or three weeks at a time, they have a strong economic incentive to focus on the best opportunities for “clean” catches. If they have high bycatch in one area, they move to another area. Some longliners feel that individual bycatch quotas for swordfish and sharks should be implemented and that a government observer should be placed aboard each vessel. Many believe that all catch should be retained, citing other government programs which allow the sale of dead bycatch with proceeds used to fund research (Wilson *et al*., 1998).

Community Impacts in Barnegat Light, New Jersey

The pelagic longline fleet is under considerable strain due to increasingly stringent regulations, market difficulties, and problems in securing and retaining trained crew members. Numerous vessels are operating on very thin profit margins. Measures that further restrict this fishery, through large quota reductions or closures, will affect more than just the marginal vessels. However, NMFS maintains that the final actions are necessary to meet the conservation requirements of the Magnuson-Stevens Act. These measures provide for sustained participation in the fishing communities of Barnegat Light, within the constraints of the resource, while minimizing economic impacts to the extent practicable.

This FMP establishes the foundation to develop an international rebuilding plan for Atlantic bigeye tuna. SCRS has strongly recommended that Atlantic-wide landings be reduced to 1992 levels. This would involve at least a six-percent reduction in Atlantic-wide landings from 1997 levels. The United States would implement the international rebuilding program through domestic measures including quotas, increased minimum sizes and/or retention limits as appropriate. A six-percent reduction in commercial landings would mean a similar reduction in revenues. Since bigeye tuna are not often a recreational target, except in specific areas at certain times of the year, and since many trips targeting bigeye tuna may also target and land yellowfin tuna and vice versa, it is difficult to say how a reduction in bigeye tuna landings would affect angler consumer surplus. It would most likely go down, but the extent to which it would go down is unknown. The pelagic longline fishery of Barnegat Light could be affected by the rebuilding plan, although the extent of the community impacts cannot be assessed at this time since ICCAT has not yet adopted a rebuilding program for bigeye tuna.

Accounting for dead discards in swordfish management could result in an estimated 13-percent decrease in total revenues in the swordfish fishery, beginning in 2000. This estimate is based on the weight of 1997 dead discards relative to 1997 total mortality in the U.S. north Atlantic swordfish fishery. This measure may also affect the timing of closures of the directed fishery. If ICCAT adopts a ten-year rebuilding program for swordfish, it could result in a 27-percent decrease in TAC for the United States; large negative impacts to revenues would be associated with this action. Some vessels that rely heavily on swordfish revenues will be forced to shift some effort to other fisheries or exit fishing altogether. Displaced effort would likely vary by the individual vessel; some members of the pelagic longline community in Barnegat Light may shift effort to longlining for dolphin, wahoo, and BAYS; or to the mackerel, squid and butterfish trawl fishery.

The final action closing an area to pelagic longlining off the mid-Atlantic coast from 39 to 40° N and 68 to 74° W during June will likely affect the longline fleet based in Barnegat Light, although it is not expected to have a significant impact on landings of target species such as sharks, swordfish, and tunas other than bluefin. If fishermen decide to displace effort to other areas, fishing costs for fuel, bait, and ice may increase. In addition, travel time to the fishing grounds may increase. However, because the area is only closed during the month of June, this possible increase in fishing costs should not be significant. This time/area closure may also have an impact on entities such as seafood processors and other related businesses in the area. While fishing effort will be displaced to other locations, this action, given its short time-span, will not likely have adverse impacts on these communities.

There are also potential concerns regarding safety-at-sea associated with this time/area closure. NMFS received comments that the four by four degree closed area as initially proposed would force vessels to travel through, and fish in, a dangerous area of the Gulf Stream. This was a particular concern for some of the smaller vessels which would have to travel farther despite their limited fuel capacity. The modification of the closed area to the selected one by six degree area should mitigate some of these concerns especially since the selected area does not include the dangerous area that was noted by most commenters.

The limitation on length of the mainline may affect a few pelagic longline vessels, but no social impacts to the Barnegat Light community are expected. The requirement to have VMS onboard every pelagic longline vessel fishing for HMS will involve a substantial one-time cost ($1800 for unit plus $100 for installation) for the community in Barnegat Light, but this measure is necessary to implement time/area closures effectively. Together, the measures in the swordfish rebuilding plan, the time/area closure and the VMS requirement are likely to have some social impacts on the pelagic longline community of Barnegat Light. However, NMFS maintains that these costs will be offset by the benefits of long-term stability for the community when the conservation goals of this FMP are met.

The limited access program may have minor social impacts on the mid Atlantic pelagic longline fishery in Barnegat Light; however, this system removes latent effort only and issues directed and incidental permits based on historical and current fishery participation in the swordfish and shark fisheries. Directed permits will allow fishermen to operate under the quotas, seasons, and commercial retention limits established under this FMP. The retention limits for incidental permit holders should allow fishermen to continue to land fish in quantities similar to current levels. Transferability of permits also provides fishermen with additional flexibility in business planning. Although there are a few cases where fishermen may have allowed their permits to lapse, thus potentially excluding them from the limited access program, the limited access proposal was generally well received in the pelagic longline fishing community of Barnegat Light.

Expanding the list of prohibited shark species to include dusky sharks may have some social impacts for the mid Atlantic pelagic longline fishery by essentially establishing a catch and release fishery for this marketable species. The other species included in the prohibited species management unit are unlikely to have any social impacts in Barnegat Light because most fishermen do not land these species. Additionally, the final decision not to add blue sharks to the prohibited species management unit should minimize social impacts.

Commercial shark regulations that may impact Barnegat Light include establishing a minimum size on ridgeback large coastal sharks (LCS), reducing the non-ridgeback LCS quota, counting dead discards and state landings after Federal fishery closures against Federal quotas, announcing fishery seasons ahead of time, establishing a separate quota for blue sharks, and establishing a separate species-specific quota for porbeagle sharks. Establishing a minimum size on ridgeback LCS and reducing the non-ridgeback LCS quota may have only moderate social impacts because the mid Atlantic pelagic longline fishery tends to fish where most ridgeback LCS are larger than the minimum size and does not land large quantities of non-ridgeback LCS. Counting dead discards and state landings after Federal fishery closures against Federal quotas may also have social impacts on this community because both the ridgeback and non-ridgeback LCS quotas may be reduced significantly, which would reduce revenues from incidental catches of these species. Announcing fishery seasons ahead of time should increase the stability and predictability of shark fisheries, particularly LCS fisheries, and should have positive impacts in northern communities such as Barnegat Light. Prior to implementation of this FMP, the quota for the second half of the fishing year (the season in which northern area fishermen primarily fish) was reduced to account for any overharvests in the first half of the fishing season.

The social impacts of establishing a blue shark quota for the mid-Atlantic pelagic longline fishery in Barnegat Light are expected to be minor because the majority of blue sharks caught in the pelagic longline fishery are released alive and the final action to reduce the pelagic shark quota by overages in the blue shark quota should create an incentive to maximize blue shark survival. The separate porbeagle shark quota should have negligible social impacts because the selected quota is ten percent higher than recent landings and is intended to prevent fishery expansion from current levels. Cumulatively, the final actions on shark fisheries are likely to have some social impacts on the pelagic longline community of Barnegat Light. However, NMFS maintains that the impacts have been minimized to the extent practicable while still meeting conservation goals and Magnuson-Stevens Act requirements.

9.4.2 Brielle/Point Pleasant

Brielle is located in the southernmost region of Monmouth County, and borders the Manasquan River of central New Jersey. Brielle participants agreed that the relevant unit is the port of Manasquan, including the municipalities of Brielle, Point Pleasant Beach, Point Pleasant, and Manasquan, all centering on the Manasquan River and Manasquan Inlet. For the purposes of this document, the community will include Brielle/Point Pleasant. This is an area where recreational fishermen are as traditional as commercial fishermen, and recreational fishermen are distressed about the management of tunas and sharks.

The Brielle/Point Pleasant port is one of the most important of the inlet ports along the barrier beach complex that makes up the New Jersey coast. It has been a center of both recreational and commercial fishing since the early 1800s. It is estimated that up to 100 working charterboats used this port historically. Today, Brielle has 21 charter/ headboats, 14 of which are active fulltime. There are 64 charter/headboats in Point Pleasant. The majority of vessels that fish offshore are private vessels. It is reported that although these vessels actively fish for tunas and are thus required to have an Atlantic tunas permit, many of these vessels do not hold the necessary permit.

Demographic Profile of Brielle/Point Pleasant (Source: U.S. Bureau of the Census, 1990)

Population: 4,406; approximately 50 percent male and 50 percent female. The population in 2005 is projected to be 4,634.

Racial and Ethnic Composition: 93.7 percent Caucasian, 5.5 percent African-American, less than one percent American Indian. The dominant cases of single ancestry in Brielle are European: Irish (10.1) percent, German (6.9 percent), and English (5.5 percent).

Age Structure: 36 percent aged 15 to 44; nearly 50 percent over age 44; 16 percent under age 15.

Marital Status: Nearly 60 percent married; 22 percent never-married; ten percent divorced; eight percent widowed. Of those widowed, 87 percent are female and 13 percent are male.

Household Composition: 1,735 households; average of 2.54 persons per household.

Education Trends: Of people 25 years and older, 91 percent are high school graduates.

Per Capita Income: $24,027; this is similar to that of Barnegat Light ($25,973), but is considerably higher than the state per capita income of $18,714.

Employment: Of residents 16 years and older, 63 percent participate in the civilian labor force. The unemployment rate for Brielle is 6.9 percent, slightly higher than the state unemployment rate (5.7 percent). Of the employed population, approximately 73 percent work in private, for-profit companies, 8.5 percent work for local government, and 8.4 percent are self-employed. Of occupations reported in the 1990 Census, 44.7 percent are managerial/professional, 31.5 percent are technical/administrative, and less than one percent are farming, forestry, and fishing related.

Fishing Organizations: These fisheries organizations include: Recreational Fishing Alliance; Atlantic County Party and Charter Boat Association; Bergen County Saltwater Anglers; Fishermen's Dock Cooperative; Greater Point Pleasant Charter Boat Association; Holiday City Fishing Club; Indian River Charter Boat Association; Jersey Coast Anglers Association; Jersey Coast Shark Anglers; Manasquan Fishing Club; Manasquan River Tuna and Marlin; Northeast Mako Owners Club; Sandy Hook Bay Anglers; Seaside Fishing Club; Shark River Beach and Yacht Club; and Silverton Fishing Club.

The Rod and Reel Tuna Fishery

Brielle recreational fishermen (private and charter/headboats) have historically targeted school bluefin tuna. This has been, until recent HMS regulations, an important fishery for the charter/headboat industry as well as private vessel industry operating from Brielle and other New Jersey ports. Respondents indicate that New Jersey has had a recreational school bluefin tuna fishery long before longliners, purse seiners and commercial rod and reel vessels developed their fisheries (Wilson *et al*., 1998). There is documentation back to the 1890s regarding the recreational fishery for bluefin tuna. According to respondents, New Jersey vessels landed nearly 20,000 bluefin tuna in one month of 1939. The 1998 annual coastwide Angling category quota was 269 mt, or about 19,000 fish. School bluefin tuna (measuring 27 inches to less than 47 inches) are especially important to New Jersey fishermen.

Today the offshore recreational fishery primarily targets yellowfin tuna. People in the industry are concerned about the prospects for yellowfin recreational retention limits or quotas, and are concerned that NMFS data underestimate actual catches, in contrast with state data. Respondents say that recorded catches of yellowfin from four states exceed the NMFS coastwide estimate. There is concern that fishermen may someday have to fish under a quota based on an incomplete landings history. Currently there are no quotas although this FMP does implement a recreational retention limit of three yellowfin tuna per person per day.

Here, as elsewhere in New York and New Jersey, HMS fisheries often take place in the "canyons" and around eddies and at the edge of the continental shelf. In the past, bluefin

tuna could be caught on day trips in coastal waters, rather than the canyons, and they were the major source of profit for the charter/headboat fleet here (and elsewhere in New Jersey and the larger Mid-Atlantic). Today, the canyon fisheries for tunas are thought of as additional opportunities for most charter/headboat captains, who regularly take clients fishing for bluefish, fluke, or other tunas.

At one time, the full-time canyon fishermen included hundreds of inshore bluefin tuna vessels, and "six-pack" boats (smaller vessels certified to carry no more than six passengers; also known as uninspected vessels). Respondents indicate that they must steam 80 miles offshore to reach the canyons, and are therefore limited by weather. A similar trend is found in Cape May, New Jersey, where anglers fish in the Baltimore Canyon. The Hudson Canyon offshore fishery, of the Brielle/Point Pleasant fleet, started 15 to 20 years ago, and they rely heavily on it for the fall fishery. This fishery has diminished, and the smaller, less powerful vessels are gone. Recent improvements in the U.S. economy have once again fueled investment in expensive offshore fishing vessels, and this is a major contribution to New Jersey's economy. For example, the majority of the private vessels purchased in the Cape May area are built in New Jersey. There are eight tackle shops in the Brielle/Point Pleasant area. Some are heavily dependent on HMS fishing, and thus these industries are particularly concerned about the uncertainty regarding the potential to land bluefin tuna.

Charter/headboat captains indicate that in 1998, they were generally unable to book tuna trips, because passengers do not like to take trips when the bluefin tuna retention limit is low or when retention is prohibited. One of the charterboat owners said that in 1991, the four busiest captains averaged 30 to 35 tuna trips each, but that the average number trips dropped approximately 12 in 1996 (Wilson *et al*., 1998). The argument for more liberal retention limits includes the idea that it is necessary to keep people interested in the gambling aspect of the fishery. Although people may not actually land more fish, customers are attracted by the possibility. Charterboat captains emphasize that reasonable recreational retention limits are important to their clients, who wish to bring fish home to eat and share with others.

Due to landings restrictions on bluefin tuna, bluefish has generally replaced the tunas as the important inshore/offshore fishery in northern New Jersey. The Brielle/Point Pleasant charter/headboat fishermen, like most other people involved in the sport fisheries, would like to see the economic value of their fisheries documented. In this light, a recent study done in Virginia found that 30 percent of the fisheries income in the state came from the offshore recreational fisheries. Respondents emphasized that the figure is likely to be much larger for New Jersey (Wilson *et al*., 1998).

Adding to the general problems of the bluefin tuna fishery in New Jersey is the effect of the "north-south line." This line (38° 47' N), roughly at Delaware Bay, is used to separate the Angling category fishery into a northern and a southern area. Recreational bluefin tuna fishermen from Brielle fish in the northern area whereas fishermen from Cape May and other southern ports have historically fished in the southern area. However, because it is unlawful to possess bluefin tuna in excess of the daily retention limit in the respective area, those who fish in the southern zone and return to a New Jersey port with their catch must abide by northern area regulations.

Recreational fishermen in New Jersey feel that regulations favor commercial fishermen. Others feel that even within the commercial fisheries there is discrimination against the small businessmen. There is concern that recreational fishing communities are not adequately recognized in the Magnuson-Stevens Act and that if NMFS does not consider recreational fishing history, New Jersey fishermen will be disadvantaged. Those interviewed feel that an increase in the minimum size of bluefin tuna would make the booking of charters more difficult and hurt tackle and bait sales (Wilson *et al.*, 1998). They also noted that charter/headboat businesses need to know as far ahead of time as possible when the fishery will be open in their geographic area.

The Recreational Shark Fishery

Sharks are comparatively less important to recreational fishermen in Brielle than bluefin tuna. Sharks play an important role in the fishing industry, and, while other fish may be available, some customers are attracted by shark in particular. Makos are the sharks with the greatest economic importance to the recreational fishery in New Jersey. Respondents are concerned that there has been a decline in population and that makos need protection. Mako tournaments are popular and several impose catch restrictions on participants. They have recently canceled some traditional shark tournaments out of concern for the stock, and two recent shark tournaments in New Jersey did not catch a single mako above the tournament's minimum size. Researchers reported that the shark fishery in Brielle is being strongly affected by a decrease in its historical tuna fishery and is therefore more vulnerable to negative impacts.

Community Impacts in Brielle/Point Pleasant, New Jersey

The final actions in this FMP provide for sustained participation in the fishing communities of Brielle/Point Pleasant, while minimizing economic impacts to the extent practicable. The ICCAT Rebuilding Program for bluefin tuna is unlikely to have any social impacts on the rod and reel tuna fishery in Brielle, since the TAC will not change substantially and this FMP maintains status quo allocation patterns. In fact, given the minor increase in the landings quota, the Angling category could generate a slight increase in angler consumer surplus. The recreational bluefin tuna fishery is managed and regulated under a strict quota, and retention limits help ensure that the fishery is kept within the quota. In order to maximize fishing opportunities for all fishermen in the Angling category, NMFS has the authority to open and close the recreational fishery at any time during the year, in any area. This FMP also establishes a recreational retention limit of three yellowfin tuna per person per day. This measure is not likely to have a major social impact on the recreational fishery because LPS data indicate that although 79 percent of trips have three or more anglers on board, only five percent of trips land more than nine yellowfin tuna. Based on an average size of 33 pounds, this measure will allow approximately 99 pounds of yellowfin tuna per person per trip. NMFS concludes that this is an adequate amount for consumptive use by recreational and charter/headboat anglers.

The requirement for all charter/headboat vessels fishing for HMS to obtain a permit and submit logbooks will have an economic impact on those fishermen who do not already have a

Charter/Headboat permit for tunas. The owner will be charged a fee for the vessel permit (probably $20 to $40) to cover administrative costs. The charter/headboat captain will have to take the time to fill out the logbook. However, many captains who already keep logbooks on a voluntary basis commented that faxing or mailing their report to NMFS is a small burden that is well worth the benefits of supporting more effective HMS management. Also, many captains already complete the Northeast Multispecies Logbook and thus would be exempt. Mandatory tournament registration for all HMS will impose a reporting burden on tournaments that target only tunas and sharks, but tournaments that also target billfish and are already subject to reporting requirements will not be affected by this measure. Overall, these measures may have some impacts, but are not likely to have major social impacts on the Brielle rod and reel tuna fishery.

Expanding the list of prohibited shark species to include dusky sharks is likely to have some social impacts for the recreational shark fishery in Brielle by essentially establishing a catch and release fishery for this trophy species. The other species included in the prohibited species management unit are unlikely to have any social impacts on this community because most recreational fishermen do not harvest these species. Additionally, the final decision not to add blue sharks to the prohibited species management unit should minimize social impacts.

Establishing a minimum size of 4.5 feet in the recreational shark fishery is likely to have some social impacts to the community in Brielle. However, since New Jersey has already implemented a minimum size of four feet, the impact will not be as pronounced as in other communities which currently have no state restrictions on the recreational shark fishery. This action essentially establishes a catch and release fishery for sharks in near-shore waters because many sharks harvested in this fishery are smaller than this minimum size. Social impacts for offshore anglers will be minor because most sharks harvested offshore are larger than this minimum size.

Reducing the recreational retention limit for sharks may have some social impacts on charterboat and tournament operations that prefer to retain their shark catches; however, researchers have noted an increasing catch-and-release ethic among anglers which may mitigate any negative social impacts. The 1998 Shark Evaluation Workshop analyses suggest that most sharks are released and that 63 percent of all shark recreational trips will be unaffected by a recreational retention limit of one shark per trip. The final action to establish an additional allowance of one Atlantic sharpnose shark per person per trip should minimize social impacts. Additionally, anglers may be willing to pay more for the opportunity to catch larger sharks once the stocks rebuild, bringing positive social impacts to the recreational shark fishing community of Brielle in the long term. Overall, the final actions under the shark rebuilding program are likely to have some social impacts. NMFS maintains, however, that these measures are necessary to rebuild large coastal sharks and prevent overfishing of pelagics and small coastal sharks, and that the final actions minimize social impacts while allowing for limited harvest of sharks.

9.5 North Carolina Community Profiles

Demographic Profile of North Carolina (Source: U.S. Bureau of the Census, 1990)

Population: 6,628,637

Education: 70 percent of residents 25 years and older graduated high school

Employment: 4.8 percent of the civilian labor force is unemployed. Retail and manufacturing are major industries in North Carolina. Agriculture, forestry, and fisheries account for approximately three percent of employment.

Per capita income (1989): $12,885

Characteristics of Fisheries in North Carolina

In 1996, bluefin tuna landings in North Carolina totaled nearly 16.8 mt, accounting for less than one percent of the total bluefin tuna landings in the Atlantic and Gulf states. The ex-vessel gross revenues of these landings totaled approximately $100,000, representing less than one percent of the total for the Atlantic and Gulf states (NMFS). Swordfish landings totaled approximately 79.8 mt, accounting for nearly four percent of the total swordfish landings in the Atlantic and Gulf states. The ex-vessel gross revenues of these landings was approximately $438,000, nearly three percent of the total for the Atlantic and Gulf states (NMFS). Shark landings totaled approximately 828 mt, with ex-vessel gross revenues of approximately $754,000 (NMFS).

In the recreational fisheries, expenditures by saltwater anglers in North Carolina were approximately $673 million, accounting for nearly eight percent of the total U.S. expenditures by saltwater anglers. Saltwater fishing in North Carolina incurred expenditures of nearly $1.3 billion (about five percent of the U.S. total), generated wages and salaries of approximately $357 million and created over 19,000 jobs (ASA, 1997).

Communities in North Carolina that are likely to be affected by the HMS FMP include fisheries in the following towns: Atlantic Beach, Beaufort, Harkers Island, Hatteras, Manns Harbor, Manteo, Morehead City, Nags Head, Oregon Inlet, Swansboro, Wanchese, Wilmington, and Wrightsville Beach (Table 9.7). This study focuses on the potential effects of the HMS FMP in Hatteras and Wanchese as representative of North Carolina fishing communities. Wanchese has the highest bluefin tuna, swordfish, and large coastal shark landings in North Carolina. Hatteras has an important bluefin tuna recreational fishery and notable large coastal shark landings (Table 9.8).

Table 9.7 Demographic characteristics of North Carolina communities affected by the HMS FMP (U.S. Bureau of the Census, 1990)

Community	1990 Census Population	Sex Ratio M/F	% of Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry and Fisheries Industry
Atlantic Beach	1,938	1.14	48.6	85.1	3.1	$19,373	2.9
Beaufort	3,808	0.81	44.3	75.1	8.1	$11,385	3.0
Harkers Island	1,761	1.01	73.4		2.4	$9,505	8.2
Morehead City	6,046	0.83	40.3	70.6	6.4	$11,410	3.0
Hatteras	2,675	1.07	59.1	74.4	4.2	$12,796	6.4
Manns Harbor*							
Manteo	991	0.94	44.3	76.1	4.0	$13,068	3.8
Nags Head	1,838	1.01	53.7	83.5	3.3	$17,295	2.4
Oregon Inlet*							
Wanchese	1,374	1.05	62.6	67.3	10.0	$10,830	19.7
Swansboro	1,165	0.86	52.6	90.1	5.6	$12,919	1.8
Wilmington	55,530	0.82	38.6	73.1	6.3	$12,077	1.0
Wrightsville Beach	2,937	0.99	40.3	95.6	3.0	$29,722	1.6

Table 9.8 Fisheries characteristics of North Carolina communities affected by the HMS FMP. (NMFS, 1997)

Community	Bluefin Tuna Landings *dressed weight in metric tons (mt)*	Bluefin Tuna Landings *rank by weight*	Commercial Tuna Permits *number*	Commercial Tuna Permits *rank*	Recreational Tuna Permits *number*	Recreational Tuna Permits *rank*	Swordfish Landings *# of fish*	Swordfish Landings *rank*	LC Shark Landings *# of fish*	LC Shark Landings *rank*
Atlantic Beach			69	3	167	2				
Beaufort	1.6	2	24		64	8	1	7	19	7
Harkers Island	0.2	5	28	9	67	7				
Morehead City	0.2	3	82	2	368	1	1	7	19	7
Hatteras	429	4	83	1	71	6			135	3
Manns Harbor			5		1		34	3	54	5
Manteo			29	8	32		236	2	555	2
Nags Head			6		19				100	4
Oregon Inlet			23		15		13	5	45	6
Wanchese	2.8	1	39	4	8		674	1	612	1
Swansboro			24		75	5				
Wilmington			32	6	111	3				
Wrightsville Beach			36	5	84	4	33	4		

9.5.1 Hatteras

Hatteras Village is a rural community at the southern end of Hatteras Island on North Carolina's Outer Banks. Hatteras Island is a dynamic barrier island, bordered by the Atlantic on the east and Pamlico Sound on the west. In the 18th century, Hatteras established itself as a seaport community, where activities included whaling and exporting/importing. Since World War II, the economy of the Hatteras community has depended on charter and commercial fishing. There are five seafood wholesalers, one retail market, and three marinas (Wilson *et al.*, 1998). Businesses in surrounding communities such as Manteo and Buxton also add to the marine economy. Commercial fishing is a major occupation on Hatteras Island, where there are approximately 500 to 600 part-time and full-time commercial fishermen (Wilson *et al.*, 1998).

Tourism and recreational fishing are also major industries in Hatteras in terms of seasonal employment (CNCSS, 1993). There are three economic "seasons" in Hatteras (CNCSS, 1993). In the spring, weekend and holiday travelers cause an increase in revenue; approximately 30 vessels from the commercial fleet become active in charter fishing beginning in April. During the second season, June through August, family vacations provide tourist income. The third season is the fall, when fishing, surfing and windsurfing are the dominant activities. Over the past several years (except for 1998) a strong but brief winter fishery has emerged for bluefin tuna. The brevity of the season (two to three weeks) and its recent nature has meant the fishery has not yet established itself as an integral part of the economy (Ditton *et al.*, 1998).

Demographic Profile of Hatteras (Source: U.S. Bureau of the Census, 1990)

Population: 2,675 in Hatteras Township, consisting of Avon, Buxton, Frisco and Hatteras; 52 percent male, 48 percent female.

Racial and Ethnic Composition: 99 percent Caucasian; less than one percent each of African-American and American Indian races. The ancestry of the community is of predominantly European descent.

Age Structure: 45 percent aged 15 to 44; 19 percent under age 15; 36 percent above age 44.

Marital Status: 66 percent married; 21 percent never-married, seven percent are divorced; and six percent widowed. Of those widowed, 86 percent are female and 14 percent are male. Of those divorced, 75 percent are male and 25 percent are female.

Household Composition: 1,078 households; average of 2.38 persons per household.

Educational Trends: 74.4 percent of the population 25 and older graduated from high school.

Per Capita Income: $12,796; state average is $12,885. Compared to the community at large, only a few commercial fishermen have had considerable financial success; business owners in the fishing industry, such as marina and restaurant owners, have been relatively financially successful (CNCSS, 1993).

Employment: Unemployment rate is 4.2 percent of the labor force. In the civilian employed population, 58 percent are men and 42 percent are women. Thirty percent of the population over 16 do not participate in the labor force. Managerial, professional, technician, and administrative jobs account for nearly half of the occupations, retail trade accounts 26 percent, agriculture, forestry, and fisheries jobs are held by six percent of those employed in Hatteras.

Fishing Organizations: One of the most prominent fishing organizations is the Hatteras-Ocracoke Auxiliary of the North Carolina Fishermen's Association.

The Recreational HMS Fishery

The recreational rod and reel fishery for pelagic fish flourishes in Hatteras. A bluefin tuna fishery during winter months is intense but somewhat unpredictable. Early in the spring, fishermen target offshore yellowfin tuna, dolphin, and wahoo, followed by marlin and sailfish fishing in the summer. Other species caught seasonally include king mackerel and striped bass. Fly fishing has become more popular, although it still comprises a small number of offshore trips from Hatteras. In a survey of both private vessel and charterboat anglers in Hatteras during the winter of 1997, researchers found that of 644 anglers, 46 percent agreed with the statement "I caught more fish than I expected on this trip" and 42 percent agreed that they "could not imagine a better fishing trip" (Ditton *et al*., 1998). Captains say it is very hard to find a year-round mate because college students work summers only and most skilled fishermen want their own vessels (Wilson *et al*., 1998).

About half of fishing parties are all male and the other half are families, some of which participate in other tourist activities while the others fish. "Make-up charters", where marinas organize the parties, are becoming increasingly common (Wilson *et al*., 1998). One captain estimated that his marina did 140 make-up charters in the past year. The majority of the charter customers want to fish offshore. Customers are often willing to accept retention limits imposed by the captain, although the possibility of landing at least one fish is important to many anglers.

Changes in fishing conditions including weather conditions and the availability of fish affect charter bookings almost instantly, and there is not much customer loyalty to Hatteras. Clients cancel trips when they hear a species has moved out of the area. Ditton *et al*. (1998) found that 44 percent of charterboat anglers opposed restricting North Carolina fishing to benefit other parts of the coast through a reallocation of bluefin tuna quota, while 57 percent of the private anglers opposed the measure.

Because Hatteras attracts top sport fishermen from around the world, the issues of minimum sizes and trophy fish take on special significance. Many fishermen are interested in

setting records by catching smaller bluefin tuna on fly rods. In 1997, the recreational bluefin tuna fishery for bluefin tuna measuring 27 inches to less than 73 inches was closed on March 2. Ditton *et al*. (1998) found that 60 percent would oppose a catch and release only for bluefin tuna; many want to retain the option of keeping a trophy fish.

Winter bluefin tuna fishing trips are made primarily on charter/headboats with only 27 percent of recreational bluefin tuna fishing trips made on private vessels (Ditton *et al*., 1998). Many of the charterboats in Hatteras are from other areas. They come for the winter bluefin tuna fishery but stay year-round. Ditton *et al*. (1998) found 51 charterboats in Hatteras during the 1997 bluefin tuna season. Researchers report tension between the local charterboats and the transient charterboats because of increased competition for both fish and customers. There is also tension with private recreational fishermen who follow the charter/headboats to see where they fish (Wilson *et al*., 1998).

Perhaps the most pressing issue for HMS fishermen in Hatteras is the status of the relatively new winter fishery for bluefin tuna. In their study of the 1997 bluefin tuna fishing season, Ditton *et al*. (1998) found that bluefin tuna anglers spent $3.6 million dollars in Hatteras in two and one-half months in the 1997 winter season. They estimate that this meant a $7.6 million impact on the output of the Hatteras area economy and supported 170 jobs. Dare County unemployment estimates indicate that the bluefin tuna fishery may have reduced unemployment by eight percent during the first quarter of 1997. Unemployment in Dare County in March 1998, a year when the bluefin tuna did not show up in numbers anywhere near the 1997 level, was 29 percent higher than in March 1997.

Respondents view and respond to the winter fishery very differently, even disagreeing on the year it started. Because of the unpredictability of the appearance of bluefin tuna and the duration of their stay, there is uncertainty among local businesses about whether or not to invest further and stay open during winter months. Those who now have winter jobs, and those who hire them, have a different perspective. Businesses are generally pleased to retain year-round employees rather than hiring and training seasonally. Finding a place to live on Hatteras Island is already difficult for low wage workers. Many people, especially fishermen, do not think the winter fishery will last.

Fisheries management is a divisive issue in Hatteras Village. It has exacerbated the tensions between the long-term, local charterboats and the private yachts. Some see these "hobbyists" as the ones who are dominating fisheries management through their joining politically active fishing organizations. The individual recreational anglers that Ditton *et al*. (1998) interviewed are not particularly hostile to commercial fishermen. Commercial and recreational fishermen still see themselves as being part of the same fishing-based community and many come from the same families. Many fishermen cross over, seasonally or permanently, between the recreational and commercial sectors. Several respondents in this community expressed personal disappointment at the growing animosity between the two sectors. Researchers found there to be general support of the fishing industry from the non-fishing public.

Community Impacts in Hatteras, North Carolina

The final actions in this FMP provide for sustained participation in the fishing communities of Hatteras, while minimizing economic impacts to the extent practicable. The ICCAT Rebuilding Program for bluefin tuna is unlikely to have any social impacts on the rod and reel fishing community in Hatteras, since the U.S. quota will not change substantially and this FMP maintains status quo allocation patterns. In fact, handgear categories could generate a slight increase in angler consumer surplus. This FMP also establishes a recreational retention limit of three yellowfin per person per day. This measure is not likely to have major social impacts to the recreational fishing community in Hatteras because LPS data indicate that although 79 percent of trips have three or more anglers on board, only five percent of trips land more than nine yellowfin tuna. Based on an average size of 33 pounds, this measure still allows approximately 99 pounds of yellowfin tuna to be landed by each recreational fisherman on a trip. Moreover, since North Carolina had established voluntary bag limits prior to the implementation of this FMP, most charter/ headboats and private anglers do not exceed three yellowfin per person per day. Given the additional management measures established in the Amendment to the Billfish FMP, fishermen may feel that they are being over-regulated. However, the recreational fishing community of Hatteras appears to pride itself on its catch-and-release conservation ethic.

Expanding the list of prohibited shark species to include dusky sharks is likely to have moderate social impacts for the recreational HMS fishery in Hatteras by essentially establishing a catch and release fishery for this trophy species. The other species included in the prohibited species management unit are unlikely to have any social impacts on the recreational fishery because most fishermen do not harvest these species. Additionally, the final action to not add blue sharks to the prohibited species management unit should minimize social impacts.

Establishing a minimum size of 4.5 feet for sharks in the recreational fishery may have differential social impacts in that there may be substantial impacts on nearshore anglers by essentially establishing a catch and release fishery for sharks in near-shore waters, while there may be minor impacts for offshore anglers because most sharks harvested offshore are larger than this minimum size. Reducing the recreational retention limit is likely to have moderate social impacts by limiting charterboat and tournament operations that want to retain their shark catches. Although sharks are not often the primary target species, they are encountered incidentally to tunas. An increasing catch-and-release ethic among anglers may mitigate any negative impacts. The final action to establish an allowance of one Atlantic sharpnose shark per person per trip should also minimize social impacts. Additionally, anglers may be willing to pay more for the opportunity to catch larger sharks once the stocks rebuild, resulting in positive social impacts in the long term. Cumulatively, the final management actions for sharks are likely to have some social impacts in the recreational HMS fishery in Hatteras although NMFS maintains that the long-term benefits of rebuilding outweigh the short-term costs for this community.

The requirement for charter/headboat vessels to obtain a permit and submit logbooks will have an economic impact for vessels that do not already have a Charter/Headboat permit for tunas. The charter vessel owner will be charged a fee for the vessel permit (probably $20 to $40) to cover administrative costs. The logbook will cost the charter captain time to fill

out and send to the appropriate NMFS office. However, public comment at scoping meetings and at HMS AP meetings indicated significant support for this alternative among charter/headboat captains. Many captains already fill out logbooks on a voluntary basis and feel that faxing or mailing their report to NMFS is a small burden but a worthwhile means of supporting more effective HMS management. Tournament registration for all HMS will impose an additional reporting burden on shark and tuna tournament operators who are not currently reporting on billfish tournament forms. Overall, these measures are not likely to have large social impacts on the recreational fishing community in Hatteras.

9.5.2 Wanchese

Wanchese is located on the southern part of Roanoke Island, in the northern Outer Banks. This small fishing village is said to have "changed as little as those who have lived here for generations" (Cutchin, 1997). Wanchese's first seafood dealer was opened in 1936 by a family that still operates two dealers in the community. The village continues to revolve around fishing and fish processing. The Wanchese Seafood Industrial Park was constructed in 1980 by the state; it has 30 acres of leasable land, a 15-acre deep water harbor, and 1,500 feet of commercial-style concrete docks, and seven seafood-related businesses. (CNCSS, 1993). The industrial park is also the scene of the annual blessing of the fleet, which is organized by the Oregon Inlet Users Association.

There are approximately 117 small businesses in Wanchese, 44 of which are commercial fishing or charter fishing businesses (CNCSS, 1993). Support industries, such as vessel builders and seafood packers, are also of great importance to the commercial fisheries. There are three major dealers in Wanchese. One dealer, which specializes in scallop and flounder, has fourteen vessels including trawlers, scallop vessels and smaller vessels for gill netting as well as two scallop vessels in Alaska (CNCSS, 1993). They have three packaging and processing houses, a fish-packing house and processing and freezing operations (located in North Carolina, Virginia, and Massachusetts). Seafood is distributed locally and nationally by truck and internationally by air freight. The second dealer, which specializes in hooked fish, is an important seafood distributer. This is the company most likely to be affected by this FMP. While only operating one vessel, this company buys regularly from 35 local and over 70 non-local vessels. The third dealer, which specializes in bulk fish, packs the fish from its own two vessels. Transportation of their product is set up through an agreement with the Wanchese Fish Company (CNCSS, 1993).

Recent growth in tourism and recreational fishing has sparked competition for a restricted resource. However, commercial and recreational fishermen still see themselves as being part of the same fishing-based community and many come from the same families. Members of the non-fishing public are generally supportive of the fishing industry. Unlike the surrounding communities, Wanchese has very little seasonal variation in employment resulting from tourism; what seasonal fluctuations do exist are caused by the availability of the fisheries resources and are countered by the flexibility and opportunistic nature of the Wanchese fishermen (CNCSS, 1993).

Demographic Profile of Wanchese (Source: U.S. Bureau of the Census, 1990)

Population: 1,374 residents in Nags Head/Roanoke Island/Wanchese (CNCSS, 1993); 51 percent male and 49 percent female.

Racial and Ethnic Composition: 98 percent Caucasian, greater than one percent American Indian. The ethnic composition of Wanchese is primarily European ancestry.

Age Structure: 46 percent aged 15 to 44; 26 percent under age 15; 27 percent above age 44.

Marital Status: 69 percent married; 18 percent never-married; eight percent divorced; and five percent are widowed.

Household Composition: 503 households; average of 2.69 persons per household.

Educational Trends: Of people 25 years and older, 67 percent are high school graduates.

Per Capita Income (1989): $10,830; state average $12,885.

Employment Trends: Of residents 16 years and older, 85 percent participate in the civilian labor force. The unemployment rate is ten percent. Of the employed population, approximately 61 percent work in private, for-profit companies, 17 percent work for local government, and 19 percent are self-employed. The agriculture, forestry and fisheries industries employ nearly 20 percent of the employed persons over 16 in Wanchese, more than any other employment sector; other major employers include the retail trade (19 percent) and professional and related services (16 percent).

Fishing Organizations: Fishing related associations include the Oregon Inlet Users Association and the North Carolina Fisheries Association. The former is involved with supporting the plans for jetties at Oregon Inlet and are responsible for organizing both the Wanchese Seafood Festival and the Blessing of the Fleet. The latter is a trade organization of seafood dealers and commercial fishermen from the state; two members of the 18-member Board of Directors are from Wanchese (CNCSS, 1993).

The Mid-Atlantic Pelagic Longline Fishery

A large number of commercially important marine fish species are landed in Wanchese, including inshore and offshore species. Many fishermen emphasized that they have to be versatile due to quick changes in water temperature and therefore in availability of species in the area (Wilson *et al*., 1998). The species that longline fishermen target off the mid-Atlantic coast include swordfish, sharks, and tunas (primarily, yellowfin and bigeye). Although targeting bluefin tuna with longline gear is prohibited, there is an incidental catch allowance of bluefin tuna as part of other fishing operations. Fishermen aboard large longliner vessels fish for swordfish, tunas, and dolphin. Because of the weather, tunas and swordfish are accessible to the medium-sized vessels that gillnet for other species and longline in the summer. Respondents explained that they also gillnet for dogfish, bluefish, and Spanish

mackerel (in spring and fall), and trout and croaker (in winter). They also bottom fish for bass and grouper. There are a number of vessels that gillnet in some seasons and then switch over to charterboat fishing in the summer. Other fishing activities in Wanchese include trawling trips for squid in the summer, and fishing for weakfish, croaker, and flounder in the winter. Market considerations are crucial in deciding which species should be targeted by longline vessels (Wilson *et al*., 1998).

Researchers found pressure on this sector of the longline fishery to be substantial. Hiring and managing crew for pelagic longline vessels is increasingly difficult, especially for the larger vessels that need people to stay on for longer trips. There is a lot of turnover in fishing crews, particularly when vessels shift to other fisheries and revenue drops. Many of the larger vessels have already left, and experienced fishermen are finding work overseas and other captains and vessel owners are searching for alternatives to commercial fishing. Some have switched to carpentry and building and others have gone into the charter fishing business. Finding alternative permanent work may prove difficult for many fishermen who are highly skilled in their profession but have less formal education than the average worker (Wilson *et al*., 1998).

Larger dealers have been responding to the decline of local fisheries by dealing on an increasingly global basis. This region has a number of other fisheries (e.g., scallop, flounder, monkfish, and dogfish), but most are severely restricted and offer little opportunity as an alternative to pelagic longline fishing. This is particularly true for larger longline vessels, though they also have the option of steaming farther offshore to target tunas, swordfish, and dolphin. However, they may be limited in their ability to pursue this alternative by prices and commercial retention limits.

One dealer representative reported that shark (including dogfish), tuna, and swordfish sales now make up 40 percent, 40 percent, and ten percent of business, respectively, while in the recent past they comprised 25 percent, 50 percent, and 15 percent of business, respectively (Wilson *et al*., 1998). They report decreased prices for swordfish, between $3.25 and $4.25 per pound. Dealers are concerned that this is due to an increase in imports. The dealers have tried to make up for lost business and low prices by expanding overseas, but it has not worked well. The swordfish boycott is also having a strong effect because the restaurants and retail markets that are participating in the boycott are the upper-end of the market. Dealers in this community maintain that high quality is the American fleet's key market advantage over swordfish imports.

Generally, researchers found that increased restrictions on swordfish and BAYS tunas will lead to increased pressure on dolphin and inshore species as well as increased movement of longline assets overseas. This would be accompanied by a decline in average vessel size in the fleet as larger vessels are more likely to be sold or to leave. Community level impacts could be exacerbated by cutbacks in the scallop fishery that is important in Wanchese. Limits on soak time would increase the costs of catching fish on all vessels and affect larger vessels more than smaller vessels. Other participants expressed concern that, while VMS would increase safety, it would also be very expensive for smaller vessels. Researchers reported

that adverse impacts would be felt most severely in the winter months when the tourist economy is less able to absorb people displaced from commercial fishing.

The Shark Bottom Longline Fishery

By regulation, there are two six-month seasons for the shark fishery, one that runs from January to June and a second from July to December. Traditionally, fishermen on larger longline vessels go shark fishing from January until the closure of the first half of the shark season, and then fish with pelagic longlines for tunas or swordfish. HMS landed by these vessels supply the restaurants in the local area with fresh products. Commercial fishermen and dealers do not like the fact that closures of the shark fishery lead fishermen to shift at the same time from species to species, because it causes prices to drop. Some marginal fishermen are driven out of the market by the low prices associated with these shifts (Wilson *et al*., 1998). Shifts in targeted species may also require changing gear, which can be expensive.

If the shark season were open in September and October, fishermen indicated that they would prefer to fish for sharks at that time. Shark commercial retention limits have made shark fishing less economical for larger vessels; many steam north to fish off New York. Some respondents were supportive of limited entry or ITQs in the shark fishery. When questioned about size limits on sharks, fishermen reported concern about increased discards. However, they already prefer larger sharks because they are more marketable, suggesting that size-driven discarding may already be occurring. Participants also reported that prohibition of retaining dusky sharks would have a substantial impact on Wanchese fishermen.

Community Impacts in Wanchese, North Carolina

Accounting for dead discards in swordfish management could result in an estimated 13-percent decrease in total revenues in the swordfish fishery, beginning in 2000. This estimate is based on the weight of 1997 dead discards relative to 1997 total mortality in the U.S. north Atlantic swordfish fishery. This measure may also affect the timing of closures of the directed fishery. If ICCAT adopts an international ten-year rebuilding program for north Atlantic swordfish, it could result in a 27-percent decrease in TAC for the United States; negative impacts to revenues that are associated with this action would be large. Some vessels that rely heavily on swordfish revenues would be forced to shift some effort to other fisheries or exit fishing altogether. Displaced effort would depend on region and type of gear; some may shift effort to longlining for dolphin, wahoo, and BAYS; snapper-grouper fishery (although there is limited access); mackerel, squid and butterfish trawl fisheries.

The requirement to have VMS onboard every pelagic longline vessel fishing for HMS will involve a substantial one-time cost ($1800 for unit plus $100 for installation) for the pelagic longline community in Wanchese, but this measure is necessary to implement time area closures effectively. Together, the measures in the swordfish rebuilding plan and the VMS requirement are likely to have some social impacts on the pelagic longline community

of Wanchese, but NMFS maintains that these actions are necessary to rebuild the swordfish fishery.

The final action closing an area to pelagic longlining off the mid-Atlantic coast from 39 to 40° N and 68 to 74° W during June will likely affect the longline fleet based in Wanchese, although it is not expected to have a significant impact on landings of target species such as sharks, swordfish, and tunas other than bluefin. If fishermen decide to displace effort to other areas, fishing costs for fuel, bait, and ice may increase. In addition, travel time to the fishing grounds may increase. However, because the closure is effective only during the month of June, this possible increase in fishing costs should not be significant. This time/area closure may also have an impact on entities such as seafood processors and other related businesses in the area. While fishing effort will be displaced to other locations for a short time, this action will most likely not have significant adverse impacts on the longline community of Wanchese.

There are also potential concerns regarding safety-at-sea associated with this time/area closure. NMFS received comments that the initially proposed four by four degree closed area would force vessels to travel through, and fish in, a dangerous area of the Gulf Stream. This was a particular concern for some of the smaller vessels which would have to travel farther even though the fuel capacity of their vessels is limited. The modification of the closed area to the selected one by six degree area should mitigate some of these concerns especially since the selected area does not include the dangerous area referred to in most of the public comments.

This FMP establishes the foundation to develop an international rebuilding plan for Atlantic bigeye tuna. SCRS has strongly recommended that Atlantic-wide landings be reduced to 1992 levels. This would involve at least a six-percent reduction in Atlantic-wide landings from 1997 levels. The United States would implement the international rebuilding program through domestic measures including quotas, increased minimum sizes and/or retention limits, as appropriate. A six-percent reduction in commercial landings would mean a similar reduction in revenues. Since bigeye tuna are not often a recreational target, except in specific areas at certain times of the year, and since many trips targeting bigeye tuna may also target and land yellowfin tuna and vice versa, it is difficult to say what a reduction in bigeye tuna landings would mean to angler consumer surplus. It would most likely go down, but the extent to which it would go down is unknown. The pelagic longline fishery of Wanchese could be affected by the rebuilding plan, although the extent of the community impacts cannot be assessed at this time since ICCAT has not yet adopted a rebuilding program for bigeye tuna.

The minimum size for ridgeback sharks may substantially change the way in which the large coastal shark fishery operates, especially since observer data indicate that some fishermen have increasingly targeted juvenile and subadult sandbar and dusky sharks in recent years. It will force fishermen further offshore to target adult fish, possibly increasing the number of days per trip and increasing the cost of fishing. Some fishermen have already left the fishery as a result of the 50-percent quota reduction for large coastal sharks in 1997. This measure may result in severe economic effects in the short term with a permanent loss of

fishermen and community infrastructure. Reducing the non-ridgeback large coastal shark quota is likely to have substantial social impacts on the shark bottom longline fishery in Wanchese because blacktip sharks, the primary non-ridgeback species, are frequently caught and landed in this fishery. The cap on the commercial quota for small coastal sharks will limit opportunities for fishermen to expand their current operations to target small coastal sharks as an alternative to large coastal sharks. The economic impact of a sandbar-based minimum size for ridgeback large coastal sharks may be pronounced in North Carolina, particularly in the winter season, since these communities have increasingly targeted juvenile and subadult dusky sharks over the past few years. However, this action will shorten the time it takes to rebuild the stocks that are critical to the commercial shark fishery in Wanchese. An economically viable fishery, without market gluts and short seasons will have long-term benefits for this community.

Counting dead discards and landings in state waters after Federal closures against the Federal shark quota will likely have substantial social impacts by reducing the available quotas. Currently, many states continue to allow their fishermen to land large coastal sharks after a Federal closure. When these landings are counted against the next year's Federal quota, the already short Federal shark seasons are likely to become even shorter. Although a North Carolina proclamation has effectively eliminated commercial shark fisheries in state waters, coastwide landings of large coastal sharks and unclassified sharks in state waters after Federal closures are large enough that, in combination with counting dead discards against the quota, Federal waters may not even open. This action may put some fishermen out of business in Wanchese, shorten the fishing season, cause market gluts, and lower ex-vessel prices. It may also increase variable costs and decrease gross revenues by pushing fishermen out of waters where sharks are abundant and into waters where target species are also less abundant.

The final action prohibiting dusky sharks will likely have adverse social impacts in Wanchese, particularly for those fishermen that have increasingly targeted dusky sharks in recent years. This measure will likely reduce revenues, perhaps substantially for some Wanchese fishermen, because dusky sharks are preferentially retained in commercial fisheries, although they accounted for only two percent of large coastal shark commercial landings in 1997. The other species included in the prohibited species management unit are unlikely to have any social impacts on the shark bottom longline fishery because most fishermen do not harvest these species. Additionally, the final decision not to add blue sharks to the prohibited species management unit should minimize social impacts and allow for limited experimental blue shark market development to continue under the pelagic shark quota.

Scheduling shark fishery openings for specified periods may somewhat mitigate the negative social effects of the quota reductions. This measure is likely to increase the predictability of the large coastal shark fishery by eliminating the uncertainty of fishery closures and allowing more advance planning of fishing trips. It will also improve the ability of shark dealers and retailers to make long-term plans for marketing and advertising. Scheduled openings may reduce derby conditions and decrease the potential for market gluts, thereby increasing revenues. Season-specific quotas and adjustments for the commercial shark fisheries may have a small negative economic impact for commercial fishermen who

fish in the first season and a small positive impact for those who fish primarily in the second season. As North Carolina shark fishermen participate in both the first and second seasons, season-specific quotas may not reduce revenues but may increase fishing opportunities in the second season.

Together, the measures under the large coastal shark rebuilding program are likely to have significant negative social impacts in the shark bottom longline community of Wanchese. The final actions implementing a ridgeback large coastal shark minimum size and establishing season-specific quota adjustments may substantially alter the way the fishery operates, while the final actions to prohibit possession of dusky sharks, reduce the non-ridgeback large coastal shark quota, and account for all sources of mortality may essentially preclude the Federal large coastal shark fisheries from opening at all. The final actions implementing limited access and capping the small coastal shark quota may also limit the opportunities of Wanchese fishermen to expand fishing into state waters or other HMS fisheries. While these actions are likely to have substantial negative social impacts, NMFS maintains that the final actions to announce the fishery seasons ahead of time and not to prohibit possession of blue sharks may minimize the negative impacts to a limited degree. Nevertheless, NMFS is aware that the cumulative impacts of the shark measures in this FMP may put some fishermen out of business and result in a permanent loss of community infrastructure in Wanchese. NMFS implements these final measures despite the magnitude of the negative impacts on some communities, including the shark bottom longline community in Wanchese, in order to rebuild large coastal sharks and prevent overfishing of pelagic and small coastal sharks.

The limited access system implemented by this FMP may have minor social impacts on the shark bottom longline fishery in Wanchese; however, this system removes latent effort only and issues directed and incidental permits based on historical and current fishery participation in the swordfish and shark fisheries. Directed permits will allow fishermen to operate under the quotas, seasons, and commercial retention limits established under this FMP. Lower retention limits for incidental permit holders have been established to allow fishermen to continue to land fish in quantities similar to current levels. Transferability of permits also allows fishermen flexibility in business planning. Pelagic longline fishermen have generally been supportive of a limited access program for these fisheries. Overall, NMFS maintains that the final actions in this FMP are necessary to meet the conservation requirements of the Magnuson-Stevens Act. These measures provide for sustained participation in the fishing communities of Wanchese, within the constraints of the resource, while minimizing economic impacts to the extent practicable.

9.6 Florida Community Profiles

Demographic Profile of Florida (Source, U.S. Bureau of the Census, 1990)

Population: 12,937,926

Education: 74 percent of residents 25 years and older graduated from high school.

Employment: 5.8 percent of the civilian labor force is unemployed. The main source of employment is the retail industry sector (20 percent); agriculture, forestry, and fisheries account for three percent.

Per capita income (1989): $14,698.

Fisheries Characteristics of Florida:

In 1996, commercial landings of bluefin tuna on the Atlantic coast of Florida totaled less than 2.0 mt, accounting for less than one percent of the total U.S. Atlantic bluefin tuna landings. The ex-vessel gross revenues of these landings were nearly $13,000, representing less than one percent of the total for commercial bluefin tuna landings in the Atlantic and Gulf states. Swordfish landings on Florida's Atlantic coast totaled approximately 500 mt, accounting for approximately 22 percent of the total swordfish landings in the Atlantic and Gulf states. The ex-vessel gross revenues of these landings were nearly $3.8 million, approximately 24 percent of the total for swordfish landings in the Atlantic and Gulf states. Landings of large coastal sharks along the Atlantic coast of Florida totaled in excess of 1,000 mt, with ex-vessel gross revenues of nearly $2.1 million (NMFS).

Landings of bluefin tuna along the Gulf coast of Florida totaled only 538 pounds, due to a closure of the directed fishery in the Gulf of Mexico, which is a spawning ground for bluefin tuna. These landings were valued at $1,267, representing less than one percent of the total economic value of U.S. Atlantic bluefin tuna landings (NMFS). Landings of swordfish along the Gulf coast of Florida totaled approximately 372 mt, accounting for nearly 17 percent of the total swordfish landings in the Atlantic and Gulf states. These landings were valued at over $2.8 million, approximately 18 percent of the total economic value of swordfish landings in the Atlantic and Gulf states (NMFS). Landings of large coastal sharks along the Gulf coast of Florida totaled nearly 1,134 mt, with a value of over $2.5 million (NMFS).

In 1996, expenditures by saltwater anglers in Florida totaled over $2.2 billion, accounting for nearly 26 percent of the total U.S. expenditures by saltwater anglers. Saltwater fishing in Florida generated an impact of over $4.1 billion (more than 16 percent of the U.S. total), generated wages and salaries of nearly $1.2 billion and created more than 56,000 jobs (ASA, 1996). It is unknown what percentage of this total may be attributed to HMS fisheries.

Communities along the Atlantic coast of Florida that are likely to be affected by the HMS Fishery Management Plan include fisheries in the following towns: Cape Canaveral, Dania, Daytona Beach, Fort Lauderdale, Fort Pierce, Islamorada, Jacksonville, Key West, Lighthouse Point, Marathon, Miami, New Smyrna Beach, Pompano Beach, Port Orange, and St. Augustine (Table 9.9). Communities along the Gulf coast of Florida that are likely to be affected by the HMS FMP include fisheries in the following towns: Apalachicola, Clearwater, Destin, Fort Myers, Fort Walton Beach, Gulf Breeze, Madeira Beach, Pensacola, St. Petersburg, Tampa, and Tarpon Springs (Table 9.10). Madeira Beach, Pompano Beach and Islamorada were chose as representative communities by the researchers.

Table 9.9 Fisheries characteristics of Florida Atlantic coast communities affected by the HMS FMP. (NMFS, 1997)

Community	Bluefin Tuna Landings *dressed weight in metric tons (mt)*	Bluefin Tuna Landings *rank by weight*	Commercial Tuna Permits *number*	Commercial Tuna Permits *rank*	Recreational Tuna Permits *number*	Recreational Tuna Permits *rank*	Swordfish Landings *# of fish*	Swordfish Landings *rank*	LC Shark Landings *# of fish*	LC Shark Landings *rank*
Cape Canaveral	0.7	2	9		11					
Dania	0.2	4	4		1					
Fort Lauderdale			24	1	42	2				
Lighthouse Point			2		8		687	5		
Pompano Beach	0.4	3	17	6	11		5,126	3		
Daytona Beach			8		23	5				
New Smyrna Beach			9		12	9	772	4	270	5
Port Orange			3		7				1,141	3
Fort Pierce	0.9	1	20	4	22	6	6,758	2	2,682	1
Islamorada			20	4	10					
Key West			24	1	2					
Marathon			11	10	6		291	7	320	4
Jacksonville			10		30	4	185	10	133	9
Miami			22	3	51	1	12,332	1	1,212	2
St Augustine			14	7	38	3			138	8

Table 9.10 Fisheries characteristics of Florida gulf coast communities affected by the HMS FMP. (NMFS, 1997)

Community	**Bluefin Tuna Landings** ***dressed weight in metric tons (mt)***	**Bluefin Tuna Landings** ***rank by weight***	**Commercial Tuna Permits** ***number***	**Commercial Tuna Permits** ***rank***	**Recreational Tuna Permits** ***number***	**Recreational Tuna Permits** ***rank***	**Swordfish Landings** ***# of fish***	**Swordfish Landings** ***rank***	**LC Shark Landings** ***# of fish***	**LC Shark Landings** ***# of fish***
Apalachicola	0.2	3	1							
Clearwater			3	7	1		201	7	108	5
Madeira Beach	0.1	5	14	4	1		600	6	174	4
Saint Petersburg			4	6	2		614	5	226	2
Tampa			1		3	7			265	1
Destin	0.3	1	36	1	20	2	931	3	220	3
Fort Myers	0.2	2	3	7	1		1,217	2	25	7
Fort Walton Beach			1		7	5				
Gulf Breeze			6	5	15	3				
Panama City	0.2	4	34	2	12	4	654	4	100	6
Pensacola			27	3	72	1				
Tarpon Springs			1		2		2,689	1		

Table 9.11 Demographic characteristics of Florida Atlantic coast communities affected by the HMS FMP. (U.S. Bureau of the Census, 1990)

Community	1990 Census Population	Sex Ratio M/F	% Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry & Fisheries Industry
Cape Canaveral	8,014	1.11	33.5	83.2	6.8	$16,397	1.5
Dania	13,024	0.93	39.1	60.6	8.9	$13,006	2.6
Fort Lauderdale	149,377	1.01	37.2	67.7	6.7	$19,814	1.8
Lighthouse Point	10,378	0.85	56.5	85.1	4.4	$28,696	1.3
Pompano Beach	72,411	0.93	44.7	73.7	6.3	$17,382	3.0
Daytona Beach	61,921	0.98	35.7	73.6	7.9	$11,901	1.6
New Smyrna Beach	16,543	0.86	54.0	79.4	6.9	$14,501	2.7
Port Orange	35,317	0.93	60.8	79.8	4.6	$13,391	1.6
Fort Pierce	36,830	0.89	43.0	56.9	12.4	$9,961	9.8
Islamorada	1,293	1.18	43.8	77.8	1.2	$24,651	6.8
Key West	24,832	1.14	44.4	79.9	3.3	$15,547	2.2
Marathon	8,857	1.10	52.6	72.0	3.9	$16,790	9.0
Jacksonville	635,230	0.95	53.2	76.4	5.7	$13,661	1.2
Miami	358,548	0.93	40.0	47.6	11.0	$9,799	1.8
St Augustine	11,692	0.90	42.2	75.7	5.6	$12,012	1.3

Table 9.12 Demographic characteristics of Florida Gulf Coast communities affected by the HMS FMP. (U.S. Bureau of the Census, 1990)

Community	1990 Census Population	Sex Ratio M/F	% Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry & Fisheries Industry
Apalachicola	2602	0.86	45.4	52.9	8	$7,277	5.4
Clearwater	98,784	0.86	48.2	80.2	4.8	$16,726	1.1
Madeira Beach	4,225	1.04	43.7	83.8	2.8	$17,301	1.4
Saint Petersburg	238,629	0.86	44.4	75.1	5.2	$14,132	1.5
Tampa	280,015	0.93	42.2	70.6	6.7	$13,277	1.7
Destin	8,080	0.95	60.3	88.1	2.8	$19,018	3.9
Fort Myers	45,206	0.95	39.8	68.4	6.2	$12,329	3.2
Fort Walton Beach	21,471	0.94	56.9	85.9	5.5	$13,690	1.0
Gulf Breeze	5,530	0.97	64.4	93.2	5.1	$21,243	2.2
Panama City	34,378	0.88	48.7	70.3	8.1	$12,169	1.5
Pensacola	58,165	0.84	46.2	79.1	7.6	$14,795	0.7
Tarpon Springs	17,906	0.92	58.3	74.2	6.9	$13,557	3.2

9.6.1 Islamorada

Located in the Florida Keys, Islamorada calls itself the Sportfishing Capital of the World because of its proximity to the Florida Bay, the Everglades, bonefish flats, coral reefs and the Gulf Stream. Islamorada is famous for light tackle technique and many different rods have been developed in this community. It is now increasingly a recreational fishing community, with many charterboats that troll for yellowtail snapper, grouper, blackfin tuna, dolphin, wahoo and billfish in inshore waters. Recreational activities in the Keys consist of trophy fishing, catch and release, spear fishing, and fishing for food. More recently, there has been a growing interest in the guided fishing industry that promotes catch and release (Bohnsack, 1994). According to the Florida Bureau of Vessel Titling and Registration, Monroe County has a total of 23,079 registered vessels, with 18,731 pleasure and 4,260 commercial vessels as of 1996. There are eleven marinas in Islamorada.

Tournaments are an important marketing device for tourism in this town. The majority of vessels in Islamorada tournaments are Florida vessels, but there are some out-of-state participants. The Tourist Development Council of the Florida Keys has a large marketing budget and gives grants and sponsorship to tournaments. A new tackle shop employs 57 people and plans to open a fishing school next year that will employ six teachers and teach 24 people at a time for three to four days. Other water-related tourist businesses include powerboat rentals, boat tours, cruises, kayak, wave runner and sailboat rentals, snorkel and dive shops, boat dockage, lifts and repair shops, and fishing supply shops.

The largest resort in Islamorada began as a fishing marina and sportfishing is a big part of their marketing. The resort has two sets of vessels offshore and "back country," the local term for the Florida Bay area. There are 19 "six-pack boats" which are charterboats and one headboat. In the winter, charter/headboats fish for sailfish, blackfin tuna, and bonito. Recreational fishermen in this community feel that retention limits, minimum sizes, voluntary catch and release, and other management measures are effective. Florida's ban on inshore net fishing is also considered a success; sea trout are plentiful because of the net ban, as are bonefish, pompano, and Spanish mackerel. They are concerned with other commercial fishing activities, particularly driftnets and longlines.

According to the Monroe County Cooperative Extension Service, fishing is better as a result of regulations. However, some charter/headboat captains are pessimistic about the future. They feel that the overall fishing picture is not good, and say that they have lost customers because there are not as many fish to target (Wilson *et al*., 1998). There is a general concern in Islamorada that it would be devastating to the community if the fish stocks are depleted. There are a lot of concerns with habitat such as the loss of grass beds, destruction of mangrove shoreline, water quality, algae blooms, and coral reefs dying from ozone depletion and too much sunlight. Some people are concerned with runoff from the lower part of the peninsula including phosphates and exhaust. There is also a concern over an increasing number of fishermen in the area. (Wilson *et al*., 1998).

Demographic Profile of Islamorada (Source: U.S. Bureau of the Census, 1990)

Population: 1,293

Racial and Ethnic Composition: 95 percent Caucasian, 0.9 percent African-American, and 4.1 percent other races. The highest incidence of a single ethnicity is found in residents with German ancestry, which make up 15 percent of the population. In recent years, more people of Hispanic origin moved into the area and commuted throughout the region for jobs.

Age Structure: 44 percent aged 15 to 44; approximately one-third of the population is under 15 and one-third is over 44.

Marriage: 59 percent married; 17 percent never-married; and 17 percent are divorced.

Household Composition: 672 households; average of 1.86 persons per household.

Education Trends: Of people 25 years and older, 78 percent graduated from high school.

Employment: Unemployment rate is 1.2 percent of the labor force; state average 5.8 percent. Of the residents 16 years and older, approximately 73 percent participate in the civilian labor force. The five most dominant industries in terms of employment are retail trade (39.4 percent), personal services (12.5 percent), professional and related services (8.0 percent), transportation (7.2 percent), and agriculture, forestry, and fisheries (6.8 percent).

Fishing Organizations: One of the prominent fishing organization in this area is the Matecumbe Anglers Club.

The Pelagic Longline Fishery

There are only two small longline vessels that dock in Islamorada (see the Pompano Beach profile for a description of this fleet). Due to limited range and safety concerns about venturing farther offshore, this small vessel fleet fishes year-round in nearby waters. Dolphin fish is the primary alternative to HMS for pelagic longline vessels. Researchers found that the commercial fishing community has an increasingly smaller niche relative to recreational fisheries. They cited limited entry in the snapper, king mackerel, and crab fisheries; a ban on net use in inshore waters in Florida; and incidental catch limits for bluefin tuna as limiting factors for the commercial fisheries. Florida Keys National Marine Sanctuary has also proposed a “no take” zone policy, which will put many commercial fishermen out of business (Sheldone, 1996).

Skilled captains were found to be seeking employment in the Bahamas, as well as the growing longline fleets in South Africa and South America, while the longline supply business has shifted its emphasis to supplying foreign fleets. In Islamorada, a growing recreational fishing industry provides alternative employment opportunities for commercial fishermen familiar with the area in the charter/headboat fleet and as fishing guides. However, unemployment is moderately high and the work force is fairly well-educated, so finding employment could be competitive.

Researchers also found that the pelagic longline fishery is vulnerable to price pressure from the swordfish boycott organized by the Give Swordfish a Break campaign. The main market niche for their high-quality, fresh swordfish is the group of high-end users that is responding to this boycott. While these vessels are experiencing increased difficulty with finding crew, this is significantly less of a problem for them than for larger pelagic longline vessels.

When questioned about limitations on soak time, fishermen responded that a six-hour soak time limitation would significantly increase the work they have to do to catch a fish and, given difficulties with recruiting enough crew, raises safety questions due to exhaustion. Fishermen indicated that limits on mainline length would not have as great an impact on the fishery. Commercial retention limits were viewed as an overall good because they prevent drops in price following the offloading of a very large vessel. Fishery participants reported that VMS would be a major expense for these small vessels, though they recognized that it would increase safety. Paying observer salaries would not be economically feasible for vessels of this size. Generally, researchers concluded that any significant decrease in volume or increase in direct costs would put many of the marginal small vessel operations out of business. At the present time, the longline fleet in Islamorada is not receiving community support beyond that supplied from within their own industry (Wilson *et al.*, 1998).

Community Impacts in Islamorada, Florida

Accounting for dead discards in swordfish management could result in an estimated 13 percent decrease in total revenues in the swordfish fishery, beginning in 2000. This estimate is based on the weight of 1997 dead discards relative to 1997 total mortality in the U.S. north Atlantic swordfish fishery. The limited access system implemented by this FMP may have minor social impacts on the longline fishery in Islamorada; however, this system removes latent effort only and issues directed and incidental permits based on historical and current fishery participation in the swordfish and shark fisheries. Directed permits will allow fishermen to operate under the quotas, seasons, and commercial retention limits established under this FMP. Lower retention limits for incidental permit holders should allow fishermen to continue to land fish in quantities similar to current levels. Transferability of permits also allows fishermen flexibility in business planning.

Overall, the final measures under this FMP for sharks may have substantial impacts for those longline fishermen in Islamorada who depend on shark fishing and may force captains and crew to pursue jobs in the recreational and charter fisheries. However, the final actions to announce fishery seasons ahead of time and establish season-specific quotas may minimize these impacts and increase the stability and predictability of shark fisheries, particularly large coastal shark fisheries. In selecting these final actions, NMFS aims to provide for the sustained participation in the fishing communities of Islamorada, within the constraints of the resource. Finally, NMFS maintains that the economic impacts have been minimized to the extent practicable while still meeting conservation goals and Magnuson-Stevens Act requirements.

The requirement for charter/headboat vessels to obtain a permit and submit logbooks may have an economic impact for vessels that do not already have a Charter/Headboat permit for tunas. The charter vessel owner will be charged a fee for the vessel permit (probably $20 to $40) to cover administrative costs. The logbook will cost the charter captain time to fill out and send to the appropriate NMFS office. However, public comment at scoping meetings and at HMS AP meetings indicated significant support for this alternative among charterboat captains. Since many captains already fill out such logbooks, they consider faxing their report to NMFS a small burden when weighed against the benefit of supporting more effective HMS management.

9.6.2 Pompano Beach

Pompano Beach is small city directly adjacent to Ft. Lauderdale. The Ft. Lauderdale area is known as the "Yachting Capital of the World" and the "Venice of America" because of the vast canal system which extends throughout Broward County and creates 165 miles of waterfront in the region. Recreational fishing is a very important activity in Pompano Beach, mainly targeting billfish. According to Florida's Bureau of Vessel Titling and Registry, in 1996 and 1997 Broward County had 44,151 registered vessels, with 41,393 pleasure and 2,043 commercial vessels. In contrast to many Florida communities, a substantial amount of the recreational industry is supported by local people in addition to tourists; many small fishing tournaments attract about 75 percent local people and 25 percent tourists. Pompano Beach is also a globally important manufacturing center for commercial longlining equipment.

Demographic Profile of Pompano Beach (Source: U.S. Bureau of the Census, 1990)

Population: 72,411. Estimate for 1996 is 74,583 residents.

Racial and Ethnic Composition: 70 percent Caucasian, 29 percent African-American, and less than one percent other races. Those of Hispanic ancestry comprise approximately 20 percent of the population.

Age Structure: 40 percent aged 15 to 44; 45 percent over age 44; 15 percent under age 15.

Marriage: 53 percent married; 25 percent never-married; 11 percent widowed; and 11 percent divorced.

Household Composition: 31,891 households; average of 2.2 persons per household.

Education Trends: 73.7 percent of the population 25 years and older are high school graduates.

Per Capita Income: The per capita income for Pompano Beach in 1989 was $17,382; this is lower than the per capita income for Islamorada ($24,651); state average $14,698.

Employment: Unemployment rate for Pompano Beach is 6.3 percent of the civilian labor force; state average 5.8 percent. Of the residents 16 years and older, nearly 56 percent

participate in the civilian labor force. Of the 15 main industries in Pompano Beach, the five most dominant in terms of employment are: professional and related services (19.8 percent), retail trade (18.6 percent), construction (10.4 percent), finance, insurance, and real estate (9.3 percent), and business and repair services (6.5 percent). Agriculture, forestry, and fisheries industries employed three percent of the population.

Fishing Organizations: These organizations include the Florida Commercial Fishermen's Association and Blue Water Fishermen's Association.

The Pelagic Longline Fishery

Pompano Beach has a proud longlining heritage and there are several successful businesses that are still involved to some degree with the fleet (Wilson *et al.*, 1998). This gives the current small vessel fleet and other longline business some networks of support. At the same time, Pompano Beach is now increasingly a recreational fishing community. There is a great deal of tension between the recreational fishermen and the longliners. At the present time, researchers found that the longline fleet is not receiving community support beyond that supplied from within their own industry. Both sides acknowledge a problem with overfished stocks, but each often blames the other side.

Pompano Beach has a small pelagic longline fleet, remnant of a much larger fleet, that mainly targets tunas and swordfish. There is also some shark fishing farther north along the coast. Among the vessels that dock in Pompano Beach are five small (40 to 50 feet), short-trip, year-round longline vessels, and six or seven seasonal longline vessels. There are some larger pelagic longline vessels in the nearby town of Dania. The most intensive local fishing takes place December through April. Vessels in the resident fleet stay and are joined by many vessels that come from the north to fish during the winter. From April through the end of June, fishermen on the larger longline vessels fish in the South Atlantic Bight and land most of their catch in Charleston, South Carolina. The smaller longline vessels fish year round in the Gulf of Florida. The longline fleet conducts business with two seafood dealers in Pompano Beach and one in Dania.

Commercial fishermen in Pompano Beach are proud of the role they have played in the development of the longline industry and report that monofilament longline was created and perfected in Pompano Beach. A group of charter vessel captains, the "Mosquito Fleet," began experimenting with longlines and various fish attraction devices in the 1970s. Three of these people opened a dealer to specialize in pelagic fish. A related company built the first distant water swordfish fleet in the southern United States. By the early 1980s, the fleet was developing and the geographical range of operations was increasing. They sold the smaller vessels and acquired 680-foot vessels that could move north and follow the fish. They moved from short trips to week long trips. By 1983, they were fishing on George's Bank and would be gone for two to three weeks. The Pompano Beach longliners began to invest in even larger vessels in the mid 1980s. This meant, however, that the best captains were gone for longer and longer times. Family problems, divorces and dislocations became issues in the community.

By the late 1980s, the eight largest vessels in the Pompano pelagic longline fleet had gone to Hawaii. The better captains began to get out of the business because they had to travel so much. The mates that took over were less skilled and this increased the amount of time that the home offices had to spend on absentee management. There was increased competition from imported fish and ICCAT catch restrictions for swordfish were becoming tighter. With Bahamian independence, the fleet lost access to waters near the Bahamas which had been very important for the smaller longline vessels, less than 50 feet in length. Researchers also found that the small vessel fishery is vulnerable to price pressure from the swordfish boycott that was organized by a coalition of conservation groups, because their main market niche is the high-end users that are responding to the boycott. An increase in the minimum size to 41 pounds would mean throwing back substantial amounts of swordfish and considerable loss in income. The development of the Pompano Beach area for yachting and recreational fishing has made dockage and access to the water more expensive. Swordfish closures have reduced income by shifting effort to less valuable species. A dealer whose business was once comprised of 88 percent swordfish and 12 percent tunas now reports dealing with 59 percent swordfish, 12 percent tunas, and 29 percent dolphin.

Respondents reported that as recently as 1994, crew used to line up for work. All commercial respondents reported increased difficulty in getting quality crew. The smaller vessels take two crew plus the captain. Owner-operators often try to have at least one crew member with them consistently, and then find anyone they can for particular trips. The end result of all of these factors has been a substantial reduction of the Pompano Beach longline fleet. For example, the company that sent the eight vessels to Hawaii, and owned ten other longliners as well, now owns only two vessels. They report that they have kept these vessels only because the grandchildren want to stay attached to the commercial fishery. This company has successfully developed other aspects of their business. Pompano Beach's remaining fleet is considered, by both its owners and suppliers, to be in major trouble (Wilson *et al*., 1998). Skilled captains were found to be seeking employment in the Bahamas, as well as with the growing longline fleets in South Africa and South America, while the longline supply business has shifted its emphasis to supplying foreign fleets. In the urban economy of Pompano Beach, non-fishing alternatives for fishermen exist. However, unemployment is moderately high and the work force is fairly well-educated, so finding employment could be competitive. Snapper, king mackerel, and red crab are all limited entry fisheries. Dolphin, however, is a profitable alternative during the spring swordfish closure.

When questioned about limitations on soak time, fishermen responded that a six-hour soak time limitation would significantly increase the work they have to do to catch a fish. Given difficulties with recruiting enough crew, it also raises safety questions due to exhaustion. Fishermen indicated that limits on mainline length would not have as great an impact on the fishery. Commercial retention limits were viewed as a good idea because they prevent drops in price following the offloading of a very large vessel. Fishermen reported that VMS would be a major expense for these small vessels, though they recognized that it would increase safety. Paying observer salaries would not be economically feasible for vessels of this size. Generally, researchers concluded that any significant decrease in volume or increase in direct costs would put many of the marginal small vessel operations out of

business. They found that the major longline supply companies in Pompano Beach have already adjusted to serving a global market, while those in nearby Dania are still substantially involved in domestic business (Wilson *et al*., 1998). Tackle and equipment suppliers are not impacted as much as the fishermen by changes in U.S. regulations since they can sell overseas. Similarly, dealers can compensate for a drop in volume of domestic fish by importing fish instead.

Fishermen, and other businesses related to commercial longlining in Pompano Beach, are increasingly turning their attention overseas. One longline equipment supplier reported that only 15 percent of his business is domestic. He has seen sales of longline equipment in Chile double three times since the early 1990s. When he first went to Uruguay in 1990, that country had one vessel; now he estimates that they have ten, while Brazil's three to four longline vessels are now 30 to 40. Another supplier opened his business specifically because of the economic opportunity associated with the export of longline gear. The Atlantic coast of the U.S. is only 30 percent of his business. He does not see Americans investing in new fixed equipment but people are still replacing equipment when necessary. He describes the Atlantic coast U.S. longline fleet as currently the least technically sophisticated of all the fleets he supplies.

Community Impacts in Pompano Beach, Florida

Accounting for dead discards in swordfish management could result in an estimated 13 percent decrease in total revenues in the swordfish fishery, beginning in 2000. This estimate is based on the weight of 1997 dead discards relative to 1997 total mortality in the U.S. north Atlantic swordfish fishery. This measure may also affect the timing of closures of the directed fishery. If the United States can negotiate a ten-year ICCAT rebuilding program for swordfish, it could result in a 27-percent decrease in TAC for the United States; negative impacts to revenues that are associated with this action would be large. Some vessels that rely heavily on swordfish revenues would be forced to shift some effort to other fisheries or exit fishing altogether. Displaced effort would depend on region and type of gear; some may shift effort to longlining for dolphin fish, wahoo, and BAYS; snapper-grouper fishery (although there is limited access).

The requirement to have VMS onboard every pelagic longline vessel fishing for HMS will involve a substantial one-time cost ($1800 for unit plus $100 for installation) for the pelagic longline community in Pompano Beach, but this measure is necessary to implement time/area closures effectively. Together, the measures in the swordfish rebuilding plan and the VMS requirement are likely to have some social impacts on the pelagic longline community of Pompano Beach, but NMFS maintains that these actions are necessary to rebuild the swordfish fishery.

Expanding the list of prohibited shark species to include dusky sharks may have some social impacts for the longline fishery because dusky sharks are targeted as a marketable species. The minimum size for ridgeback sharks may substantially change the way in which the large coastal shark fishery operates by pushing fishermen further offshore to target adult fish, possibly increasing the number of days per trip and increasing the cost of fishing.

Reducing the non-ridgeback large coastal sharks may have substantial social impacts on the pelagic longline fishery because blacktip sharks, the primary non-ridgeback species, are frequently caught and landed in this fishery. Some fishermen have already left the fishery as a result of the 50 percent large coastal shark quota cut in 1997. Counting dead discards and landings in state waters after Federal closures against the Federal shark quota will likely have substantial social impacts by reducing the available quotas and the already short Federal shark seasons are likely to become even shorter. Although commercial fishing for sharks is already prohibited in the state waters of Florida, coastwide landings of large coastal sharks and unclassified sharks in state waters after Federal closures are large enough that, in combination with counting dead discards against the quota, Federal waters may not even open. This action may put some fishermen out of business, shorten the fishing season, cause market gluts, and lower ex-vessel prices. It may also increase variable costs and decrease gross revenues by pushing fishermen out of waters where sharks are abundant and into waters where target species are also less abundant. The cap on the commercial quota for small coastal sharks will limit opportunities for fishermen to expand their current operations to target small coastal sharks as an alternative to large coastal sharks. Additionally, the 100-percent observer coverage requirement in the gillnet fishery and prohibition of the use of gillnet gear without an observer may reduce revenues for these vessels if an observer is not available.

The final management measures for sharks may have substantial impacts for those longline fishermen in Pompano Beach who depend on shark fishing and may force captains and crew to pursue jobs in the recreational and charter fisheries. However, the final actions to announce fishery seasons ahead of time and establish season-specific quotas may minimize these impacts and increase the stability and predictability of shark fisheries, particularly large coastal sharks fisheries. Finally, NMFS maintains that the impacts have been minimized to the extent practicable and that final actions are necessary to rebuild large coastal sharks and prevent overfishing of pelagic and small coastal sharks, consistent with Magnuson-Stevens Act requirements.

The limited access system implemented by this FMP may have minor social impacts on the pelagic longline fishery in Pompano Beach; however, this system removes latent effort only and issues directed and incidental permits based on historical and current fishery participation. Thus, fishermen active in the pelagic longline fishery are generally supportive of this measure. Directed permits will allow fishermen to operate under the quotas, seasons, and commercial retention limits established under this FMP. Lower retention limits for incidental permit holders should allow fishermen to continue to land fish in quantities similar to current levels. Transferability of permits also allows fishermen flexibility in business planning. Overall, NMFS maintains that the measures in this FMP provide for the sustained participation in the fishing communities of Pompano Beach, within the constraints of the resource. The agency has selected the final actions which minimize adverse social and economic impacts, to the extent practicable, while rebuilding overfished fisheries as required by the Magnuson-Stevens Act.

9.6.3 Madeira Beach

Madeira Beach is part of the Tampa Bay urban complex, one of several beach suburbs of St. Petersburg. The area is the central port for the Florida shark bottom longline fleet. Madeira Beach is also home to a thriving recreational HMS fishery. In terms of revenue, tourism is the number one industry in Pinellas County. Annually, four million visitors contribute about two billion dollars to the economy. The tourism industry also employs almost 60,000 of the residents either directly or indirectly, adding up to $720 million in wages (St. Petersburg/Clearwater Visitors Bureau brochure, 1998).

Demographic Profile of Madeira Beach (Source: U.S. Bureau of the Census, 1990)

Population: 4,225; population estimate for 1996 is 4,383.

Racial and Ethnic Composition: 99.8 percent Caucasian. The highest group of single ancestry in the ethnic composition of Madeira Beach consists of people of German ancestry (11 percent).

Age Structure: 39 percent aged 15-44; seven percent under age 15; 54 percent over age 44.

Marriage: 55 percent married; 20 percent never-married; 12 percent widowed; and 13 percent divorced.

Household Composition: 2,230 households; average of 1.88 persons per household.

Education Trends: Nearly 84 percent of residents 25 years and older graduated high school.

Employment: Unemployment rate is 2.8 percent of the civilian labor force; state average 5.8 percent. Of the residents 16 years and older, nearly 59 percent participate in the work force. The most dominant industries in terms of employment are retail trade (30.7 percent of employees 16 years and older), professional and related services (20.9 percent), and construction (8.8 percent). Agriculture, forestry, and fisheries industries account for less than two percent of employment in Madeira Beach.

Per Capita Income (1989): $17,301, considerably higher than the per capita income for Panama City ($12,169); state average $14,698.

Fishing Organizations: Madeira Beach fishermen are represented by the Southern Offshore Fisherman's Association (SOFA) which has been heavily involved in shark management issues. This organization once had 1,000 members, but now is down to 40 reef fish and shark fishing vessels.

The Pelagic Longline Fishery

The offshore fishing industry in Madeira Beach started as a bandit (reel fixed to transom) fishery before it shifted to bottom longlining. Grouper is the traditional fishery for the community. In the 1960s, there were two dealers supported by charterboats selling fish

and a small commercial fleet targeting kingfish and grouper. Many species which are now sold, such as amberjack, were considered junk fish. As demand for seafood began to grow, higher prices accompanied by investment programs lead to substantial investment in commercial fishing within this community.

Pelagic longline vessels began to target swordfish in the 1970s, using cloth and nylon line before monofilament longlining became widely used. Local availability of swordfish declined quickly and a group of vessels went north to look for fish. On their way back they set longline gear in deep water and caught a significant amount of tilefish and yellow edge grouper; this was how the bottom longline fishery in Madeira Beach began (Wilson *et al.*, 1998). Marginal swordfish vessels began to experiment with various techniques such as straight hooks, auto-baiters and circle hooks. These vessels were now too small to be successful at swordfishing because of the increased steaming distances required. The fleet at Madeira Beach is currently 95 percent longline vessels. There are four seafood dealers in this community, two of which buy and sell pelagic fish. One dealer estimated that before restrictions on shark fishing his business used to be 45 percent grouper, 45 percent shark, and ten percent swordfish and tuna; now it is 75 percent grouper, ten percent shark and 15 percent swordfish and tuna.

Many longline fishermen have multiple permits and a substantial number are grouper fishing. Different gear is used for the different fisheries. Grouper fishing requires a wire cable while the pelagics use mono-filament, although some fishermen fish grouper with a monofilament mainline using weights to sink it. The maximum number of trips they can make is about 15 trips a year, as a grouper trip lasts 18 to 20 days. Mexican grouper fishing has created a lot of competition in the last decade, and U.S. fishermen are upset by the ineffectiveness of Mexican regulations and the lack of import controls. In the United States, grouper are subject to limited access, a minimum size, area restrictions, and a quota.

Yellowfin tuna is an important Gulf of Mexico fishery, but it requires a different kind of gear from that used in the grouper and shark fisheries, as well as a larger vessel because of steaming distances. Currently, few vessels land tunas in Madeira Beach and their catches are low. Yellowfin meat has to be kept at a high quality as it is sold for steak. A good trip can yield 30,000 pounds of yellowfin tuna. Florida fishermen prefer tuna fishing to grouper fishing because of the shorter hours and better prices.

Overall, the Madeira Beach longliners are becoming fewer and more isolated from the rest of the fishing community (Wilson *et al*., 1998). Respondents say that antagonism and competition among dealers has gotten worse in recent years as vessels drop out of fishing, often being sold outside of the country. Many of these crews are living trip to trip and often need credit for engine repair, ice, fuel and even household and personal items. Both the fishermen and an engine supplier reported that the commercial fleet is spending more on maintaining existing gear and vessels rather than buying new equipment. Traditional patterns of dealers building relationships by extending services and credit to vessels are giving way to price-based competition to gain access to vessels.

Fishermen in this community have experienced restrictions on gear, harvest, and capacity in many of its important fisheries. Researchers found that alternative employment outside of the fishery is available through expanding opportunities in the tourism and recreational fishing industries. However, researchers found that this relatively ready supply of alternative employment threatened the stability of the labor pool for the fishing industry. Some reported that the best captains are leaving the country or moving on to other jobs. Like many other fishing communities, the longline fleet in Madeira Beach is experiencing market competition from imports of their target species. Concerns cited by pelagic longline fishermen were the safety of small vessels during winter openings, and the prospect of small vessels having to pay for observers and VMS (Wilson *et al*., 1998).

The Shark Bottom Longline Fishery

When this fishery began, it was easy to catch sharks, but the bottom longline fishery has become marginal because of restrictions and the increased distances the fishermen now have to steam (Wilson *et al*., 1998). Shark meat is currently worth only $0.50 to $0.60 per pound. Members of the fishing and supply industries reported price fluctuations in the shark fishery, which they attributed to the difficulty in maintaining steady supplies under derby-style quota management. The fins bring the most money and are exported to Asian nations. Shark trips have to be kept as short as possible to maintain good quality meat. Respondents suggest that regulations, particularly the 4,000-pound shark commercial retention limit, have turned the fishery into a small vessel fishery. Even vessels measuring as small as 50 feet in length can have difficulty making a profit (Wilson *et al*., 1998). Some fishermen keep both grouper and shark gear on board.

Researchers questioned fishery participants about the possibility of implementing a minimum size for sharks. The Florida bottom longline fleet targets sandbar sharks for their valuable fins. Fishermen in this community are opposed to these limits; they estimate that a 58-inch size limit would reduce their catch by 40 to 50 percent (Wilson *et al*., 1998). The bottom longline fleet is mainly concerned with avoiding disturbances in the supply of sharks. Researchers concluded that the overall effect of increased restrictions on the bottom longline fleet would be redirected fishing effort on grouper and yellowfin tuna, increased difficulty in finding and retaining employees, and an acceleration in the rate at which the fleet's vessels and experienced fishermen are moving overseas, especially to Mexico. Researchers also concluded that increased restrictions on commercial fishing would accelerate the decline of that sector relative to the recreational fishery in Florida, particularly in Madeira Beach.

The Recreational Shark Fishery

Approximately 50 to 60 private vessels participate in the recreational fisheries of Madeira Beach, and more than 48,000 pleasure vessels are registered in Pinellas County (Florida Bureau of Vessel Titling and Registration, 1996 and 1997). Researchers found tension and distance between the recreational and commercial fishing communities to be high, and recreational fishermen tend to maintain that commercial fishing is to blame for the declining shark populations (Wilson *et al*., 1998). Shark fishing is comparatively less

important to recreational fishing in Madeira Beach than other HMS, although researchers reported that the local recreational shark fisheries are very healthy.

There were shark tournaments in Madeira Beach in the past, mostly sponsored by a vessel or engine manufacturer, but they are no longer held. Stores sell very little shark tackle, but one respondent maintains the industry is beginning to come back. The miles-long remainder of the old Sunshine Skyway bridge is now used as a pier for recreational shark fishing. One respondent estimated that recreational shark fishing in this community is 90 percent catch and release. Recreational fishermen expressed mixed feelings towards a proposal to require recreational permits for all HMS. Some objected to the idea of paying money for a recreational permit, while others expressed their willingness to do whatever it takes to rebuild the stocks.

Community Impacts in Madeira Beach, Florida

Accounting for dead discards in swordfish management could result in an estimated 13-percent decrease in total revenues in the swordfish fishery, beginning in 2000. This estimate is based on the weight of 1997 dead discards relative to 1997 total mortality in the U.S. north Atlantic swordfish fishery. This measure may also affect the timing of closures of the directed fishery. If ICCAT adopts an international ten-year rebuilding program for north Atlantic swordfish, it could result in a 27-percent decrease in TAC for the United States. Negative impacts to revenues that are associated with this action would be large, although longline vessels that fish the Gulf of Mexico tend to rely more on yellowfin tuna than on swordfish. Some vessels that rely heavily on swordfish revenues would be forced to shift some effort to other fisheries or exit fishing altogether. Displaced effort would depend on region and type of gear; some may shift effort to longlining for dolphin fish, wahoo, and BAYS tunas; snapper-grouper fishery (although there is limited access); mackerel, squid and butterfish fisheries.

The requirement to have VMS onboard every pelagic longline vessel fishing for HMS will involve a substantial one-time cost ($1800 for unit plus $100 for installation) for the pelagic longline community in Madeira Beach, but this measure is necessary to implement time/area closures effectively. Together, the measures in the swordfish rebuilding plan and the VMS requirement are likely to have some social impacts on the pelagic longline community of Madeira Beach, but NMFS maintains that these actions are necessary to rebuild the swordfish fishery.

The limited access system implemented by this FMP may have minor social impacts on the pelagic and shark bottom longline fisheries in Madeira Beach; however, this system removes latent effort only and issues directed and incidental permits based on historical and current fishery participation. Directed permits will allow fishermen to operate under the quotas, seasons, and commercial retention limits established under this FMP. Lower retention limits for incidental permit holders should allow fishermen to continue to land fish in quantities similar to current levels. Transferability of permits also allows fishermen flexibility in business planning.

The minimum size for ridgeback sharks may substantially change the way in which the large coastal shark fishery operates, especially since observer data indicate that some fishermen have increasingly targeted juvenile and subadult sandbar and dusky sharks in recent years. It will force fishermen further offshore to target adult fish, possibly increasing the number of days per trip and increasing the cost of fishing. Some fishermen have already left the fishery as a result of the 50-percent quota reduction for large coastal sharks in 1997. This measure may result in severe economic effects in the short term with a permanent loss of fishermen and community infrastructure in Madeira Beach. Reducing the non-ridgeback large coastal shark quota is likely to have substantial social impacts on the shark bottom longline fishery in Madeira Beach because blacktip sharks, the primary non-ridgeback species, are a dominant species in this fishery. The cap on the commercial quota for small coastal sharks will limit opportunities for fishermen to expand their current operations to target small coastal sharks as an alternative to large coastal sharks.

Counting dead discards and landings in state waters after Federal closures against the Federal shark quota will likely have substantial social impacts by reducing the available quotas. Currently, many states continue to allow their fishermen to land large coastal sharks after a Federal closure. When these landings are counted against the next year's Federal quota, the already short Federal shark seasons are likely to become even shorter. Although Florida state waters do not have a commercial fishery for sharks, landings of large coastal sharks and unclassified sharks in other states' waters after Federal closures are large enough that, in combination with counting dead discards against the quota, Federal waters may not even open. This measure may put some fishermen out of business in Madeira Beach, shorten the fishing season, cause market gluts, and lower ex-vessel prices. It may also increase variable costs and decrease gross revenues by pushing fishermen out of waters where sharks are abundant and into waters where target species are also less abundant.

The final action prohibiting dusky sharks will also have adverse social impacts in Madeira Beach, particularly for those fishermen that have increasingly targeted dusky sharks in recent years. This measure will likely reduce revenues, perhaps substantially for some fishermen, because dusky sharks are preferentially retained in commercial fisheries, although they accounted for only two percent of large coastal shark commercial landings in 1997. The other species that are included in the new prohibited species management unit are unlikely to have any social impacts on the shark bottom longline fishery because most fishermen do not harvest these species.

Scheduling shark fishery openings for specified periods may somewhat mitigate the negative social effects of the quota reductions. This measure is likely to increase the predictability of the large coastal shark fishery by eliminating the uncertainty of fishery closures and allowing more advance planning of fishing trips. It will also improve the ability of shark dealers and retailers to make long term plans for marketing and advertising. Scheduled openings may reduce derby conditions and decrease the potential for market gluts, thereby increasing revenues. Season-specific quotas and adjustments for the commercial shark fisheries may have a small negative economic impact for commercial fishermen who fish in the first season and a small positive impact for those who fish primarily in the second season. As Madeira Beach shark fishermen participate in both the first and second seasons,

season-specific quotas may not reduce revenues but may increase fishing opportunities in the second season.

Together, the measures under the large coastal shark rebuilding program are likely to have significant negative social impacts in the shark bottom longline fishery of Madeira Beach. The final actions that implement a ridgeback large coastal shark minimum size and establish season-specific quota adjustments may substantially alter the way the fishery operates. The final actions to prohibit possession of dusky sharks, reduce the non-ridgeback large coastal shark quota, and account for all sources of mortality may essentially preclude the Federal large coastal shark fisheries from opening at all. The final actions implementing limited access and capping the small coastal shark quota may also limit the opportunities of Madeira Beach fishermen to expand fishing into state waters or other fisheries.

While these actions are likely to have substantial negative social impacts, NMFS maintains that the final action to announce the fishery seasons ahead of time may minimize the negative impacts to a limited degree. Nevertheless, NMFS is aware that the cumulative impacts of the shark measures in this FMP may put some fishermen out of business and result in a permanent loss of community infrastructure in Madeira Beach. NMFS implements these final measures despite the magnitude of the negative impacts on some communities, including the shark bottom longline community in Madeira Beach, in order to rebuild large coastal sharks and prevent overfishing of pelagic and small coastal sharks and provide for the sustained participation of all communities, consistent with Magnuson-Stevens Act requirements. In the long term, these actions will shorten the time it takes to rebuild these fisheries. An economically viable shark fishery, without market gluts and short seasons will have long-term benefits for fishing communities.

The final action to prohibit possession of dusky sharks will also likely have adverse social impacts in the shark recreational fishery, because dusky sharks are frequently targeted as a large game fish. Establishing a minimum size of 4.5 feet in the recreational fishery may have substantial social impacts in Madeira Beach because many sharks harvested in this fishery are smaller than this minimum size, especially in nearshore waters. This action may essentially establish a catch and release fishery for sharks in near-shore waters. Social impacts for offshore anglers will be minor because most sharks harvested offshore are larger than this minimum size. Reducing the recreational retention limit will likely have substantial social impacts by limiting charterboat and tournament operations that want to retain their shark catches; however, researchers have noted an increasing catch-and-release ethic among anglers which may mitigate these negative impacts. The final action to establish an allowance of one Atlantic sharpnose shark per person per trip should also minimize social impacts. Additionally, anglers may be willing to pay more for the opportunity to catch larger sharks once the stocks rebuild, bringing positive social impacts to the recreational shark fishing community of Madeira Beach in the long term. The final actions to implement a minimum size for all sharks and to reduce the recreational retention limit may have substantial impacts on the Madeira Beach recreational shark fishery although the allowance of one Atlantic sharpnose shark per person should mitigate these impacts. NMFS maintains that the final actions minimize the social impacts to the extent practicable while still meeting conservation goals.

The requirement for charter/headboat vessels to obtain a permit and submit logbooks will have an economic impact for vessels that do not already have a Charter/Headboat permit for tunas. The charter vessel owner will be charged a fee for the vessel permit (probably $20 to $40) to cover administrative costs. The logbook will cost the charter captain time to fill out and send to the appropriate NMFS office. However, public comment at scoping meetings and at HMS AP meetings indicated significant support for this alternative among charter/headboat captains. Many captains already fill out such logbooks and many view faxing their report to NMFS a small burden when weighed against the benefit of supporting more effective HMS management. Tournament registration for all HMS will impose an additional reporting burden on shark and tuna tournament operators, who are not currently reporting on billfish tournament forms. These measures are not likely to have large social impacts on the recreational fishing community in Madeira Beach.

Overall, the measures in this FMP are designed to minimize economic impacts, to the extent practicable, and provide for the sustained participation in fishing communities like those of Madeira Beach. However, the management actions must also ensure rebuilding of overfished fisheries, consistent with the conservation requirements of the Magnuson- Stevens Act.

9.6.4 Panama City

Panama City is one of the Florida Panhandle's top fishing centers. It offers surf fishing, pier fishing, and charter/headboat fishing, according to the Panama City Tour Guide. According to the Florida Bureau of Vessel Titling and Registration, the county has a total of 16,865 registered vessels with 15,359 pleasure and 1,433 commercial vessels. Headboats are an important part of Panama City's tourism. People enjoy bringing children along since these trips are shorter than charterboat trips. Panama City is a summer resort, with little tourist activity in the winter, as well as an important commercial fishing port.

During the winter, fishermen target bottom fish and bluefish. In March, the season begins for Spanish mackerel, cobia, snapper, bonito, little tunny, amberjack, snapper, red porgies, rudder fish, blue runner, bluefish, and redfish. By summer, they also fish for king mackerel, dolphin fish, wahoo, little tunny, and barracuda. White marlin, blue marlin and sailfish are caught in late summer. Some charterboats will go shark fishing at night for extra income. In September, the fishery is very mixed, and in October, king mackerel and bonito are popular. Tourists are mainly interested in bottom fishing. Motivations have changed; people used to be interested in catching a lot of fish and taking it home to eat or sell, but now people are satisfied to catch anything (Wilson *et al*., 1998).

Demographic Profile of Panama City (Source: U.S. Bureau of the Census, 1990)

Population: 34,378; population estimates for 1993 and 1996 are 35,650 and 35,986 residents, respectively.

Racial and Ethnic Composition: 76 percent Caucasian; 21 percent African-American. The highest occurrence of a single ancestry group is those of Hispanic origin (25 percent).

Age Structure: 43 percent aged 15-44; 37 percent above age 44; 20 percent under age 15.

Marriage: 55 percent married; 23 percent never-married; 12 percent divorced; and ten percent widowed. Of those widowed, 15 percent were male and 85 percent were female.

Household Composition: 14,033 households; average of 2.38 persons per household.

Educational Trends: Approximately 70 percent of the population 25 years and older graduated from high school.

Per Capita Income: $12,169 in 1989; this is considerably lower than the per capita income of Madeira Beach ($17,301); state average $14,698.

Employment: Unemployment rate is 8.1 percent of the civilian labor force; state average is 5.8 percent. Approximately 57 percent of the population 16 years and older participates in the civilian labor force. The dominant employment industries in Panama City are professional and related services (25.2 percent), retail trade (21.4 percent), public administration (7.9 percent), the manufacturing industry (eight percent) and construction (seven percent). Agriculture, forestry and fisheries industries employ 1.5 percent of those working in Panama City.

Fishing Organizations: Some Panama City longliners are members of Blue Water Fishermen's Association.

The Pelagic Longline Fishery

In the early 1980s, yellowfin tuna was the main fishery for Panama City from April through December while bluefin tuna were targeted in the winter. Panama City vessels sold bluefin tuna at regular auctions in Dulac, Venice, and Galveston during the early 1990s. They had a quota of 110 tons and they could bring in two fish per day in trips that lasted four to five days; prices averaged $20 per pound during these peak years. This fishery was considerably reduced by the incidental catch requirement to land 2,500 pounds of target catch in order to take a bluefin tuna. Fishermen say they cannot meet the target catch requirement when the yellowfin season is slow and that therefore discarding of bluefin and high grading have become a problem. Some of the longline vessels are shifting from yellowfin tuna fishing to grouper fishing, since the latter requires fewer crew members.

Panama City now has nine offshore pelagic longline vessels that target yellowfin tuna during most of the year, and one distant water swordfish longline vessel (Wilson *et al*., 1998). Some of these vessels will target dolphin fish in the summer, and swordfish more rarely. Two of these vessels are owner operated, two are owned by a dealer, three are each owned by a single person who hires a captain, and two others are owned by the same person who hires captains. Some pelagic longline fishermen also participate in the reef fish fishery. There are 16 to 19 grouper vessels operating out of Panama City. One fish trader interviewed by the researchers reported that his current business is 87 percent yellowfin tuna and eight percent snapper, with the remainder being a mix of swordfish, bluefin tuna, dolphin, wahoo, and escolar. He buys from about ten vessels now but bought from 30 vessels a few years ago. Dealers have expressed concern that yellowfin tuna caught by Mexican fishermen and imported is not being marked as a product of Mexico. Many of the larger U.S. vessels have gone to Mexico, where fishing regulations are more lenient and it is easier to find crew members.

While Panama City is developing tourist and recreational fishing industries, the longline fishermen are becoming fewer and more isolated from the rest of the fishing community. The competition among dealers is perceived as becoming more aggressive. Traditional patterns of dealers building relationships by extending services and credit to vessels are giving way to price-based competition to gain access to vessels. Fishermen in this community have experienced restrictions on gear, harvest, and capacity in many important fisheries. Researchers found that alternative employment outside of the fishery is available in the developing tourism and recreational fishing industries. However, researchers concluded that this relatively ready supply of alternative employment threatened the stability of the labor pool for the fishing industry (Wilson *et al*., 1998).

The Shark Bottom Longline Fishery

Some of the pelagic longline vessels in Panama City switch their gear to target sharks when the shark fishery is open. The Florida bottom longline fleet primarily targets sandbar sharks for their valuable fins. Researchers questioned fishermen about the possibility of implementing a minimum size for sharks. Fishermen in this community estimate that a 58-inch size limit would reduce their catch by 40 to 50 percent. The main desire in the shark

fleet appeared to be avoiding disturbances in supply. Members of the fishing and supply industries reported price fluctuations in the shark fishery, which they attributed to the difficulty in maintaining steady supplies under derby-style quota management. Other concerns cited were safety of small vessels during winter openings, and the prospect of small vessels having to pay for observers and VMS.

Researchers concluded that the overall effect of increased restrictions on the bottom longline fleet would be increased pressure on grouper and yellowfin tuna, increased difficulty in finding and retaining employees, and an acceleration in the rate at which the fleet's vessels and experienced fishermen are moving overseas, especially to Mexico. Increased restrictions on commercial fishing would likely accelerate the decline of that sector relative to the recreational fishery in Florida (Wilson *et al*, 1998).

The Recreational Shark Fishery

Shark fishing is comparatively less important to recreational fishing in Panama City than billfish, although some customers are attracted by shark in particular. Researchers reported that the recreational shark fisheries of Panama City are very healthy. They found that tension and distance between the recreational and commercial fishing communities in Panama City are high. Recreational fishermen throughout this area tend to believe that commercial fishing is to blame for the declining shark populations (Wilson *et al*., 1998).

An annual shark tournament was held in Panama City from 1980 to 1996. The change that the fishery experienced in that time was dramatic and the organizers felt that the recreational fishery was wasting a lot of fish given the condition of the resource (Wilson *et al*., 1998). This tournament used to draw people from a couple of hundred miles away. One tackle store owner related that only five to ten percent of his business is now shark related, whereas it used to be close to 80 percent. The increased popularity of catch and release fishing has actually increased tackle sales because a large, offshore private vessel will keep two sets of tackle on board. Recreational fisherman are concerned about the complexity of the management measures for sharks, which vary by species. Those interviewed estimated that the 58-inch minimum size proposed for sandbar sharks would lead to discards of about half of the catch (Wilson *et al*., 1998).

Community Impacts in Panama City, Florida

Accounting for dead discards in swordfish management could result in an estimated 13-percent decrease in total revenues in the swordfish fishery, beginning in 2000. This estimate is based on the weight of 1997 dead discards relative to 1997 total mortality in the U.S. north Atlantic swordfish fishery. This measure may also affect the timing of closures of the directed fishery. If ICCAT adopts an international ten-year rebuilding program for north Atlantic swordfish, it could result in a 27-percent decrease in TAC for the United States. Negative impacts to revenues that are associated with this action would be large, although longline vessels that fish the Gulf of Mexico tend to rely more on yellowfin tuna than on swordfish. Some vessels that rely heavily on swordfish revenues would be forced to shift some effort to other fisheries or exit fishing altogether. Displaced effort

would depend on region and type of gear; some may shift effort to longlining for dolphin, wahoo, and BAYS or to the snapper-grouper fishery (although there is limited access).

The requirement to have VMS onboard every pelagic longline vessel fishing for HMS will involve a substantial one-time cost ($1800 for unit plus $100 for installation) for the pelagic longline community in Panama City, but this measure is necessary to implement time/area closures effectively. Together, the measures in the swordfish rebuilding plan and the VMS requirement are likely to have some social impacts on the pelagic longline community of Panama City, but NMFS maintains that these actions are necessary to rebuild the swordfish fishery. The ICCAT Rebuilding Program for bluefin tuna will not have any social impacts on the pelagic longline fishing community in Panama City, since the Rebuilding Program does not call for decreased quotas, the FMP maintains status quo allocation patterns and pelagic longline vessels are prohibited from targeting bluefin tuna.

The limited access system implemented by this FMP may have minor social impacts on the pelagic and shark bottom longline fisheries in Panama City; however, this system removes latent effort only and issues directed and incidental permits based on historical and current fishery participation. Directed permits will allow fishermen to operate under the quotas, seasons, and commercial retention limits established under this FMP. Lower retention limits for incidental permit holders should allow fishermen to continue to land fish in quantities similar to current levels. Transferability of permits also allows fishermen flexibility in business planning.

The minimum size for ridgeback sharks may substantially change the way in which the large coastal shark fishery operates by pushing fishermen farther offshore to target adult fish and possibly increasing the number of days per trip and increasing the cost of fishing. Reducing the non-ridgeback large coastal shark quota is likely to have substantial social impacts on the shark bottom longline fishery in Panama City because blacktip sharks, the primary non-ridgeback species, are a dominant species in this fishery. This measure may result in severe economic effects in the short term because additional reductions in the allowable blacktip quota may result in those fishermen that were marginal after the 1997 reductions to cease operations. The cap on the commercial quota for small coastal sharks will limit opportunities for fishermen to expand their current operations to target small coastal sharks as an alternative to large coastal sharks.

Counting dead discards and landings in state waters after Federal closures against the Federal shark quota will likely have substantial social impacts by reducing the available quotas and the already short Federal shark seasons are likely to become even shorter or preclude Federal waters from opening. This measure may create further incentive for them to cancel their Federal shark permits although the implementation of limited access should reduce that incentive. This action may put some fishermen out of business in Panama City, shorten the fishing season, cause market gluts, and lower ex-vessel prices. It may also increase variable costs and decrease gross revenues by pushing fishermen out of waters where sharks are abundant and into waters where target species are also less abundant.

Together, the measures under the large coastal shark rebuilding program are likely to have substantial negative social impacts in the shark bottom longline fishery in Panama City. The final actions that implement a ridgeback large coastal shark minimum size and establish season-specific quota adjustments may substantially alter the way the fishery operates. The final actions to prohibit possession of dusky sharks, reduce the non-ridgeback large coastal shark quota, and account for all sources of mortality may essentially preclude the Federal large coastal shark fisheries from opening at all. The final actions implementing limited access and capping the small coastal shark quota may also limit the opportunities of Panama City fishermen to expand fishing into state waters or other fisheries.

Although the final action prohibiting dusky sharks may have adverse social impacts, the impacts of this action may be less in Panama City than other communities because dusky sharks are less common in northern Gulf of Mexico. The other species included in the prohibited species management unit are unlikely to have any social impacts on the shark bottom longline fishery because most fishermen do not harvest these species.

While these actions are likely to have substantial negative social impacts, scheduling shark fishery openings for specified periods and establishing season-specific quotas may somewhat mitigate the negative social effects of the quota reductions. This measure is likely to increase the predictability of the large coastal shark fishery by eliminating the uncertainty of fishery closures and allowing more advance planning of fishing trips. It will also improve the ability of shark dealers and retailers to make long term plans for marketing and advertising. As Panama City shark fishermen participate in both the first and second seasons, season-specific quotas may not reduce revenues but may increase fishing opportunities in the second season.

Nevertheless, NMFS is aware that the cumulative impacts of the shark measures in this FMP may put some fishermen out of business and result in a permanent loss of community infrastructure in Panama City. NMFS implements these final measures despite the magnitude of the negative impacts on some communities, including the shark bottom longline community in Panama City, in order to rebuild large coastal sharks and prevent overfishing of pelagic and small coastal sharks and provide for the sustained participation of all communities, consistent with Magnuson-Stevens Act requirements. In the long term, these actions will shorten the time it takes to rebuild these fisheries. An economically viable shark fishery, without market gluts and short seasons will have long-term benefits for fishing communities.

The final action to establish a minimum size of 4.5 feet in the recreational fishery will likely have substantial social impacts in Panama City because many sharks harvested in this fishery are smaller than this minimum size, particularly in nearshore waters. This action may essentially establish a catch and release fishery for sharks in near-shore waters. Social impacts for offshore anglers will be minor because most sharks harvested offshore are larger than this minimum size. Reducing the recreational retention limit will likely have substantial social impacts by limiting charterboat and tournament operations that want to retain their shark catches; however, researchers have noted an increasing catch-and-release ethic among anglers which may mitigate these negative impacts. The final action to establish an allowance

of one Atlantic sharpnose shark per person per trip should also minimize social impacts considerably. Additionally, anglers may be willing to pay more for the opportunity to catch larger sharks once the stocks rebuild, bringing positive social impacts to the recreational shark fishing community of Panama City in the long term. Overall, the final actions to implement a minimum size for all sharks and to reduce the recreational retention limit may have substantial impacts on the Panama City recreational shark fishery although the allowance of one Atlantic sharpnose shark per person should mitigate these impacts. NMFS maintains that the final actions are necessary to rebuild large coastal sharks and prevent overfishing of small coastal sharks; the measures are designed to minimize social impacts while allowing for limited harvest of sharks.

The requirement for charter/headboat vessels to obtain a permit and submit logbooks will have an economic impact for vessels that do not already have a Charter/Headboat permit for tunas. The charter vessel owner will be charged a fee for the vessel permit (probably $20 to $40) to cover administrative costs. The logbook will cost the charter captain time to fill out and send to the appropriate NMFS office. However, public comment at scoping meetings and at HMS AP meetings indicated significant support for this alternative among charter/headboat captains. Many captains already fill out such logbooks and see faxing their report to NMFS as a small burden when weighed against the benefit of supporting more effective HMS management. Tournament registration for all HMS will impose an additional reporting burden on those shark and tuna tournament operators who are not currently reporting on billfish tournament forms. Overall, these measures are not likely to have large social impacts on the recreational fishing community in Panama City.

9.7 Louisiana Community Profiles

Demographic Profile of Louisiana (Source: U.S. Bureau of the Census, 1990)

Population: 4,219,973

Education: 68 percent of residents 25 years and older graduated from high school

Employment: 9.6 percent of the civilian labor force is unemployed. Retail accounts for 17 percent of employment in the state, followed by health services (nine percent); and educational services (ten percent). Agriculture, forestry, and fisheries account for three percent of employment in Louisiana.

Per capita income (1989): $10,635

In 1996, commercial bluefin tuna landings in Louisiana were approximately 41,000 pounds, accounting for approximately two percent of commercial bluefin tuna landings in the Atlantic and Gulf states. The ex-vessel gross revenues of these landings were approximately $174,000, or one percent of the total for the Atlantic and Gulf states (NMFS). Swordfish landings totaled nearly 770,000 pounds, accounting for 16 percent of the total swordfish landings in the Atlantic and Gulf states. The ex-vessel gross revenues of these landings were approximately $1.9 million, or 12 percent of the economic value of swordfish landings in the Atlantic and Gulf states (NMFS).

Large coastal shark landings totaled approximately 1,375,000 pounds, with a ex-vessel gross revenues of $1.9 million (NMFS).

In the recreational fishery, expenditures by Louisiana saltwater anglers were approximately $205 million, accounting for nearly 2.5 percent of the total U.S. expenditures by saltwater anglers. Saltwater fishing in Louisiana had an economic impact of approximately $395 million (about 1.6 percent of the U.S. total), generated wages and salaries of $105 million, and created approximately 5,600 jobs (ASA, 1997). The percentage of those totals may be attributed to HMS fisheries is unknown.

The communities in Louisiana that may be affected by this Fishery Management Plan include: Cameron, Cut Off, Dulac, Grand Isle, Houma, Larose, Leeville, New Orleans, Port Fourchon, and Venice (Tables 9.13, 9.14).

Table 9.13 Fisheries characteristics of Louisiana communities affected by the HMS FMP. (NMFS, 1997)

Community	Bluefin Tuna Landings *dressed weight in metric tons (mt)*	Bluefin Tuna Landings *rank*	Commercial Tuna Permits *number*	Commercial Tuna Permits *rank*	Recreational Tuna Permits *number*	Recreational Tuna Permits *rank*	Swordfish Landings *# of fish*	Swordfish Landings *rank*	LC Shark Landings *# of fish*	LC Shark Landings *rank*
Cameron	0.3	4			2					
Cut Off			1				416	3		
Larose							219	4		
Dulac	9.4	1	5	6	1		526	2	483	2
Houma			6	4	18	4	181	5		
Grand Isle			13	3	51	3				
New Orleans			20	2	66	2	3,735	1	1,696	1
Venice	4.4	2	23	1	204	1	54	8		

Table 9.14 Demographic characteristics of Louisiana communities affected by the HMS FMP. (U.S. Bureau of the Census, 1990)

Community	1990 Census Population	Sex Ratio M/F	% Married Family Households	% of High School Graduates Age 25 and over	Civil Unemployment Rate	1989 Per Capita Income	% Agriculture, Forestry & Fisheries Industry
Cameron	2,041	0.97	65.4	46.6	9.6	$8,654	11.0
Cut Off	5,325	0.95	76.2	54.6	6.9	$8,548	5.0
Larose	5,772	0.99	67.7	53.8	7.7	$8,251	4.9
Dulac	3,273	0.97	68.3	27.1	17.5	$4,946	19.6
Houma	30,495	0.90	53.8	62.6	8.4	$9,790	1.5
Grand Isle	1,455	0.96	59.1	57.0	7.4	$9,571	5.4
New Orleans	496,938	0.87	35.6	68.1	12.7	$11,372	0.8
Venice	2,743	1.06	72.6	43.5	6.4	$6,949	14.5

9.7.1 Dulac

Dulac is located in the center of Terrebonne Parish, about 15 miles south of Houma, LA. Houma lies at the intersection of the Houma Navigational Canal and the Intercoastal Waterway and serves as the parish seat and a locale of employment opportunities in offshore equipment building for Dulac residents. Terrebonne Parish government is a consolidated government so most data are gathered on a parish-wide basis.

According to the Terrebonne Parish Planning Department, the parish has not spent much time tracking the importance of the commercial fishing industry, but anecdotal evidence suggests that it is a long-standing and significant part of the community economy. Landings of tunas, swordfish, and sharks indicate that Dulac is among the most important fishing ports in the state. However, many of the fishermen who target highly migratory species are a commuter population; they land fish in Dulac or purchase fish in Dulac, but they live elsewhere. Three dealers purchase fish from longline vessels; two are owned and operated by first-generation Vietnamese immigrants, and the other is run by a New Orleans native whose father operates a large tuna wholesale company in Venice.

Demographic Profile of Dulac (Source: U.S. Bureau of the Census, 1990)

Population: 3,273

Racial and Ethnic Composition: About 50 percent Caucasian; almost half of the population is Native American (Houma Indian), a tribe not recognized by the U.S. government; less than two percent African-American or Hispanic; and less than two percent of the population is Asian/Pacific islander, despite the fact that most of the longline captains who sustain the Dulac commercial industry for tunas, swordfish, and sharks are Vietnamese. Many of the Caucasians in Dulac are of French or French-Canadian ancestry.

Age Structure: More than 50 percent aged 18-64; ten percent under age five; 27 percent aged five to 17; seven percent above age 65.

Household Composition: 910 households; average of 3.59 persons per household.

Educational Trends: Only 27 percent of Dulac residents 25 years and older had completed high school. Half of the population over 25 years old did not complete the ninth grade.

Per Capita Income: $4,946; this is lower than the per capita income of Venice ($6,949); state average $10,635. Nearly half of the Dulac population was living in poverty at the time of the 1990 Census. The median household income was $12,653, and 44.5 percent of the families in town lived below the poverty level. Of the 922 Dulac households where income was recorded, wage earners were present in only 66 percent of them. Thirty percent of the households received Social Security income that averaged $7,254 annually, and more than 20 percent received public assistance that averaged less than $3,000.

Employment: Forty-six percent of residents 16 years old or older are considered to be in the work force. Unemployment rate is 17.5 percent. Fully seventeen percent hold farming, forestry and fishing jobs. Other occupations in Dulac include handlers, equipment cleaners,

helpers, laborers, service, precision production, craft and repair, and transportation and material moving.

Fishing Organizations: Pelagic longline fishermen may belong to Blue Water Fishermen's Association.

The Pelagic Longline Fishery

Pelagic longline fishermen in Dulac target yellowfin tuna all year. There is no established quota or season for yellowfin, but rough winter weather shortens the fishing season slightly. Reported prices for yellowfin tuna landed by longline vessels in Dulac range from $3.50 to $5.00 per pound for the highest grade. Bluefin tuna is caught in this fishery but can only be landed if target catch requirements are met. Swordfish is not targeted by Dulac longline vessels, and incidentally-caught sharks are often discarded (Wilson *et al.*, 1998). A typical trip for the pelagic longline vessels in Dulac is two weeks. Vessels range in size from 60 to 100 feet and set between 35 and 40 miles of longline rigging. Most operators fish for live bait for two or three days at the start of a trip. Fishermen prefer to use live bait for targeting yellowfin tuna, as opposed to the frozen squid and light sticks often used for targeting swordfish.

The competition between dealers is perceived as becoming more aggressive. Traditional patterns of dealers building relationships by extending services and credit to vessels are giving way to price-based competition to gain access to vessels. Researchers reported that one dock in Dulac employed three to four people, but laid them all off in 1998. That dealer purchases tuna (50 percent), shark (30 percent), swordfish (20 percent), and dolphin, wahoo, and amber jack (20 percent combined). Another dealer employs six or seven people, all of whom live in Dulac. Of this dealer's purchases, 60 percent are tuna, 20 percent are swordfish and 20 percent are divided among other pelagic species like shark, wahoo, amber jack. A third dealer employs six Mexican workers, supplemented by local residents on a seasonal basis (Wilson *et al*, 1998). The pelagic longline fleet is not well integrated into the Louisiana communities of Dulac and Venice. They are commuters and most of them are from a different ethnic background, including many Vietnamese.

Researchers found that alternative employment outside of the fishery is available. For instance, while unemployment in Louisiana fishing communities has been high in the past, the oil industry has hired unskilled labor from this area in recent years. The agricultural sector also provides employment opportunities, as reported by one Vietnamese-American captain, particularly during the off-season for fishing. However, this supply of alternative employment threatens the stability of the labor pool for the fishing industry (Wilson *et al.*, 1998). This is true for both captain and crew positions, particularly among the non-Vietnamese-American population. The Vietnamese-American community has avoided such personnel problems to some extent by relying on tight kinship networks in both fishing and fish buying. The Vietnamese-Americans, however, did report some difficulty in finding captains. The Vietnamese-American community was the only one studied which reported recent investment in new longline vessels. Other concerns cited were safety of small vessels during winter openings, and the prospect of small vessels having to pay for observers and

VMS. In Louisiana, the impacts of regulation may be felt more intensely by the Vietnamese-American community given the extent of their investment in this fishery.

The Shark Bottom Longline Fishery

Dulac is also a home port for a limited inshore shark longline fishery. Blacktip shark is the main catch in the bottom longline fishery for sharks. These fishermen do not fish much during the winter because of the safety concerns of these small vessels (Wilson *et al*., 1998). Typically, sharks are caught between five and 20 miles from shore. Almost all vessels that sell in Dulac are owner-operated. Owners are usually their own captains or they hire a close relative to captain their vessel. Good first mates try to acquire their own vessels. At least five longline vessels that were built last year have been added to the fleet in Dulac. Some participants in the longline fishery for sharks also participate in the reef fish fishery. It would be difficult for shark fishermen to switch into the yellowfin tuna fishery (Wilson *et al*., 1998).

The primary concern of dock owners is the need to have a consistent supply of fish. At one point in the early 1990s, a Dulac dealer was selling 50,000 pounds of fillet shark a week to supermarket chains. Now they sell much less because the markets do not like the unpredictability of supply. Before the seasonal closures of the directed shark fishery, the average price of shark was $0.50 per pound, while now it is only $0.30 per pound (Wilson *et al*., 1998). Respondents say they can live with the 4,000-pound commercial retention limit, given the size of their vessels, but they need to fish year-round. A consistent supply would help them recapture sales to supermarkets. All fishermen in this community are experiencing competition from seafood imports. Members of the fishing and supply industries reported price fluctuations in the shark fishery, which they attributed to the difficulty in maintaining steady supplies under derby-style quota management.

Main concerns of the fishermen in Dulac include regulations that reduce flexibility in where and when they can seek fish (Wilson *et al*., 1998). Price fluctuations are also a concern. Shark longline fishermen say shifting the start of the year to June 1 would help smaller vessels that cannot fish in the Gulf during the winter. Fishermen and dock owners called Louisiana restrictions on shark fishing in state waters "devastating" and they would also like comparable regulations for recreational fishermen. Bluefin tuna regulations in 1987 and 1988, which prohibited a directed fishery in the Gulf of Mexico spawning area, reportedly forced some fishermen and dock owners out of business. Previously, shark fishermen had to have both state and federal licenses to fish for shark in federal waters off Louisiana and several respondents said that Federal and state regulations for catching shark were contradictory and confusing. The state license was needed to transport shark through state waters to a dock for sale. If a shark vessel had both a federal and state license, it could not fish in state waters when the federal season is closed (recent changes to state regulations concerning sharks in Louisiana have addressed some of these concerns). Local fishermen do not longline for shark; they use nets and need a permit to bring their state-banned gillnet through state waters. Local net shark fishing occurs mostly inshore during the spring when sharks are pupping. Closure during that season would eliminate the industry.

Researchers also questioned fishery participants about the proposed alternative to implement a minimum size for sharks. They found that Louisiana longline vessels are fishing mainly for blacktip sharks and the fishermen estimate that 95 percent of their catch are sharks measuring less than 50 inches in length. Researchers found that the Louisiana shark fleet is already made up of smaller vessels that are not affected by the status quo 4,000-pound shark commercial retention limit because of their limited capacity. The main desire in the shark fleet appeared to be avoiding disturbances in supply. Researchers concluded that the overall effect of increased restrictions on this commercial fleet would be a redirection of fishing effort on grouper and yellowfin tuna, increased difficulty in finding and retaining employees, and an acceleration in the rate at which the fleet's vessels and experienced fishermen are moving overseas, especially to Mexico. Respondents expressed concern that there is movement from the shark fishery to the pelagic longline fishery targeting yellowfin, similar to the previous movement from red snapper to shark
(Wilson *et al*., 1998).

Community Impacts in Dulac, Louisiana

Accounting for dead discards in swordfish management could result in an estimated 13-percent decrease in total revenues in the swordfish fishery, beginning in 2000. This estimate is based on the weight of 1997 dead discards relative to 1997 total mortality in the U.S. north Atlantic swordfish fishery. This measure may also affect the timing of closures of the directed fishery. If ICCAT adopts an international ten-year rebuilding program for north Atlantic swordfish, it could result in a 27-percent decrease in TAC for the United States. However, the associated social impacts are not likely to be as large in Dulac as in other longline communities, since fishermen in this area generally do not target swordfish. Vessels that do rely heavily on swordfish revenues would be forced to shift some effort to other fisheries or exit fishing altogether. Displaced effort may shift to longlining for dolphin fish, wahoo, and BAYS; the snapper-grouper fishery (although there is limited access); or the shrimp fishery.

The requirement to have VMS onboard every pelagic longline vessel fishing for HMS will involve a substantial one-time cost ($1800 for unit plus $100 for installation) for the pelagic longline vessels in Dulac, but this measure is necessary to implement time area closures effectively. Together, the measures in the swordfish rebuilding plan and the VMS requirement may have some social impacts on the pelagic longline community of Dulac, but NMFS maintains that these actions are necessary to rebuild the swordfish fishery. The ICCAT Rebuilding Program for bluefin tuna will not have any social impacts on the pelagic longline fishing community in Dulac, since the Rebuilding Program does not call for decreased quotas, the FMP maintains status quo allocation patterns, and pelagic longline vessels are prohibited from targeting bluefin tuna.

The limited access program may have minor social impacts on the pelagic and shark bottom longline fisheries in Dulac; however, this system removes latent effort only and issues directed and incidental permits based on historical and current fishery participation. Directed permits will allow fishermen to operate under the quotas, seasons, and commercial retention limits established under this FMP. Lower retention limits for incidental permit holders should

allow fishermen to continue to land fish in quantities similar to current levels. Transferability of permits also allows fishermen flexibility in business planning.

The minimum size for ridgeback sharks may substantially change the way in which the large coastal shark fishery operates by pushing fishermen farther offshore to target adult fish and possibly increasing the number of days per trip and increasing the cost of fishing. Reducing the non-ridgeback large coastal shark quota is likely to have substantial social impacts on the shark bottom longline fishery in Dulac because blacktip sharks, the primary non-ridgeback species, are a dominant species in this fishery. This measure may result in severe economic effects in the short term because additional reductions in the allowable blacktip quota may result in those fishermen that were marginal after the 1997 reductions to cease operations. The cap on the commercial quota for small coastal sharks will limit opportunities for fishermen to expand their current operations to target small coastal sharks as an alternative to large coastal sharks. Limited access may also limit the opportunities of Dulac fishermen to expand fishing into other fisheries.

Counting dead discards and landings in state waters after Federal closures against the Federal shark quota will likely have substantial social impacts by reducing the available quotas and the already short Federal shark seasons are likely to become even shorter or preclude Federal waters from opening. This measure may create further incentive for them to cancel their Federal shark permits in order to fish in less restrictive or unregulated state waters although the implementation of limited access should reduce that incentive. This action may put some fishermen out of business in Dulac, shorten the fishing season, cause market gluts, and lower ex-vessel prices. It may also increase variable costs and decrease gross revenues by pushing fishermen out of waters where sharks are abundant and into waters where target species are also less abundant. The final action prohibiting dusky sharks may have adverse social impacts in Dulac, however the impacts of this action are likely to be less in Dulac than other communities because dusky sharks are less common in northern Gulf of Mexico. The other species included in the prohibited species management unit are unlikely to have any social impacts on the shark bottom longline fishery because most fishermen do not harvest these species.

While these actions are likely to have substantial negative social impacts on the community, scheduling shark fishery openings for specified periods and establishing season-specific quotas may somewhat mitigate the negative social effects. Thess measure are likely to increase the predictability of the large coastal shark fishery by eliminating the uncertainty of fishery closures and allowing more advance planning of fishing trips. They will also improve the ability of shark dealers and retailers to make long term plans for marketing and advertising. As Dulac shark fishermen participate in both the first and second seasons, season-specific quotas may not reduce revenues but may increase fishing opportunities in the second season.

Nevertheless, NMFS is aware that the cumulative impacts of the shark measures in this FMP may put some fishermen out of business and result in a permanent loss of community infrastructure in Dulac. NMFS implements these final measures despite the magnitude of the negative impacts on some communities, including the shark bottom longline community in

Dulac, in order to rebuild large coastal sharks and prevent overfishing of pelagic and small coastal sharks and provide for the sustained participation of all communities, consistent with Magnuson-Stevens Act requirements. In the long term, these actions will shorten the time it takes to rebuild these fisheries. An economically viable shark fishery, without market gluts and short seasons will have long-term benefits for fishing communities.

9.7.2 Venice

Venice is located about 30 miles south of the parish seat Point à la Hache, which is flanked by eroding wetlands and levees that border the Mississippi River. The unemployment rate is low compared to that of Dulac, perhaps because Venice has been the epicenter of oil industry activity in Louisiana. The main job opportunities in Venice are oil, seafood and, increasingly, recreational fishing. Venice extends into the Gulf of Mexico close to billfish areas that are frequented by recreational fishermen. Recreational fishing increased steadily there during the 1990s. Animosity regarding competition for fish extends to the political arena, as commercial and recreational fishermen oppose each other on regulatory issues. Commercial fishery participants claim that they are harassed by law enforcement agents, while recreational fishery participants claim that regulations are not enforced in Venice because there are simply not enough agents to cover the area. Among local commercial fishermen, there is a sense that recreational fishermen have helped create a regulatory environment that is pushing commercial fishermen out of business (Wilson *et al.*, 1998).

There is no evidence that local residents participate in commercial fisheries for HMS. Most pelagic longline fishermen who sustain the yellowfin tuna industry in Venice are Vietnamese-Americans who live in New Orleans or a suburb of the city. Even Louisiana natives who fish for shark with nets in state waters live in neighboring towns, not in Venice. Shrimp is the largest commercial catch bought and sold in Venice, although this fishery has become less profitable since the late 1980s (Wilson *et al*., 1998). The longline fleet is not at well integrated into the Louisiana community of Venice. They are commuters and most of them are from a different ethnic background, including many Vietnamese-Americans. Due to the language barrier, many of these fishermen do not participate in public fisheries meetings.

Demographic Profile of Venice (Source: U.S. Bureau of the Census, 1990)

Population: 2,743 in Boothville-Venice.

Racial and Ethnic Composition: 66 percent Caucasian; 28 percent African-American. The categories American Indian, Eskimo or Aleut, and Hispanic made up two percent each. Thirty-three percent of people who reported their ancestry said they were French or French-Canadian. Only 18 residents were Vietnamese-American, despite the fact that many of the longline captains and dock owners who sustain the Venice commercial industry for tuna, swordfish, and shark are Vietnamese-American.

Age Structure: Nearly 58 percent of the population was 18 to 64 years old; 25 percent aged five to 17; 11 percent under age five; about six percent above age 65.

Household Composition: 844 households; average of 3.25 people living in each. Approximately 15 percent of the population lived in a one-person household.

Educational Trends: Only 43.5 percent of the population 25 years and older graduated from high school. Nearly 30 percent of the population over 25 years old did not complete the ninth grade.

Per Capita Income: $6,949; this is higher than the per capita income of Dulac ($4,946); state average ($10,635). Thirty-six percent of the population lived below the poverty level. The median household income was $16,250. Eighteen percent of the households received Social Security, averaging $5,433 per year, and 11 percent of the households received public assistance income, averaging $3,301 per year.

Employment: Only half the Venice population age 16 and older was considered to be in the labor force. Of those, 6.4 percent were unemployed. Retail businesses employed 16 percent of residents, while agriculture, forestry, fisheries and transportation employed 14.5 percent of residents.

Fishing Organizations: These fishing organizations may include Off Shore Longliners and Shark Taggers Association; Blue Water Fishermen's Association; Baton Rouge Big Game Fishing Club; New Orleans Big Game Fishing Club; and Southwest Louisiana Fishing Club.

The Pelagic Longline Fishery

By the late 1980s, the domestic market for fresh tuna developed and prices for yellowfin tuna rose. Locals say some longline vessels from Florida and New Jersey fished for swordfish and bluefin tuna in the area near Venice during the late 1980s and early 1990s. Vietnamese and American fishermen re-rigged their vessels from shrimping to pelagic longlining for tuna, at an estimated cost of $1,000 per mile of line; most outfitted their vessels with 20 to 40 miles of line. The oil industry was also in decline at this time which resulted in the outfitting of some oil vessels with longline gear (Wilson *et al*., 1998). As a result of fluctuating prices for yellowfin tuna, some longline vessels went back to shrimping

and others left for the Pacific Ocean. The industry has reached an equilibrium in terms of vessels and in terms of yellowfin tuna price, which fluctuates but is generally $4.00 to $5.00 per pound for the highest grade (Wilson *et al.*, 1998).

Several dealers in Venice draw 40 percent of their business from the longline fleets. Another dealer draws only about 20 percent from longline vessels. A large wholesaler deals only in longline catches and purchases fish from three of the four local dealers. In 1997, 60 percent of his business was tuna, 30 percent shark and 10 percent swordfish. The competition between dealers is perceived as becoming more aggressive (Wilson *et al.*, 1998). Traditional patterns of dealers building relationships by extending services and credit to vessels are giving way to price-based competition to gain access to vessels.

While pelagic longline fishermen with large vessels work year-round, pelagic longlining in the area tends to intensify in May and ease up during the wintertime. There are four docks in Venice where longline vessels unload. Docks in Venice employ between five and 15 workers on a seasonal basis for unloading vessels and packing seafood, as well as five to eight people year-round. The docks purchase tuna year round, shrimp from May through December, bottom fish such as drum, catfish, and sheepshead, from January through May, mullet (for the roe) from October through December.

Researchers found that alternative employment outside of the fishery is available. For instance, the oil industry has hired unskilled labor from this area in recent years. The agricultural sector also provides employment opportunities during the off-season for fishing, as reported by one Vietnamese-American captain. However, researchers found that this relatively ready supply of alternative employment threatens the stability of the labor pool for the fishing industry. The Vietnamese-American community has avoided such personnel problems to some extent by relying on tight kinship networks in both fishing and fish buying, although they did report some difficulty in finding captains. The Vietnamese- American community was the only one studied which reported recent investment in new longline vessels. Concerns cited by the fishermen in Venice included the safety of small vessels during winter openings, and the prospect of small vessels having to pay for observers and VMS.

Other commercial fisheries in the area that could provide alternative employment include pompano in October, mullet from October to January, shrimp from May to December and oysters from January to May (Wilson *et al*., 1998). Researchers concluded that the overall effect of increased restrictions on this fleet would be increased pressure on grouper and yellowfin tuna, increased difficulty in finding and retaining employees, and an acceleration in the rate at which the fleet's vessels and experienced fishermen are moving overseas, especially to Mexico.

The HMS Recreational Fishery

Recreational fishermen fish from Venice year-round, but are affected by inclement weather during the winter. The larger vessels can fish for yellowfin tuna year round, in addition to inshore species like redfish, snapper and speckled trout. Bluefin tuna are found too far away (100 miles offshore) and recreational fishermen are prohibited from directing

effort on bluefin tuna anyway. They fish for billfish, particularly blue marlin, from May through November. Blacktip shark was once a popular catch, but recreational fishermen say they are now too small to be an enjoyable catch. There is some animosity between recreational and commercial fishermen which seems to arise from competition for particular species.

There are only two marinas in Venice that cater to recreational fishermen, although a third parish-run marina offers vessel slips to both recreational and commercial fishermen. One opened in the mid-1980s and offers boat slips, launches, a hoist, a couple of condominiums, baitshop, fuel and ice. It employs 13 people during peak summer months. Most of the marina's business comes from private vessels from New Orleans and border states. Less than one percent of this business consists of charterboats. The other marina opened only a few years ago, offering 120 pre-paid boat slips, a 64-room two-story hotel, condominiums, a dry dock storage facility, fuel and ice. It employs 12 to 15 people in its newly opened hotel and another 15 to 25 in the marina. Eight charterboats operate from the marina, and there is room for ten more.

Researchers reported that the catch and release ethic for billfish is strong among recreational fishermen in Venice, but local billfishing tournaments require that trophy fish be brought to the dock and weighed. Sportfishermen prefer to catch and retain tunas, dolphin fish, and wahoo for consumption, although they voiced support for tag and release programs.

Community Impacts in Venice, Louisiana

Accounting for dead discards in swordfish management could result in an estimated 13-percent decrease in total revenues in the swordfish fishery, beginning in 2000. This estimate is based on the weight of 1997 dead discards relative to 1997 total mortality in the U.S. north Atlantic swordfish fishery. This measure may also affect the timing of closures of the directed fishery. If ICCAT adopts an international ten-year rebuilding program for north Atlantic swordfish, it could result in a 27-percent decrease in TAC for the United States. However, the associated social impacts are not likely to be as large in Venice as in other longline communities, since fishermen in this area generally do not target swordfish. Vessels that do rely heavily on swordfish revenues would be forced to shift some effort to other fisheries or exit fishing altogether. Displaced effort may shift to longlining for dolphin fish, wahoo, and BAYS; the snapper-grouper fishery (although there is limited access); or the shrimp fishery.

The requirement to have VMS onboard every pelagic longline vessel fishing for HMS will involve a substantial one-time cost ($1800 for unit + $100 for installation) for the pelagic longline community in Venice, but this measure is necessary to implement time area closures effectively. Together, the measures in the swordfish rebuilding plan and the VMS requirement are likely to have some social impacts on the pelagic longline community of Venice, but NMFS maintains that these actions are necessary to rebuild the swordfish fishery. The ICCAT Rebuilding Program for bluefin tuna will not have any social impacts on the pelagic longline fishing community in Venice, since the Rebuilding Program does not call for

decreased quotas, the FMP maintains status quo allocation patterns, and pelagic longline vessels are prohibited from targeting bluefin tuna.

The limited access system implemented by this FMP may have minor social impacts on the pelagic and shark bottom longline fisheries in Venice; however, this system removes latent effort only and issues directed and incidental permits based on historical and current fishery participation. Directed permits will allow fishermen to operate under the quotas, seasons, and commercial retention limits established under this FMP. Lower retention limits for incidental permit holders are established that should allow fishermen to continue to land fish in quantities similar to current levels. Transferability of permits also allows fishermen flexibility in business planning.

Overall, the final measures under this FMP for sharks may have substantial impacts for those pelagic longline fishermen in Venice that depend on shark fishing and may force captains and crew to pursue jobs in the recreational and charter/headboat fisheries. NMFS maintains that the final actions to announce fishery seasons ahead of time and establish season-specific quotas may minimize these impacts and increase the stability and predictability of shark fisheries, particularly large coastal shark fisheries. Finally, NMFS maintains that the impacts have been minimized to the extent practicable and that final actions are necessary to rebuild large coastal sharks and prevent overfishing of pelagic and small coastal sharks, consistent with Magnuson-Stevens Act requirements.

The final action to establish a minimum size of 4.5 feet in the recreational shark fishery will likely have substantial social impacts in Venice because many sharks harvested in this fishery are smaller than this minimum size, particularly in nearshore waters. This action may essentially establish a catch and release fishery for sharks in near-shore waters. Social impacts for offshore anglers will be minor because most sharks harvested offshore are larger than this minimum size. Reducing the recreational retention limit will likely have substantial social impacts by limiting charterboat and tournament operations that want to retain their shark catches; however, researchers have noted an increasing catch-and-release ethic among anglers which may mitigate any negative impacts. The final action to establish an allowance of one Atlantic sharpnose shark per person per trip should also minimize social impacts considerably. Additionally, anglers may be willing to pay more for the opportunity to catch larger sharks once the stocks rebuild, bringing positive social impacts to the recreational shark fishing community of Venice in the long term. Overall, the final actions to implement a minimum size for all sharks and to reduce the recreational retention limit may have substantial impacts on the Venice recreational shark fishery although the allowance of one Atlantic sharpnose shark per person should mitigate these impacts.

This FMP also establishes a recreational retention limit of three yellowfin tuna per person per day. This measure is not likely to have a major social impact on the recreational fishery because LPS data indicate that although 79 percent of trips have three or more anglers on board, only five percent of trips land more than nine yellowfin. Based on an average size of 33 pounds, this measure will allow approximately 99 pounds of yellowfin per person per trip. NMFS concludes that this is an adequate amount for consumptive use by recreational and charter/headboat anglers.

The requirement for charter/headboat vessels to obtain a permit and submit logbooks will have an economic impact for vessels that do not already have a Charter/Headboat permit for tunas. The charter vessel owner will be charged a fee for the vessel permit (probably $20 to $40) to cover administrative costs. The logbook will cost the charter captain time to fill out and send to the appropriate NMFS office. However, public comment at scoping meetings and at HMS AP meetings indicated significant support for this alternative among charter/headboat captains. Many captains already fill out such logbooks and feel that faxing their report to NMFS is a small burden when weighed against the benefit of supporting more effective HMS management. Tournament registration for all HMS will impose an additional reporting burden on shark and tuna tournament operators, who are not currently reporting on billfish tournament forms. However, these measures are not likely to have large social impacts on the recreational fishing community in Venice.

NMFS maintains that the final actions in this FMP are necessary to rebuild overfished stocks of swordfish and large coastal sharks and prevent overfishing of small coastal sharks; these management measures are designed to minimize social and economic impacts while allowing for limited harvest of sharks.

9.8 Conclusion

In most cases, the requirement to rebuild overfished stocks requires a reduction in fishing mortality and associated loss of revenues and community stability for fishing communities. In the case of Atlantic HMS, several overfished stocks are in a severely depleted condition, and rebuilding may require substantial reductions in fishing effort. To the extent practicable, NMFS has selected management alternatives that minimize adverse impacts on fishing communities while effectively meeting the conservation requirements of NS 1.

For north Atlantic swordfish, the longest rebuilding program allowed under the Magnuson-Stevens Act was chosen in order to provide swordfish-dependent fishing communities sustained access to the resource during the rebuilding period. This action allows NMFS to achieve conservation objectives while minimizing, to the extent practicable, adverse impacts on fishing communities. NMFS has taken the first step toward minimizing the negative economic impacts of a rebuilding plan by implementing limited access in the longline fishery. The limited access program is designed to eliminate latent effort, while enabling those who are financially dependent on the swordfish fishery to continue to participate (consistent with conservation requirements.) This FMP also establishes the foundation for the development of an international ten-year rebuilding plan for bigeye tuna; socio-cultural impacts will be analyzed at such time as the United States adopts a recommendation from ICCAT to rebuild this fishery. These inter-national rebuilding plans are likely to have some effect on other fisheries in the United States as NMFS takes measures to reduce fishing mortality of bigeye and swordfish and fishing effort shifts to other species. Impacts on other fisheries will be analyzed through the rulemaking process before the United States implements any rebuilding plans adopted by ICCAT.

In light of the results of the 1998 west Atlantic bluefin tuna stock assessment, reductions in the TAC are not required at this time, so the ICCAT Rebuilding Program will provide for

sustained participation in all bluefin tuna fishing communities. Domestic allocation of the bluefin quota will remain the same, aside from a 250 mt cap on purse seine landings. At this time, the bluefin tuna management measures in the HMS FMP will not displace any fishing effort that would affect other fisheries. Furthermore, there are no measures for yellowfin, albacore or skipjack tunas that are likely to affect other fisheries through displaced effort. Since north Atlantic albacore is now considered overfished based on the status determination criteria in this FMP, NMFS will develop a rebuilding plan for the stock in 2000. This rebuilding plan may have some effect on other domestic fisheries; NMFS will conduct an analysis of potential impacts through the rulemaking process.

For large coastal sharks, rebuilding requires substantial reductions in fishing mortality. The rebuilding plan for large coastal sharks is designed to allow the highest possible level of access to the resource for participants with an active history in the fishery, while also implementing necessary conservation measures for those species that cannot sustain significant fishing pressure. NMFS has taken steps to minimize adverse economic impacts to active fishermen by implementing limited access in the longline fishery, scheduling shark fishery openings for specified periods and establishing season-specific quotas. However, it is likely that implement-ation of the large coastal shark rebuilding program will have adverse impacts on some fishing communities, particularly in Florida and North Carolina. These measures will likely cause some participants to leave the fishery. See the Regulatory Flexibility Analysis in Chapter 7 for a description of potential impacts on other fisheries.

Overall, NMFS has tried to minimize social and cultural impacts by analyzing alternative management measures such as minimum sizes, time/area closures, and limited access; alternative measures have been implemented in place of quota reductions when possible. Substantial involvement from the affected public was an important contribution to the analysis of social and economic impacts. For all species, NMFS maintains that the final actions in this FMP are the least restrictive measures that are consistent with the conservation requirements of the Magnuson-Stevens Act. In the long run, rebuilt stocks are the best possible guarantee of healthy fisheries and sustained participation by the communities that depend on HMS.

Note: The following figures (Figures 9.1 to 9.8) indicate the current zip codes of permit holders in HMS fisheries. Each star represents an individual permit. The final actions, including limited access, are not expected to greatly affect the distribution of permit holders. HMS permit holders in the western United States are not shown in these figures.)

Figure 9.1 1998 Tuna Permit Holders, Incidental Category

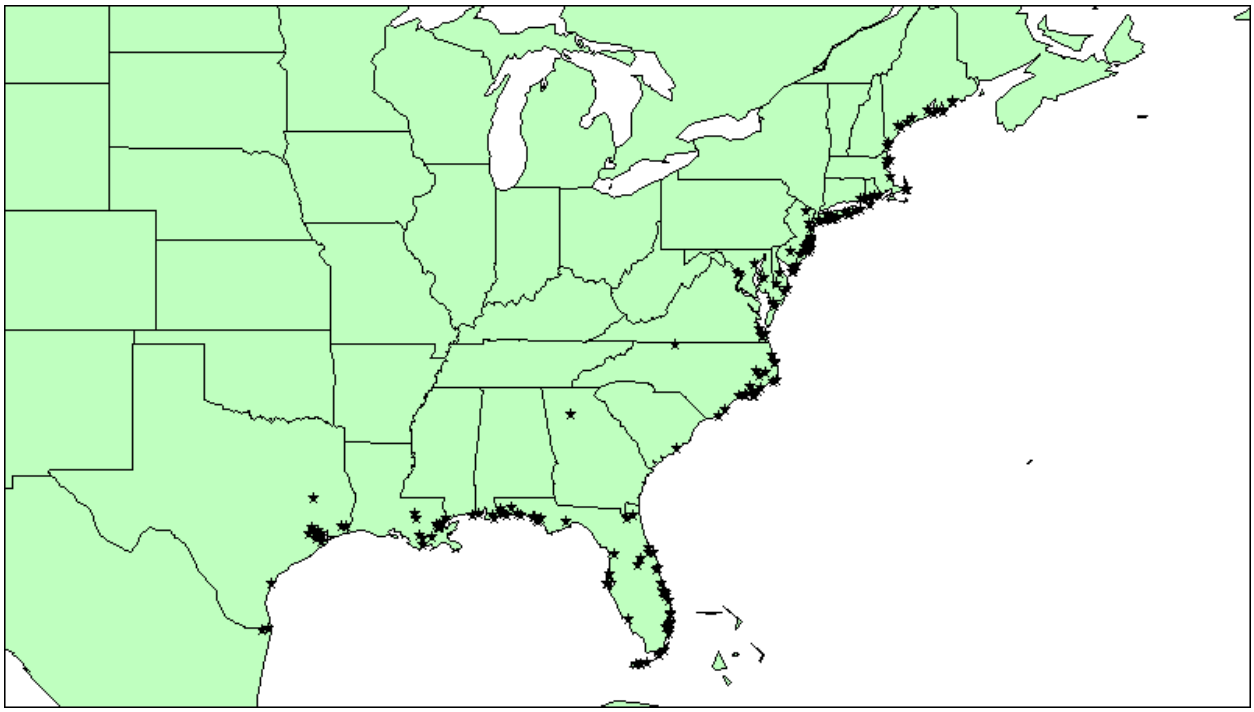


Figure 9.2 1998 Tuna Permit Holders, Harpoon Category

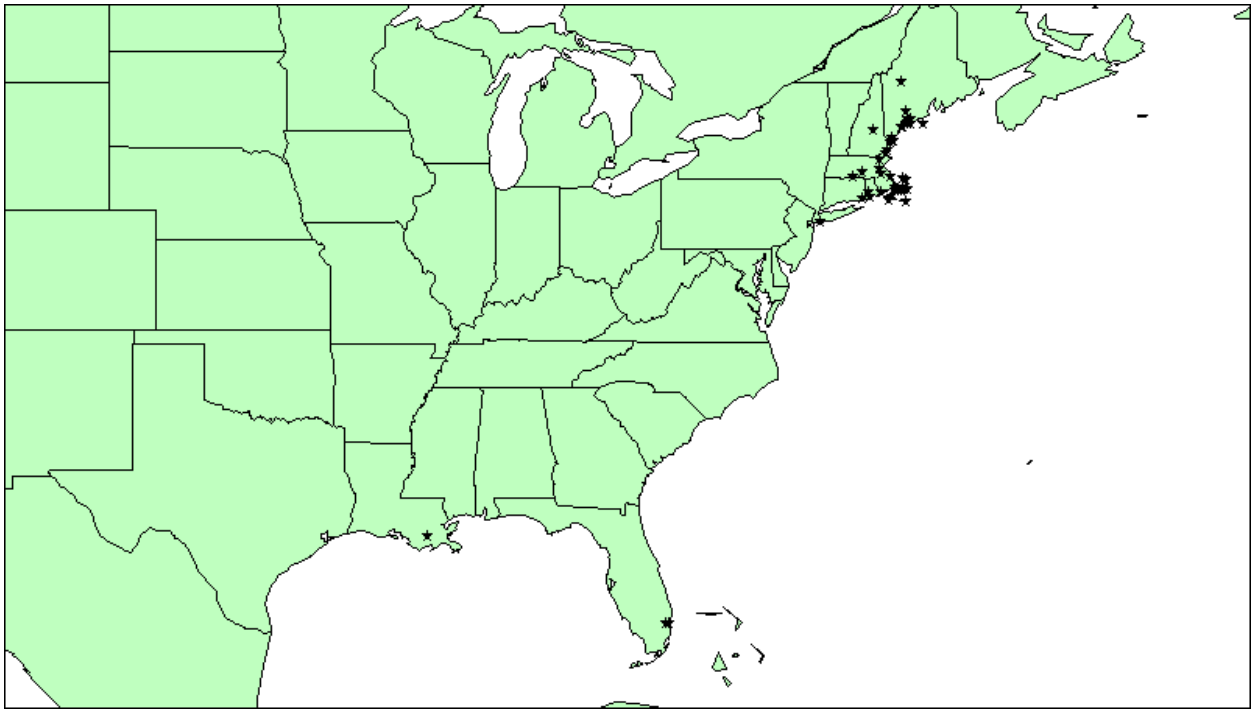


Figure 9.3 1998 Tuna Permit Holders, General Category

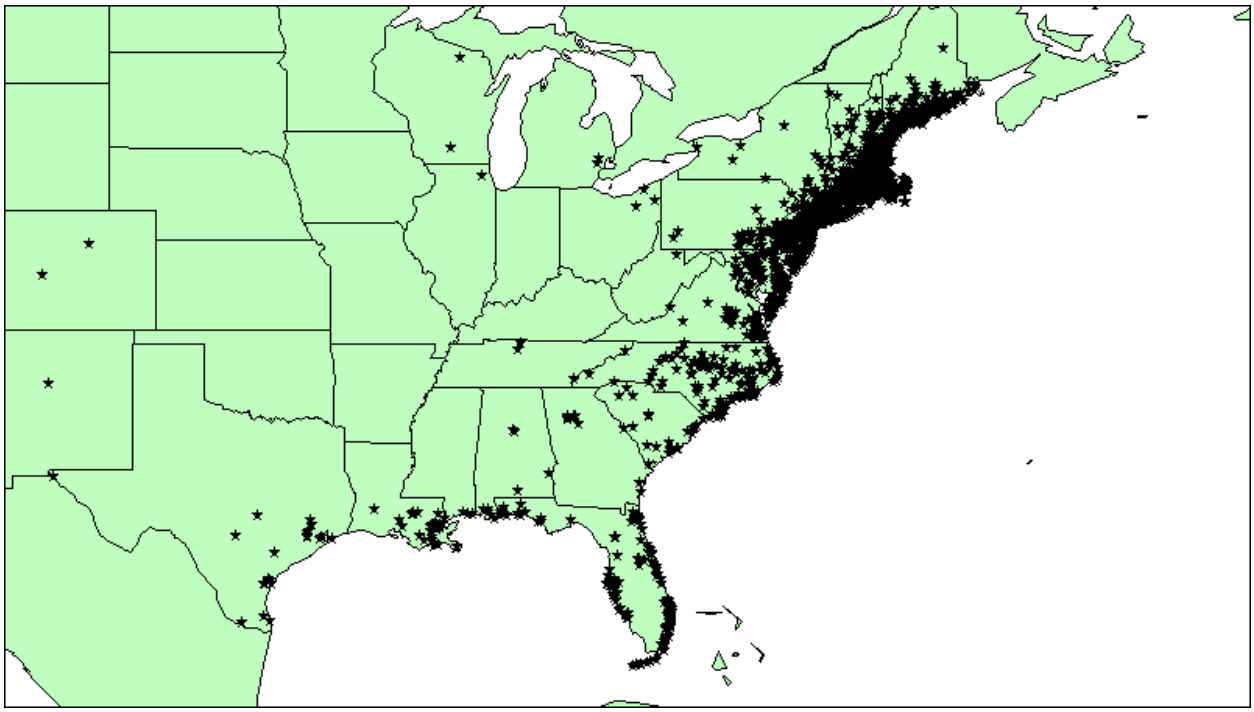


Figure 9.4 1998 Tuna Permit Holders, Charterboat Category

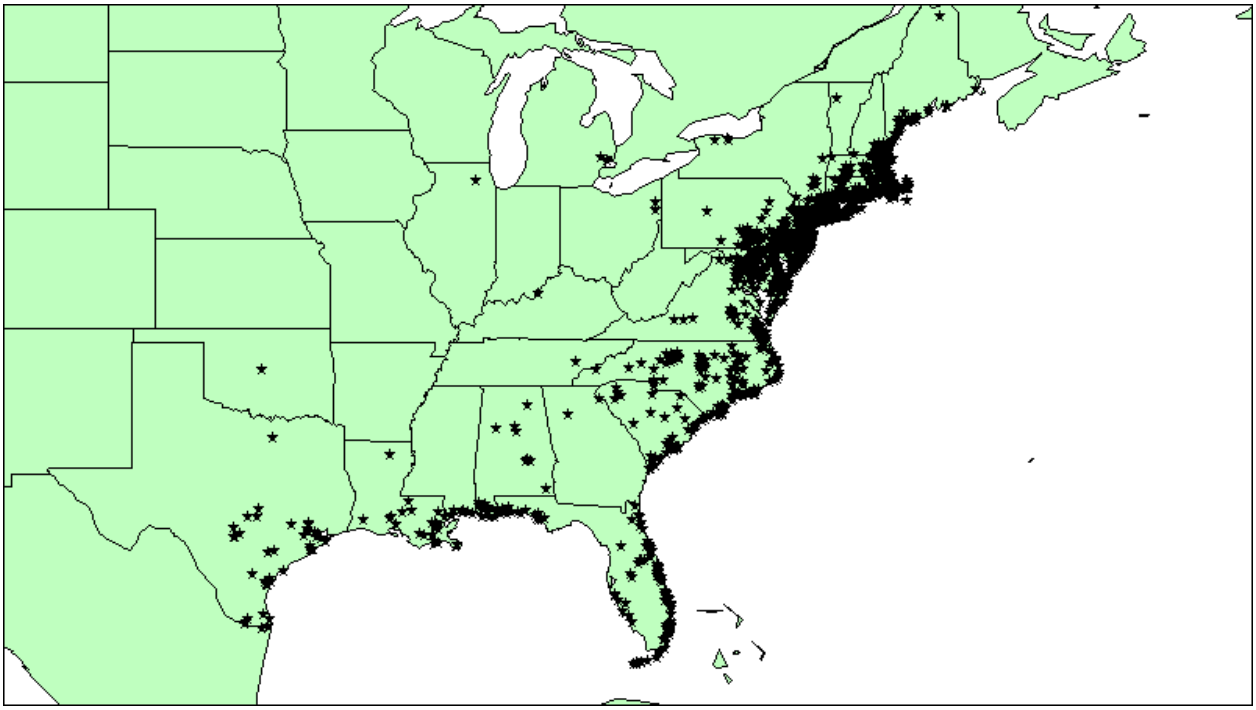


Figure 9.5 1998 Tuna Permit Holders, Angling Category

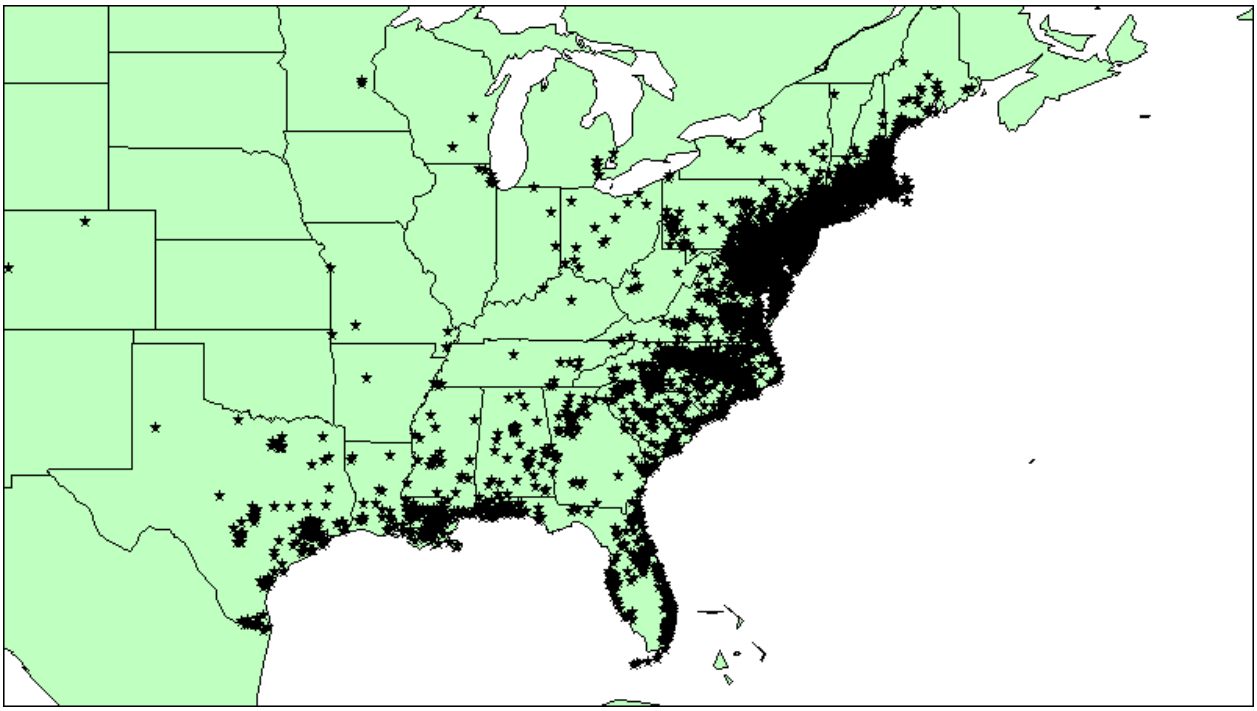


Figure 9.6 1998 Swordfish Permit Holders

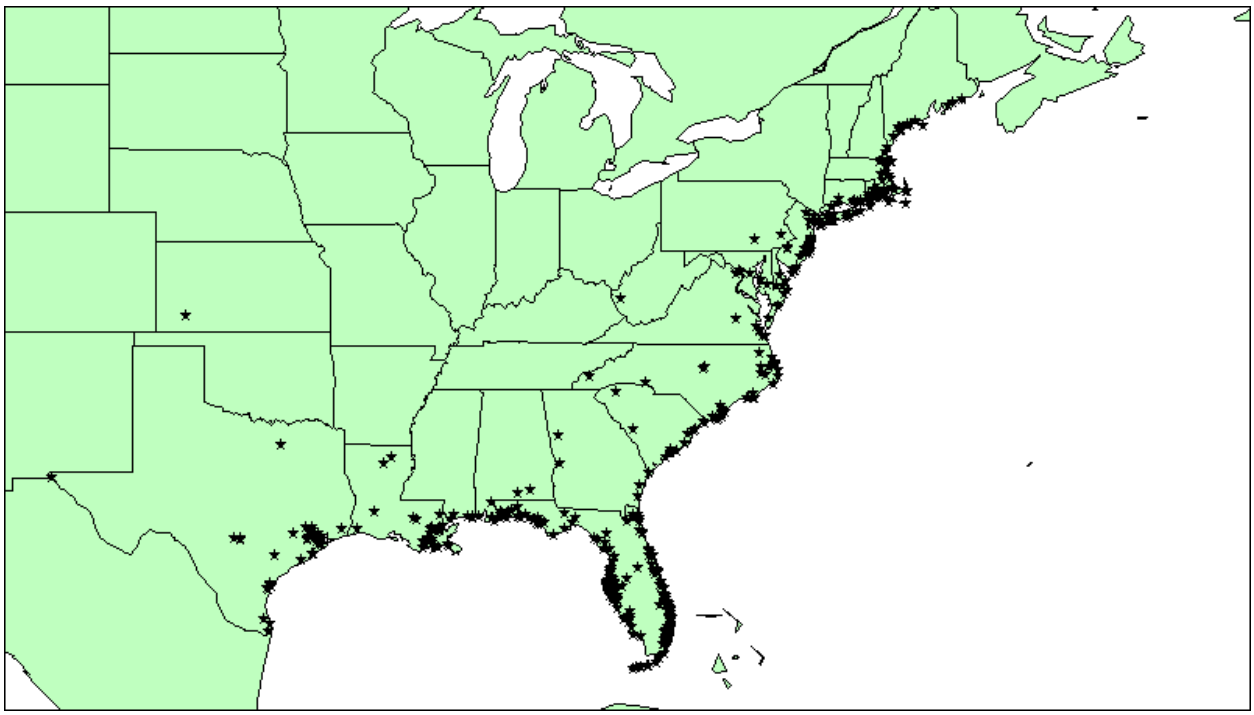


Figure 9.7 1998 Shark Permit Holders

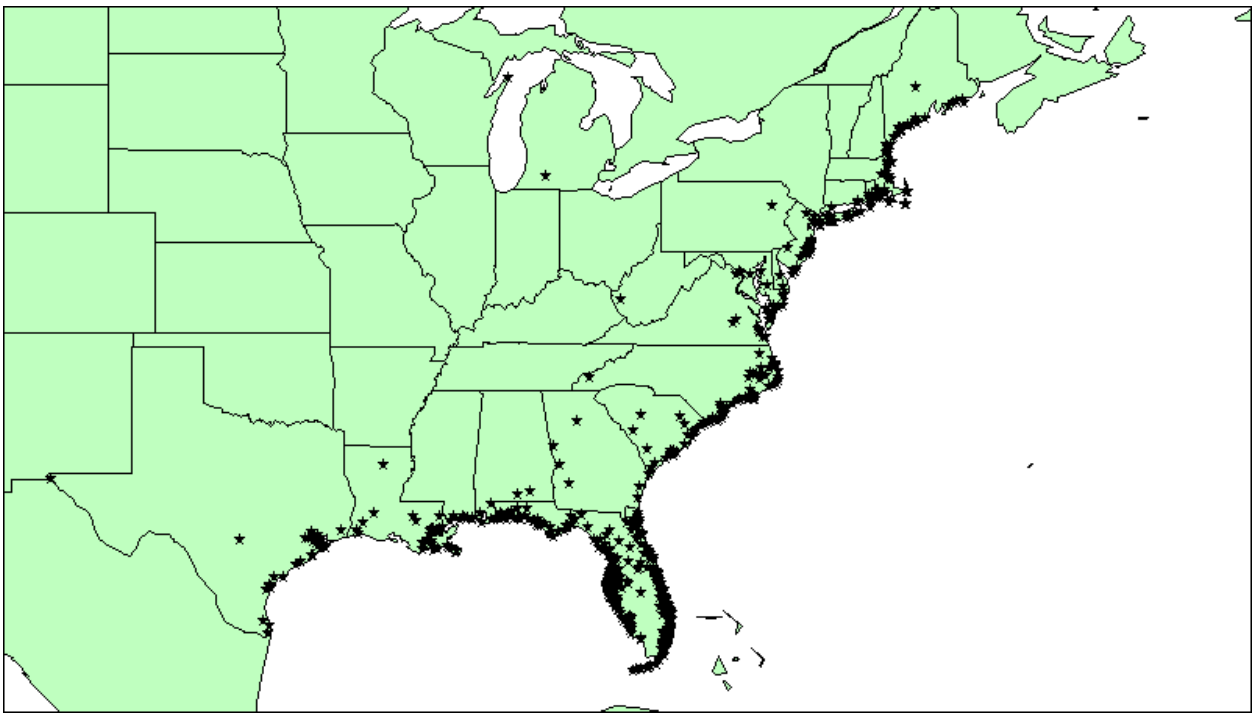
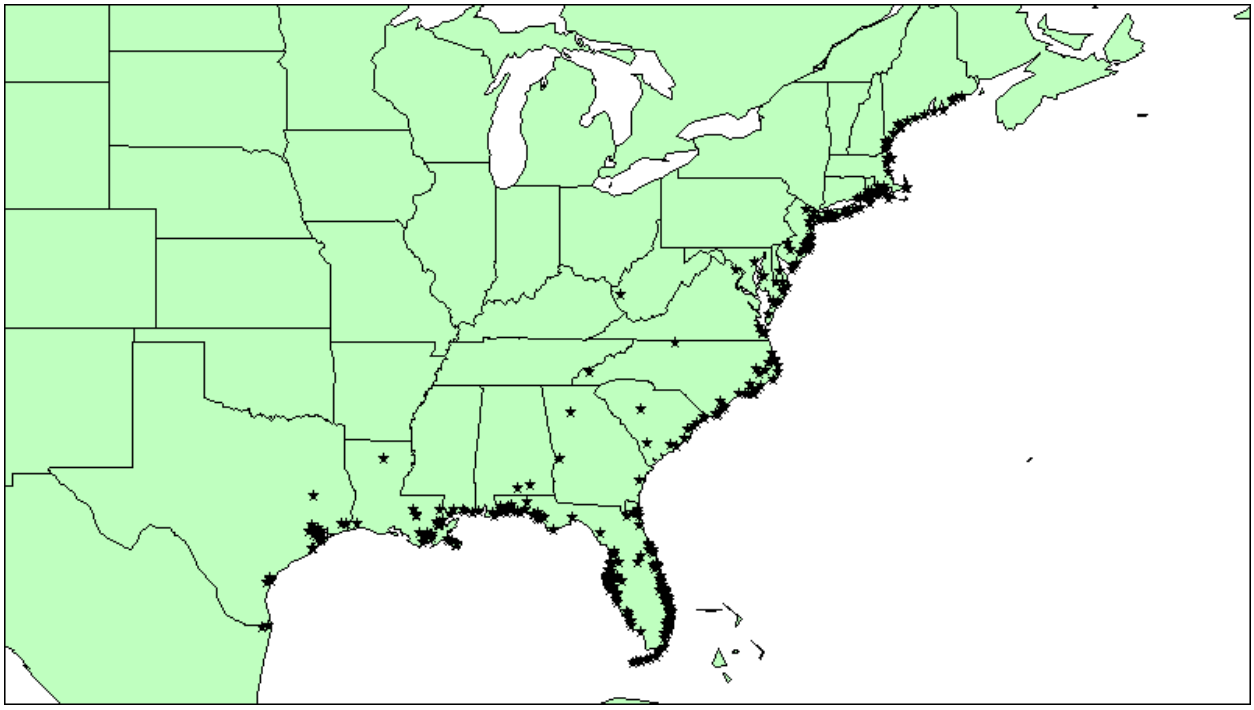


Figure 9.8 Limited Access Permit Holders (Shark, Swordfish and Tunas)



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