Enhancing community and industry opportunities to adapt to area-management strategies and buyback programs: the United States, Northwest Atlantic, sea scallop fishery

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States, Northwest Atlantic, Sea Scallop Fishery

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Executive Summary

In the past ten years, National Standard 8 (NS8) and other federal legislation has increasingly emphasized the need for fisheries management to adequately consider community concerns. This is particularly important for designing management regimes and regulations that consider the potential social and economic consequences. Designing regulations that attempt to minimize the potential adverse social and economic consequences, however, requires that members of the community and industry and interested stakeholders be directly involved in the management and regulatory processes. That is, there must be some type of framework or structure in place that permits some degree of community-based, co-management.

The need for community-based or stakeholder involvement in fisheries management is particularly evident in the U.S. northwest Atlantic sea scallop, Placopecten magellanicus, fishery. From 1983 through 1994, the fishery was managed using age-at-first-capture controls (i.e., restrictions on the number of means per pound that could be landed). In 1994, Amendment 4 was implemented, which dramatically changed the regulatory regime. Management went from primarily restricting output to controlling inputs. The New England Fishery Management Council (NEFMC) imposed restrictions on the number of days at sea a year a vessel could operate, crew size, and gear, and required all vessels to install a vessel tracking system for the purpose of monitoring vessel activity. In 1996, the Sustainable Fisheries Act was implemented, which required that all resources, except those which had special problems, be rebuilt within ten years. By late 1997 and early 1998, it became apparent to the NEFMC that the scallop resource was still relatively low, and the National Marine Fisheries Service (NOAA Fisheries) would fall short of the goal of rebuilding the resource.

It was subsequently determined, however, that because of the large scale closures of some sections of Georges Bank to protect groundfish stocks, the abundance and density of sea scallops had dramatically increased. In 2001, the resource was declared by the National Oceanic and Atmospheric Administration (NOAA) to be fully restored. The NEFMC is, thus, interested in using area management strategies to manage the sea scallop fishery. In addition to area management, the fishery remains regulated by the regulations of Amendment 4. The present full-time, limited access, permit holders are allowed 120 days at sea a year; crew size must be less than or equal to seven; ring size must be 3.5 inches or larger; and the vessel tracking system requirements remain.

Area management, while presently being used, is primarily ad-hoc. That is, there are no formal rules for determining which areas to open and which areas to close. Presently, there are three closed areas off of New England—Closed Area I, Closed Area II, and the Nantucket Lightship Area; these closures are primarily for the purpose of protecting groundfish stocks. Off the mid-Atlantic region, the Hudson Canyon and Virginia Beach areas are closed specifically for the purpose of protecting sea scallops.

Members of the various fishing communities, which have sea scallop vessels or
processing activities, and industry have indicated various concerns about the use of area management. The primary fishing ports, and those that were examined for this study, include New Bedford, Ma., Cape May, N.J., Seaford, Va., and Hampton Roads, Va. Area management creates the potential for “boom and bust” cycles of landings and reduced opportunities to exploit sea scallops. Area management may also result in the loss of some supporting infrastructure if vessels must frequently land at other ports. There are also numerous social concerns about area management, particularly if crew and operators are deployed for long periods of time and must land at other ports. Area management also does not address the potential problems of common-property resources, which include excess capacity, technical inefficiency, and loss of earnings.

Concurrently, the Social Sciences Branch of the Northeast Fisheries Science Center has determined that the present active fleet has the capability to harvest nearly 9.0 million pounds of meats a year more than they are presently harvesting. Prior to 1999, industry had expressed a strong interest in using a federal buyback program to reduce fishing capacity, with the explicit intent of gaining days at sea for the remaining fleet. At that time, industry supported a federally-sponsored buyback; that is, the U.S. government would purchase and dispose of vessels. At the present time, the industry does not support a buyback program; in fact, there is an increasing number of fleet owners who have indicated a preference for quasi-private-property right regimes, such as individual transferable quotas (ITQs).

Industry has indicated that at the present time, they do not support either an industry or publically-financed buyback program for the fishery. They also recognize, however, that as long as the fleet is at its current size, the total allowable days at sea per year will be limited to less than levels viewed by industry as being full-time (e.g., 180-220 days at sea per year). At some point in the future, the industry may desire to support a buyback program. Although buyback programs do reduce harvesting capacity, they are not without problems. Members of industry and other stakeholders have expressed concern that a buyback would reduce employment in the scallop fishery and support industries. There is also concern that a buyback will not really reduce excess harvesting capacity in the sea scallop fishery.

This study was originally proposed to address community and stakeholder concerns about area management and assist in the development of a buyback program to reduce capacity. Since the time this project was approved and the present, the National Marine Fisheries Service has adopted and implemented formal procedures for using an industry buyback program to reduce capacity. These procedures are available from the National Marine Fisheries Service. In general, however, a buyback program is voluntary. If it is to be funded by industry, there must be a referendum in which more than two-thirds majority support the buyback. The buyback may be publically or privately funded, or a combination of the two. A buyback can only be used to reduce capacity in a limited access fishery.

At the present time, industry and stakeholders do not support a buyback program.
Even with the restriction of 120 days at sea per vessel, owners, captains, and crew are experiencing high levels of earnings. Also, the NMFS has established formal guidelines for designing and implementing a buyback program. This study, therefore, concentrates mostly on determining or assessing community and stakeholder concerns about area management and offering ways for the community to assist in the development of area management strategies. In addition, the study offers potential options for the community to adapt to area management strategies. The study also attempted, however, to determine community and industry preferences and support for various buyback programs.

To assess community and stakeholder concerns about area management and buyback programs, the framework of Berkes et al. (2001) was modified and used. Berkes et al. offer a framework that helps incorporate community and industry concerns about fisheries management in small-scale fisheries. Since the framework of Berkes et al. is for small scale fisheries, it was necessary to slightly modify the approach of Berkes et al. Berkes et al. suggest that 13 factors may be important for involving the community in small-scale fisheries management. The thirteen factors are as follows: (1) clearly defined boundaries; (2) clearly defined membership; (3) group cohesion (for example: high homogeneity of gear, kinship, religion, ethnicity, language); (4) participation by those affected or inclusivity; (5) cooperation and leadership at the community level; (6) leadership (by action, example, and direction); (7) empowerment (training and awareness of participants in taking on responsibilities); (8) property rights over the resource that are defined (although collectively held); (9) local organizations with defined membership, a right to exist, that are autonomous from the central government, and are representative of a majority of the resource users of the community; (10) sufficient finances; (11) partnerships and a sense of being a full partner; (12) accountability and transparency in decision-making; and (13) a strong co-management institution for making decisions as well as for managing conflict. Because of the nature of the sea scallop fishery, however, we consider isolation and dependency as two more factors in this study. The framework of Berkes et al. is presented in chapters II and III; it is again discussed in chapter V.

To assess whether or not the factors of Berkes et al. were present, a review of the economic and social factors applicable to the counties and communities was undertaken. Next, numerous interviews with existing and potential stakeholders and community leaders were conducted; the purpose of these interviews was to determine community concerns about area management and buyback programs. Then, several forums were held in the communities to determine additional concerns about buyback programs and area management, and to create an atmosphere for exchange of information about concerns about area management and options for dealing with the potential problems that might be caused by area management and buyback programs.

It became clear early during the project that there was a general lack of concern by members of the community about area management or buybacks, except in New Bedford. For the most part, even municipal officials in New Bedford expressed little or no concern about the potential social and economic ramifications of area management strategies or buybacks. Municipal officials in Cape May appeared to be more concerned about
recreational fishing and tourism rather than commercial fishing. Seaford, Virginia is part of York County, and commercial offshore fishing, while viewed as contributing to the local economy, is not a major concern of municipal officials. This is similarly true for the Hampton Roads area.

Despite the general lack of concern by municipal officials in the four study communities, it was possible to determine, at least, some stakeholder concerns about area management and buyback programs. Furthermore, by maintaining routine contact through interviews and public forums, it was possible to derive some possible ways that would allow communities to better adjust to area management strategies and buyback programs.

In New Bedford, residents indicated a concern that area management, particularly as is presently done, might reduce funding for city services; decrease crew earnings, which would decrease overall economic activity in New Bedford; creates problem for having appropriate gear available; and possibly reduce the authority of captains and crews because of required increased involvement by vessel owners. Other concerns raised included a decline in the value of sea scallops; overcrowding of the harbor; congestion on fishing grounds, when areas were re-opened; possible increased workload on crew; and increased personal and social problems, such as alcoholism. Another concern, but somewhat difficult to directly attribute to area management, is that captains and crew may have to work more to shuck sea scallops; this is because of the superabundance of scallops that may accompany a re-opening of an area, and captains must help with the shucking. In this case, there is a potential safety problem. There also was concern about areas being closed and never re-opened.

Concerns raised by residents of the other three ports were similar, but had different levels of importance. Fishermen from Mid-Atlantic expressed strong concern about long-term closures of New England areas and the shifting of effort from New England vessels to open Mid-Atlantic resource areas. New England fishermen were not strongly concerned about more vessels, including those from Mid-Atlantic ports, operating on New England fishing areas; they did, however, express concern about competition for dock space as a result of increased activities by vessels from the Mid-Atlantic region.

Concerned stakeholders from all four study communities expressed concern about how areas would be selected for closure and re-opening. They were also concerned about the size of areas to be opened and closed. Previous experience with the Georges Bank closures left stakeholders concerned that formerly highly productive areas would be closed. Stakeholders also indicated a concern about re-openings and a possible glut of scallops on the market; in this case, prices could rapidly decline to very low levels. Concern about the timing of openings and closings was also expressed by stakeholders.

A remaining major concern relative to area management was the use of vessel monitoring (or tracking) systems (VMS) for enforcement. It was suggested by several
vessel operators that there was too high a chance for the VMS to malfunction. Several operators indicated that, although not fined, they had been warned by the Coast Guard that there were fishing in a closed area, when in fact, they were not.

Relative to buybacks, there is almost no support for having a buyback program. The industry recognizes that the fleet has excess capacity; this is recognized by the constraints on days at sea, gear, and crew size. For many individuals in the fishery, it is thought that if the fleet needs to be reduced, existing owners can simply purchase and retire vessels without a formal buyback program. Other individuals in the fishery indicated that if there was a need to reduce capacity in the fishery, they would prefer to do it privately to avoid government regulations and government costs of having a buyback. The only concern raised about a buyback in New Bedford was the possibility that it would reduce employment opportunities, and subsequently, have a potentially short-run, negative impact on the local economy. Residents of New Bedford believe that the port has already endured a substantial reduction in fishing capacity because of the various buyback programs previously conducted for groundfish vessels. Several vessel owners in the Mid-Atlantic indicated no support for a formal, government-sponsored buyback, but indicated if there was to be a capacity reduction program, they would prefer it not involve the government.
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Chapter I

Introduction

1.1 The Scallop Fishery and Present Regulatory Regime

In terms of ex-vessel, first-sale, or dockside value, the United States Northwest Atlantic, sea scallop, *Placopecten magellanicus*, has been one of the more important species of the United States. In 1950, the ex-vessel value (in constant 2001 dollar value) equaled $65.8 million; the ex-vessel value in 2001 equaled $175.7 million. In terms of individual species, only four species—brown shrimp ($289.2 million), American lobster ($245.5 million), Walleye Pollock ($230.7 million), and white shrimp ($190.7 million)—had a higher ex-vessel value than sea scallops in 2001. The landed value of sea scallops even exceeded the combined landed value of chum, pink, and sockeye salmon. Landings of sea scallops over time, however, have been highly erratic; annual landings averaged about 21.1 million pounds between 1950 and 2001, but the coefficient of variation was 42.3 percent. Between 1950 and 2001, landings were as low as 6.3 million pounds (1971) and as high as 47.2 million pounds (2001).

Sea scallops are primarily targeted by two gear types—scallop dredge and trawl net. The primary gear, however, is the dredge. There are two basic permit categories for the fishery—general, which is open access, and limited access according to gear type and level of involvement (e.g., full vs. part-time). In 2000, there were 241 active scallop vessels, 35 inactive vessels (existing vessels with permits to allow fishing scallops), and 64 entities with a "Confirmed Documented Permit History" (this is a valid scallop permit that is not currently assigned to a vessel) (New England Fishery Management Council (NEFMC), 2000). There were 1,995 general category permits in 2000. Vessels operate out of ports between Maine and North Carolina. The major ports are New Bedford, Massachusetts; Cape May, New Jersey; Seaford, Virginia; and Hampton Roads, Virginia (Figure 1). Including landings from Wildwood, New Jersey and Newport News, Virginia, which often get included with Cape May, New Jersey and Hampton Roads, Virginia, landings at these ports accounted for 80.1% of total landings of sea scallops between 1990 and 2001.

The fishery has been managed by the New England Fishery Management Council (NEFMC), in collaboration with the South and Mid-Atlantic Fishery Management Councils, since 1982. Initially, the fishery was managed using "age-at-first-capture" restrictions to control the age at entry. In 1989, a limit on entry into the fishery was imposed. By 1993, it was determined by industry, scientific advisers, and members of the NEFMC that restrictions on age at entry were not sufficient to accomplish the goals and objectives of the Fishery Management Plan (FMP). Subsequently, an entirely different suite of regulations were imposed in 1994. These included limits on the number of days at sea a vessel could operate; a restriction that limited crew size to no more than seven
individual; restrictions on the size of rings; a vessel monitoring or tracking system that facilitated the monitoring and reporting of days at sea by scallop vessels; and other restrictions on gear. Presently, the fishery is regulated using the previously discussed regulations and spatial restrictions (i.e., area management).

In 2001, the resource was declared by the National Oceanic and Atmospheric Administration (NOAA) Fisheries or the National Marine Fisheries Service (NMFS) to be fully restored. It has been suggested by fishery researchers that the use of area management, although originally implemented to help rebuild the groundfish resources of Georges Bank, has been partially responsible for the rebuilding of the scallop resource. There is, thus, a desire by the NEFMC to continue to manage the fishery using area closures and openings. Thus far, however, area management has primarily been ad-hoc; that is, there are no formal rules for determining which areas to open and which areas to close. Presently, closed areas are Closed Area I, Closed Area II, the Nantucket Lightship Closed Area, the Hudson Canyon Closed Area, and the Virginia Beach Closed Area (Figure 2). Areas I and II and the Nantucket Lightship area were closed primarily to protect groundfish stocks; the Hudson Canyon and Virginia Beach areas were the only two areas closed to actually protect sea scallops. Amendment 10, which is now under development, specifically seeks to provide formal rules for determining the areas to open or close.

Area management, along with the input controls, are believed to have substantially contributed to recruitment and growth (NEFMC, 2000). Area management, however, may pose particularly difficult problems for industry and communities dependent upon sea scallop landings. First, there is the potential for “boom and bust” cycles of landings and reduced opportunities to exploit sea scallops. Area management may also force vessel operators and crew to fish farther from homeports, which could have significant social implications. Spatial restrictions may also create loss of important infrastructure, such as processing activities; this would particularly be the case if area management forced vessel operators to land at ports other than homeports. In addition, area management does not directly address the potential problems of common-property resources. Simply, it does not instill any semblance of private property rights, such as might be associated with individual transferable quotas or ITQs. The present regime, therefore, does not adequately address problems associated with excess harvesting capacity and over-capitalization (e.g., technical inefficiency, misallocation of resources, and higher than necessary costs of operations).

A recent report by the Social Sciences Branch of the Northeast Fisheries Science Center suggests that just the active permitted dredge fleet has the potential to harvest nearly 9.0 million pounds a year more than is presently being harvest, given the existing regulations. If the inactive vessels, documented permit history holders, and general permits are considered, the potential output of the entire fleet would be considerably higher. The present regulatory regime does not address potential excess capacity and over-capitalization. The present regulatory regime, in fact, imposes underutilization of the capital stock. Although ITQs might solve many of the potential economic problems
caused by excess harvesting capacity and over-capitalization, NOAA fisheries allows the use of "buybacks" or "buyout" programs to reduce excess harvesting capacity and over-capitalization in fisheries.\(^1\) At the present time, there is little support by industry for a buyback program. Prior to the resource being restored, however, industry widely supported the use of buyback programs to rationalize the fleet (reduce fleet size and subsequently improve technical and economic efficiency). In fact, the industry has swayed back and forth on their support of buyback programs; the level of support appears to be inversely related to economic conditions (i.e., there is little support during good times and increased support during bad times).

Buyback programs, unless properly designed, may also create numerous problems for industry and communities dependent upon sea scallops. A buyback program, at least in the short-run, would be expected to increase unemployment in communities dependent upon sea scallop landings. It is also possible that a buyback program may not reduce the level of excess capacity to a level desired by management (Holland et al., 1999). There is also no guarantee that a buyback program will improve technical efficiency in the future; remaining vessel owners may engage in "capital stuffing" (e.g., adding bigger engines or more sophisticated electronics), which might dissipate any efficiency gains that might have been generated by a buyback program. Also, without additional restrictions on entry, a buyback program may not even reduce excess capacity (GAO, 2000). NOAA fisheries, nevertheless, has, at its discretion, the use of buybacks to address problems related to excess capacity. A buyback program, however, is strictly voluntary; it is not mandatory that a vessel owner participate in a buyback program.

1.2 Community-based, Co-management

The use of area management and buyback programs, as well as any regulatory strategy, as possible regulatory regimes to manage the sea scallop fishery trigger or require that National Standard 8 (NS8) of the Magnuson-Stevens Fisheries Conservation and Management Act be considered. National Standard 8 was enacted in 1996 specifically to require that management and regulatory actions consider potentially adverse social and economic consequences. The Standard requires that management measures take into account the importance of fishery resources to fishing communities in order to promote sustained participation of such communities, and to minimize, to the extent practical, the adverse economic impacts on such communities.

In addition, a major initiative of the NOAA Fisheries in the past five years has been to create opportunities for stakeholders to become more active participants of the management and regulatory processes. That is, to facilitate the development of management and regulatory strategies that directly address stakeholder concerns. In fact,\(^1\)

\(^1\)At the time that research was being conducted to support this project, the use of ITQs as a management regime was prohibited. The proposed reauthorized Magnuson-Stevens Fisheries Conservation and Management Act allows the use of ITQs, but only if supported by a majority of industry.
a major priority topic area for Saltonstall-Kennedy grants is the design and development of mechanisms to permit not only greater stakeholder involvement, but also to help stakeholders and communities develop strategies for mitigating the potential adverse effects of management and regulation.

One way to comply with NS8 and create mechanisms for communities to deal with management and regulation is to create sufficient opportunities for stakeholders to directly participate in the management and regulatory process. Involving stakeholders in the process, however, may be quite complicated, especially those individuals potentially affected by management of the sea scallop fishery. The stakeholders tend to be geographically distributed, and many do not even live in the community where scallops are landed and processed (e.g., consider Seafood, Virginia in which no crew member has a resident address in Seafood). In addition, many of the ports where scallops are landed also have landings of other major regulated species (e.g., groundfish in New Bedford). Many stakeholders are, thus, often as much or even more concerned about the implications of managing these other fisheries, which can create a situation in which it appears that the primarily stakeholders of one fishery are not really concerned about that particular fishery. At the present time, management issues related to New England groundfish appear to be dominating the concerns of New Bedford stakeholders. Last, there is the problem of even determining a fishing community, or geographical area, necessary to facilitate stakeholder involvement in the management process; NS8 defines a community as one “which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs including various fishery participants based in such a community.”

Albeit it may be difficult to facilitate stakeholder involvement in the management and regulation of the sea scallop fishery, more recent work has illustrated that co-management and community-based management offer mechanisms to enhance community participation and governance of fisheries. Both of these approaches offer opportunities to directly consider and include local concerns and controls in fisheries management (Jentoft, McCay, and Wilson, 1998; Pinkerton, 198; Jentoft, 198). In contrast, however, McCay (1980) and Wade (1987) have also argued that cooperative and community management may not be used to manage many fisheries, particularly the widely distributed Exclusive Economic Zone (EEZ) type fisheries, which are characteristic of many U.S. fisheries. Wade suggests that for community-based management to be successful, the number of fishers should be relatively small; there must be mutual obligations and ties that bind together the fisheries; the resource must be important to the fishers’ livelihood; policing banned activities must be relatively easy; and the fishery size and boundary should be well defined. McCay contends that the conditions for cooperative or community management cannot exist in most developed fisheries without the potential for exclusion and the development or existence of institutions for setting rules at the local level.

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2 This was determined by examining a database file constructed for the purpose of preparing 1099 statements.
Figure 1. Major Ports of the Sea Scallop Fishery
Figure 2. Areas Presently Closed to Sea Scallop Fishing
Co-management, the situation in which fishers and the regulatory authority cooperate to develop management and regulatory strategies, may, however, offer the potential to improve upon management and regulation. The present council system permitted under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) offers relatively limited opportunities for co-management. Stakeholders may offer comments on proposed regulations during scoping meetings, public hearings, and by letter, and advisory groups may offer input on potential management and regulatory actions. This limited opportunity to provide input about potential management and regulatory strategies has not apparently been sufficient to allow for adequate stakeholder involvement in the management process. In essence, stakeholders either do not perceive they have an adequate opportunity to provide input or are disenfranchised from the management process. The inadequacy of the present management system to allow for increased stakeholder involvement in the management process is partly illustrated by the increasing demand for court relief from the regulations. There is, therefore, a need to better facilitate stakeholder involvement in the management and regulatory process.

1.3 Involving Stakeholders and Related Objectives

In this study, we offer a framework for allowing stakeholders to become more involved in the management and regulation of sea scallops. A major objective of this study is to obtain information that helps communities and stakeholders determine strategies to mitigate the effects that might occur because of area management and buyback programs. Initially, we attempt to obtain a broad perspective and understanding of local community and industry concerns about area management, other forms of fisheries management, and buyback programs. This information is then compiled, synthesized, and distributed to members of the community and other stakeholders. Next, information about industry and community concerns is discussed with stakeholders in both informal and formal meetings; this process permits obtaining information about stakeholder support for both area management strategies and buyback programs and the development of possible strategies to allow communities to respond to various forms of area management and buyback programs.

Four communities are selected for analysis: (1) New Bedford, Massachusetts; (2) Cape May, New Jersey; (3) Seaford, Virginia; and (4) Hampton Roads. These communities were selected because of the relative importance in landings; that is, these four ports are recognized as major sea scallop ports. In addition, the four ports are quite heterogeneous. New Bedford is a port with long established ties to the fishing industry. Cape May has multiple fisheries but is recognized as a major summer resort area. Seaford is in York County, Virginia, which has a mix of urban and rural characteristics and demographics. Hampton Roads is an urban area with a large concentration of government and military employees. None of the communities, except New Bedford, has an infrastructure designed to support commercial fisheries or the interest of the communities in fishery issues.

This report is organized as follows: (1) Chapter II provides a limited discussion of
the theory of community based and co-management of fisheries; (2) Chapter III discusses methodologies for assessing the feasibility of community-based and co-management strategies; (3) Chapter IV provides a description of the sea scallop fishery and the four communities considered in this study; (4) Chapter V presents community concerns about area management strategies and buyback programs; and (5) Chapter VI presents the summary and conclusions of the study.
Chapter II

Community Involvement, Management, and Buybacks

2.1 Definition of Community-Based/Co-Management

In an overview of co-management, Hersoug and Ranes (1997) point out that while the term is used with frequency, the definition is not exact. They state that "some authors seem to presume a legal framework that institutionalizes both autonomous and shared decision-making between the government and industry, and others expand the concept also to less formal agreements that delegate some power to user groups or joint industry-government bodies." Recently, there has been a growing recognition of both concepts as being part of the same body. Even the less formal agreements are seen by researchers as either being in fact recognized by the government, or at least not fully inhibited by government (Acheson 2000).

Sen and Nielsen (1996) have placed the types or degrees of co-management into a spectrum depicted in Figure 3. At the two ends are centralized governmental management and community-based management. Within the central areas are the range of types of co-management, which are differentiated according to varying degrees of participant and community input.

Figure 3. Co-management arrangement spectrum after Sen and Nielsen (1996)
Community-based, co-management is defined by Pomeroy (1998) and Berkes et al (2001) as a form of management, which is distinguished from co-management and community-based management by its mix of horizontal and vertical linkages while retaining the community as its focus. Community-based management focuses on communities and their access to as well as management of resources. Therefore, important aspects of community-based management include community, resources, management, access and control over resource, appropriate and viable organizations, and sufficient technology to use and manage the resources. Overall, community-based management is seen as being people centered and interested in local institutions. While community-based management is sufficient for resources that are not mobile, are limited in geographical extent to the community, and do not export negative impacts from exploitation outside the community, migratory resources or resources of broader geographic scope may require a broader form of management. This broader scale of management would aid in conflict resolution between communities; maintain standards for management that would make regulation more coherent across the range of the resource, and thus, easing compliance requirements for users; and finally should aid in avoiding local excesses of political power (Ostrom 1999).

Co-management is characterized by linkages between a central government authority and either industry or community organizations. This form of management has vertical linkages to the centralized government and is believed to be necessary by some researchers (Wade 19, Pomeroy et al. 2001) for fisheries management because the resources are often not localized, and thus, not amenable to only community-based management.

To overcome the problems of community based management having too many different restrictions and goals over a broader area though, community-based co-management has been seen to both include the communities but to coordinate communities over a larger (regional or ecosystem) level.

2.2 Successful Community-Based Fisheries Management

Co-management has been seen as successful for several fisheries in both developed and developing countries. In developing countries, local fishermen and their communities have taken the impetus to begin fishery management through more traditional means; for example, the Sasi system in Indonesia (Mantjoro 1996), the urchin fishery of St. Lucia (Brown and Pomeroy 1999), and the near shore fisheries of the Philippines described by various ICLARM researchers (Pido et al. 1997, Pomeroy et al. 2001). Examples of Co-management and/or community-based management in developed countries include the local soft clam fisheries of Maine and Massachusetts, the lobster fishery of Maine (Acheson 1989 and 2000), the salmon fisheries of the Pacific Northwest of the United States and in Pacific Canada (Pinkerton 1989 and Notzke1995), the near shore cod fishery of Lofoten (Jentoft and Kristoffersen, 1989), and the Danish fisheries of sole/nephrops and matjes herring fishery in the Kattegat (Nielsen and Vedsmand1999). Some authors have
even considered the efforts undertaken by NMFS and the scallop fishermen to assess resource conditions for the purpose of re-opening the closed areas that have already occurred as another example of community-based co-management if one considers the industry participants to be a community of interest (Bernstein and Judeccello, 2000). Particularly cogent for this study, the original Sea Scallop Fishery Management Plan has a discussion of the presence of management of the scallop fishery in New Bedford. Presumably the reference is to the union's control of days on and off and crew sizes. One could, then, contend that the sea scallop fishery has been an example of at least temporarily successful community-based management.

In general, most of the efforts to manage a fishery using community-based management, co-management, and community-based, co-management have occurred for small scale fisheries or for fisheries in near shore waters. However, Caddy and Cochrane (2001) have suggested a return to older styles of management including area management, seasonal closures, and other methods that can now be monitored through new technologies. In this instance, the communities, while somewhat distant from the fishing grounds, could request assistance for monitoring and enforcing regulations through the central government system while cooperating on the design of the management plans.

2.3 Advantages and Disadvantages of Community/Co-management

While community-based management is seen by some as preferred, there are distinct advantages and disadvantages of siting management at the local level (Pinkerton 1994). The advantages accrue due to inclusion of those being regulated (Acheson and McCay 1987, Pinkerton 1989, Jentoft), and a better fit of management within the varying scales of the biotic system (Ebbin 2002). The disadvantages can be related to more levels of management with which to contend and to redundancy of effort, which may create higher total costs of management if not of participation (Ebbin 2002).

The advantages include increased potential for interaction among stakeholders in the locality; lessened travel costs for fishermen to participate in management decisions; the potential for participation by more stakeholders in the area; and enhanced empowerment (Pinkerton 1994, Pomeroy 1999). Enhanced participation is thought to enhance both legitimacy of the management in the eyes of the regulated as well as to increase levels of compliance (Jentoft, McCay, Acheson, Ostrom 1990, Wade 1987).

Disadvantages of this style of management include the need to have someone locally to provide leadership; the potential for higher costs of management as there are multiple localities that may be involved; and varying management throughout the range of the species, which requires greater knowledge on the part of the fishermen who fish throughout the range. Ebbin (2001) determined that for community-based management of the U.S. Pacific salmon fishery, local decision-makers had to demonstrate that they had the same scientific credibility and knowledge as that of the more centralized authority (i.e., the Pacific Fishery Management Council).
While countering some of the disadvantages of co-management or community-based management, management focused at the top, or federal level, is seen as having disadvantages in trying to place a "cookie cutter" approach to the fishery throughout the range, as well as the potential to neglect community concerns. In addition, there are travel and participation costs that are typically higher than the costs associated with management at the local level. Co-management, with management activities shared between the local and federal level, is thought to include more of the concerns of the fishery participants and communities (under the definition of use at the time) while retaining some consistency of management throughout the range of the fishery.

A particularly vexing problem for implementing community-based co-management is determining the appropriate level of "community." In many instances in developed countries, the "community" is often thought to be represented by fisheries interests that may be a local board or union, but does not represent the community of place. Schreiber (2001) quite correctly points out that in determining the community to be only those who participate in the fishery, other stakeholders, with their ideas and concerns, are excluded or diluted by their not formally being part of the community. Jentoft (2000) and Schreiber (2001) suggest that the "community" be one of place that is affected by fishing and area management. Schreiber (2001) finds that communities under present co-management of fisheries in Canada are "frustrated by government claims that advisory boards representing the current license holders are acceptable forms of co-management." Jentoft suggests that while healthy stocks of fish are necessary for healthy fisheries, so too are healthy communities. Jentoft means not just the industry, but industry and its links into the broader community through family and others who both support and constrain behaviors related to fisheries.

In the United States, there is currently an effort to determine what is a "fishing community." The regulatory definition for a fishing community is as follows (NMFS 2001): the fishing community must consist of a geographic location; be comprised of fishermen (operators and crew), vessel owners and United States processors; be substantially dependent on harvesting or processing of fisheries resources to meet social and economic needs; and/or be substantially engaged in the harvesting or processing of fisheries resources to meet social and economic needs.

According to this regulation, fishing communities are communities of place; they are communities of place made up of fishermen, service providers, American processors, and their families. This definition is thought by several researchers to be inadequate since it defines the community based on geographical location, and it does not include factors such as area of residence, or other communities dependent upon the fishery or economic activities external to the port which may still have a reliance upon fisheries. For example, Hall-Arber (2000) found that the fisheries ports in New Hampshire were not the sole extent of the community as the fish that were provided from those ports aided in making tourist activities more pleasurable for places like Hampton Beach. To provide a definition of community which seems to encompass the community of place, as well as the horizontal and vertical linkages needed to support a community, perhaps the definition of
community offered by Warren (1963) provides the type of community to consider that is commensurate with natural resource communities. Warren (1963:pp) defines community as “that combination of social units and systems that perform the major social functions of locality relevance.” In other words, community means the organization of social activities to afford people daily local access to those broad areas of activity that are necessary in day-to-day living.” The functions with locality relevance are as follows: (1) production-distribution-consumption, (2) socialization, (3) social control, (4) social participation, and (5) mutual support. Warren further recognizes that these functions, while they have locality relevance, are not necessarily all undertaken at the local level. To function in modern systems, a community must be connected outside the locality. In this definition, function is at least as important as geographical location and the associated boundaries.

Pido et al (1997) have suggested a framework for considering biology, economics, intra- and extra-community considerations, and exogenous factors into fishery management. This framework is depicted in Figure 4. This model seems to link the factors of community concern with a definition of community similar to that of Warren (1969) through the description of both horizontal and vertical components of community, which may be beneficial in considering who is affected and the intensity of the effects.

2.4 Community Structure and Management

During the past 20 years, numerous studies have shown that there are specific requirements for the development of successful co-management. Successful co-management is a management system that maintains resource availability, is long-term, and benefits participants. Authors who have studied these issues include Ostrom (1991), Wade (1987), Pomeroy (2001, 1999), and McCay (1980, 1989). Ostrom and Wade analyze existing systems of co-management and determine what factors are important in the development and maintenance of those co-management systems. McCay and Pomeroy take a somewhat different approach in that they attempt to apply the principles of co-management into current settings and predict where co-management may be used in the future as well as contributing to the theoretical underpinnings for this management method through the study of extant co-management systems.

Ostrom (1991, 1999) focused on both economic and social institutions, which are important for success of co-management. She found that communities can and do generate appropriate institutions for managing common pool resources, whether terrestrial or aquatic under certain conditions. Conditions for successful co-management identified by Ostrom include the following: (1) clearly defined boundaries (both of membership/appropriators/users, and borders of the resource); (2) rules that are appropriate to local conditions with respect to the removal of resources and of development of technology for distribution (in the case of irrigation projects); (3) collective choice arrangements such that most participants in the resource removal are also participants in rule making; (4) appropriate monitoring of condition of the resource and user behavior either by the users or by those accountable to the users; (5) graduated sanctions for those who violate the rules, which may be assessed by either other resource
users or by an authority responsible to the resource users; (6) conflict resolution mechanisms, which are rapidly available and low in cost to resolve conflicts either between users or between users and officials; (7) rights to organize, or at least a lack of challenge to the organization by external government authorities; and (8) for resources that are a part of larger systems, nested enterprises with multiple layers of appropriation, provision, monitoring, enforcement, conflict resolution and governance.

Figure 4. Factors for Assessing Community-based/Co-management (Pido et al. 1997)

In contrast, Wade argued that marine fisheries were not amenable to community-based or co-management, due, in large part, to a lack of long term interaction of the participants and problems regarding monitoring compliance. While this may have been correct at the time of Wade's work, technological developments have occurred to enhance monitoring, and limited access has delineated a recognizable group of participants who have interacted for a longer period of time. In Wade's (1987) model, the greater possibility of successful co-management occurs if six factors are met. The six factors are much like those factors delineated by Ostrom in that they relate to boundary definition, technology, the relationship between resources and the user group, characteristics of the user group itself, noticeability, and a relationship between users and the state. Somewhat different than Ostrom, though, is the additional emphasis placed on the size and geographical distribution of the user group. In addition, within the groups there are interactive characteristics such as a history of working out common problems, a longer-term set of
mutual obligations, and shared values displayed through a setting where joint rules and
punishment are adjudicated.

McCay participated in the attempt to generate a community-based management
project for a clam spawner sanctuary in New Jersey. The crucial factor in instigating
community-based management for this situation was the recognition of a problem, and the
need to "do something." The attempt met with some limited success; yet, the less
successful elements led to a better understanding of issues which may either enhance or
limit co-management. In this instance, it appeared that while the state authorities were
supportive of co-management, there was little, if any, commitment toward undertaking the
physical labor involved in replanting spawners to the sanctuary area by the fishery
authority's employees. This caused a level of discouragement among the local participants
who felt that they were stuck with the 'grunt work,' and eventually led toward the end of
the project. This points out a need for a level of actual commitment (not just verbal)
among both sides of the co-management process, which is further emphasized by other
authors in subsequent efforts (Pomeroy and Berkes 1997, Jentoft 2000).

Pomeroy and several other researchers associated with ICLARM have been
working toward generating co-management agreements and processes in Asia, Africa, and
the Caribbean. In these efforts, co-management strategies have been designed, and are
presently being undertaken in the Philippines, Malaysia, Indonesia, Bangladesh, Benin,
Cote d'Ivoire, Malawi, Mozambique, Senegal, South Africa, Zambia, and Zimbabwe
(ICLARM: http://www.co-management.org/). Pomeroy and others (Pomeroy and
Katon and Harkes 2001, Berkes et al. 2001) offer both the factors to consider for
successful community-based co-management, and a process for developing community-
based co-management for small scale fisheries.

Berkes et al. (2001) and Pomeroy et al. (2001) provide a list of factors, which
should be considered for successful community-based, co-management of fisheries.
Among the factors, there are three levels of context considered: the supracommunity level,
the community level, and the household/individual level.

At the supracommunity level, two factors are advocated as being important-- the
legal right to organize and external agents. The legal right to organize is necessary to
confer authority to the community, and is provided by the government through enabling
legislation. External agents may be positive or negative toward the development of
community-based/co-management strategies as NGOs, educational institutions, and others
could assist in the development of problem definition, advising, provision of expertise, aid
in conflict resolution, and advocacy of appropriate policies. However, external agents are
also capable of disrupting the process if the external groups' demands are distracting to
coordination by taking up time in litigation of decisions or of the co-management
organization or by offering too many options, which could slow decision-making.

At the community level, there are thirteen factors which consider the physical and
social environment. Of these, not all thirteen need to be present, but the more that are, the greater the likelihood of success. The thirteen factors are as follows: (1) clearly defined boundaries; (2) clearly defined membership; (3) group cohesion (for example: high homogeneity of gear, kinship, religion, ethnicity, language); (4) participation by those affected or inclusivity; (5) cooperation and leadership at the community level; (6) leadership (by action, example, and direction); (7) empowerment (training and awareness of participants in taking on responsibilities); (8) property rights over the resource that are defined (although collectively held); (9) local organizations with defined membership, a right to exist, that are autonomous from the central government, and are representative of a majority of the resource users of the community; (10) sufficient finances; (11) partnerships and a sense of being a full partner; (12) accountability and transparency in decision-making; and (13) a strong co-management institution for making decisions as well as for managing conflict.

At the individual level, two factors are perceived as being important for the success of co-management. These factors include an individual incentive structure that persuades people to participate, and the presence of credible rules with effective and equitable enforcement.

While the factors considered by Berkes et al. (2001) are generally applicable to the development of community-based co-management, some additional factors should be considered for large-scale fisheries in the eastern United States, particularly the U.S. Northwest Atlantic sea scallop fishery. One factor that is pre-supposed or assumed by Berkes et al. is some measure of isolation of the fishing community. Another study by Berkes (1990) discusses isolation as a factor in developing community-based management. Isolation may be contributory to community cohesiveness as community members cannot escape one another and local concerns. Additionally, isolation may contribute to decreasing external agents' negative activities due to less visibility.

Two remaining important factors are social and economic dependency. Social dependency refers to a focus of social interactions (e.g., festivals and monuments). Economic dependency refers to the relative economic importance of fisheries or other industries to the overall economy (e.g., ratio of fisheries related employment to total employment in a community).

Finally, there is a factor which comes from the process description of Berkes et al. It has to do with timing and a precipitating event or situation. In addition to the factors perceived as important for successful community-based/co-management, Pomeroy (1999) and Berkes et al. (2001) offer a process for community-centered fishery co-management that consists of three phases: (1) the pre-implementation phase, (2) the implementation phase, and (3) the post-implementation phase. In the pre-implementation phase, the problem is recognized; there is open discussion and consensus building within the community, and a plan of action is devised. The community then seeks assistance and opens discussions with the government, NGOs or donors as is appropriate, and the project planning begins and institutional linkages are developed. Therefore, again implicit, is the
need for a problem that locals perceive as requiring action.

2.5 Community-based Support for Buyback Programs

In addition to the objective of helping communities develop ways to cope with area management strategies, the current research was to also ascertain the feasibility of industry supporting a buyback program for sea scallop vessels, and to help communities design an appropriate buyback program. At the time the research was proposed, there was very strong industry support for a government funded buyback; there was only minimal support for an industry funded buyback. Since 1999, however, vessel owners, operators, and crew have enjoyed very good earnings. They no longer support a buyback program of any type. Conversations with numerous vessel owners, in fact, suggests that most owners would be unwilling to see their vessel, except at an extremely high price. There is also little or no support for a buyback program in the scallop fishery at the community level. Some vessel owners have even indicated that they might be willing to buy another individual’s vessel and scrap it to reduce the harvesting capacity of the fleet.

There has been only minimal work done on the social aspects of buybacks. Most of the work on buybacks has focused on the underlying economic aspects or conditions to justify a buyback program. Ecotrust (2002) prepared a relatively comprehensive report on economic aspects of potential buyback programs for the Pacific groundfish fishery. Holland et al. published an overview document, which focused on whether or not buyback programs work; Holland et al. also describe some of situations, at least in an economic sense, for which a buyback program might be viewed as being successful. Documents on buybacks as subsidies were prepared by the Congressional Research Service (Read and Buck 1997) and the World Wildlife Fund (1997). In 1999, the Federal Fisheries Investment Task Force provided a report to Congress, which discussed capacity, overcapitalization, subsidies, buyback programs, and other programs.

In the Ecotrust report, communities were described as being more than locations of economic activity. The authors discussed the fisheries and provided important aspects of social cohesion in the coastal communities examined. Despite the recognition of fishing activity as having social value, the majority of the report, due in large part to a lack of both data and appropriate models, focused upon economic effects being unevenly distributed among the communities. This was done using geographic information systems analysis considering home ports and area fished. Ecotrust then compared income impacts before and after the closure of the shelf and displayed differential effects at different ports.

Most of the reports on buyback programs appear to view buybacks as predominantly disaster relief, regardless of whether or not the disaster is due to environmental changes or changes due to redefinition of resource availability through court decision. When the alternative is to go broke or to gain something, the industry participants prefer to gain something. In the case of buybacks, the greatest benefit falls to those who sell their vessels (Holland et al. 1999). Further, the authors recognize that the buyback program serves to redistribute income and access to the fishery. An observer
could, thus, expect that if the political and/or economic power of those who benefit after the redistribution is sufficient, there would be greater industry support.

Holland et al. (1999) also discuss the questions of equity with regard to buybacks and the targeting of vessels for removal. Under the typical system in which the low bidders are removed, the low bidder usually has some underlying reason for wanting to leave such as marginal success, and/or a desire to retire from fishing. Other factors that might increase participation are the possibility that a license/permit only allows part-time or occasional participation or that permit is not being used. If high capacity vessels are targeted, the greatest benefits accrue to the most active fishermen. Finally, some programs are targeted to those in specific demographic communities, so only certain people may be allowed to participate and benefit.

In the United States, buybacks must be voluntary according to provisions of the MSFCMA. In addition, the National Marine Fisheries Service has developed very detailed requirements and specifications for implementing and conducting buyback programs; these are detailed in Section 312(b) of the MSFCMA. A buyback program may be funded using either public or private-sector monies; if the industry is to pay for a buyback, two-thirds of the individuals participating in the referendum must approve the buyback program. Buyback programs have been used to reduce fishing capacity in the U.S. Northwest Atlantic groundfish fishery, the Bering sea groundfish fishery, and the Washington State salmon fishery.

Community and industry support for a buyback is viewed as critical for a successful buyback program. It is quite difficult, however, to determine community and industry support for a buyback prior to the implementation of a buyback program. Consideration of what may induce a person to sell back the vessel and/or permit may be used as a proxy for gauging community or industry support of buybacks. Holland et al. (1999) describes several situations which may induce a boat owner or permit holder to participate in a buyback. Under the typical system of low bidders being removed, usually the low bidder has some underlying reason for wanting to leave such as poor to marginal success as a fisherman, or a desire to retire from fishing. Another reason that may induce a person to participate in a buyback is the possibility that a license/permit only allows very limited participation or for some reason the permit is not used. If that occurs, the permit holder may gain more income from the sale than through the use of the permit.

Determining which vessels and/or permit holders should be targeted in a buyback program may be based on other objectives. One example is a buyback program that targets removal of high capacity vessels. Under this scheme, the fisherman who has been the most active if he owns the boat, or the vessel owner/permit holder who has vessels with the highest capacity have the potential to gain the greatest benefit. Europe had a program that targeted vessel owners near retirement age. Unfortunately, this program required changing the criteria because nearly all the fishermen of retirement age had left the fishery.
Holland et al. also focus on the issue of equity. Holland et al. offer that if fishery participants perceive that the distribution is equitable and that they will benefit from either selling the vessel/permit or from the redistributive aspect of the buyback, then a greater potential exists for community support. Holland et al. (1999) also note that industry tends to support buybacks when a high percentage of the costs covered by government and current costs from the remaining fishermen are low to non-existent, such as coming from prior license fees.

Obtaining industry support for a buyback program, however, is but one aspect of implementing a successful buyback program. It has recently been shown by Walden et al. (2002) that it is also important to have some information on the level of capacity being reduced; a buyback program is but one of many possible capacity reduction programs. Using estimates of the fishing capacity of New England groundfish vessels, Walden et al. (2002) demonstrated that the New England groundfish buyback program did not reduce fishing capacity at least cost. Walden et al. concluded that the buyback program reduced capacity by only 4.8% at a cost of $23.0 million; it was believed by NMFS that capacity was reduced by 20%. 


Chapter III

Methodology for Assessing the Feasibility Of Community-Based/Co-management Strategies

3.1 Overview of Study Objectives and Methodology

This study has three primary objectives: (1) determine the level of community support for area management, and the potential adjustments that could be made by industry or members of the community to better deal with area management; (2) ascertain industry and community support for buybacks, the preferred method for funding a buyback, and the factors that should be considered in developing a buyback strategy; and (3) develop options to better incorporate community and industry concerns in fishery management and ways to allow the community and industry to adapt to fishery management.

The first question is addressed by using a method similar to that used by NMFS for social impact assessment. Descriptions of the communities and the fishery are prepared to develop or establish a baseline; the descriptions include a wide array of social and economic information. In addition, the descriptions include measures of economic diversification and location quotient indices for the various counties. These are provided to determine the dependency of the counties on the various industries and extent of diversification. The diversification indices and location quotients, however, were restricted to the counties; data necessary for developing the indices and location quotients at the port or community level could not be readily obtained. Next, the effects of the current management regime, which is expected to be expanded and codified through Amendment 10, are determined and described. Effects of area management are expected to be similar to those of the ad hoc management, which has included closures and re-openings.

The information used for the description of the potential effects of the existing ad hoc area management comes from a number of sources, including interviews and meetings where fishery participants described the effects of area closures, and through comparison of fishing patterns before, during, and after the closure. The fishing patterns were determined by GIS analysis plotting the three digit areas fished for the port of landing. An additional measure of effects is provided in graphing the landings by port for the time period before and during closures as well as for the period of the selective re-openings.

Between 1994 and 1998, buybacks were considered a potential solution by industry members for overcapitalization and excess capacity. During these years, the regulatory regime dramatically changed and participants in the fishery were stressed by a downturn in scallop catches overall, and the closure of areas that were historically very productive for
New England fishers. Information on the community and industry support for buybacks and preferred criteria for type of buyback was gathered through interviews and participant observation at meetings.

Finally, community and industry concerns were determined by interviewing fishery participants, suppliers, family members, and local officials. In part, this report is intended to provide documentary evidence of the concerns so that those concerns may be included in discussions of area management. In addition, recommendations for additional ways that communities and industry can share information and concerns in fishery management decision-making are provided in this report.

3.2 Background Information - Community and Fishery Descriptions

To provide background on the fishery and the communities, as well as to set the stage for determining industry and community concerns, a description of the fishery and the communities is developed using information obtained from the U.S. Census Bureau, National Marine Fisheries Service, Bureau of Labor Statistics, Bureau of Economic Analysis, the various counties, and informal interviews with members of industry and the communities. Three levels of community are described for each port. The first is the county, the second the locality (city or town), and finally the “fishing community.” These levels of community were selected in light of the definition of community espoused by Warren (1963), observed behaviors, and knowledge of regulatory purview.

The county captures much of the economic activity for the port and fishing community. This meets the emphasis on production, distribution, and consumption of Warren. For example, in New Bedford there are few shopping opportunities beyond the provision of fishing supplies; shopping for grub (groceries), clothing, and household supplies occurs in Dartmouth or Fairhaven.

The locality is also important as the cities and towns provide support for activities and constrain behavior through several regulatory or funding activities. Constraints on behavior at the city level (social control) is exercised through land use controls such as zoning and local laws. Three of the localities also provide support for the fishery through funding low interest loans, provision of port services, or provision of social services specifically for the fishery participants.

Finally, the “fishing community” is defined as a sub-community of interest based upon employment that is focused geographically at the port. This final level of community is important as the interactions of fishing community members constrain behaviors and provide mutual support, in addition to providing socialization into of fishery participants.

In addition to obtaining data from previously listed sources, addition data for describing the fisheries and communities were obtained from a number of sources. Among those sources are reports on the fishing communities and their histories, local publications, planning documents for the localities, the 2000 Census data on the localities,
participant observation in fishery management meetings, community meetings, and in the community, unstructured interviews, and community forums held in New Bedford and Cape May. Because of the proximity of researchers to Seaford and Hampton Roads, information could be obtained more directly from members of industry and the community without having to hold a public forum.

Information on the characteristics of the respective fishing communities was primarily obtained from McCay and Cieri's (2000) Fishing ports of the Mid-Atlantic, Hall-Arber et al.'s New England Fishing Communities, and the 2000 SAFE Report. In addition to the fishing community reports, published local histories provided historical data. Local publications, mainly those intended for visitor information or for relocation into the communities, were also used to gain a sense of the localities and their surroundings. In addition, planning documents from the localities were reviewed to determine what land uses were allowed proximate to the port areas, and to serve as a proxy for determining the localities' long term interest in fishing. The 2000 Census data were used for the locality and the county level to provide basic information on employment, ethnicity, population, and other demographic data.

Participant observation at fishery management meetings, at local meetings, and in the communities was used to gain information on fishery and local concerns and for triangulation. Participant observation at fishery management meetings occurred intermittently in the two year period of calendar years between 2000 and 2002. Community meetings were mainly in New Bedford as it was the locality with the greatest interest in fishery management, and those meetings were held in 2001 and 2002. In addition, participant observation and informal interviews were conducted during two three-week periods in each distant community. The various time periods during which interviews were held, along with community forums, were January 2001 and June of 2002 for New Bedford, and February-March 2001 and August 2002 for Cape May. Discussions with members of industry and Seaford and Hampton Roads communities were frequently conducted over the two year study period. Unstructured interviews were used to gain additional data on fishery and local concerns regarding management as well as to triangulate on previously collected data. Finally, to obtain additional data on community concerns and industry concerns, a fishing community forum on area management for sea scallops was held in New Bedford and Cape May.

A major objective of this study was to develop options to better enable community and industry concerns to be incorporated into fisheries management, and to determine potential options that permit the community and industry to adapt or respond to fishery management and regulation. Berkes et al. (2001), along with the modifications discussed in Chapter II, perhaps provides the most appropriate framework for facilitating industry and community involvement in the management process. This theory is appropriate as the question revolves around determining industry and community concerns and preferences, and then, including those concerns and preferences into the management process.

As discussed in Chapter II, community-based co-management can fall within a
wide spectrum of arrangements. At the present time, the management system for U.S. fisheries is usually categorized as consultative under the spectrum of Sen and Nielsen (1996). Some fisheries in U.S. waters, such as the surfclam/ocean quahog and Alaskan sablefish fisheries, are managed under ITQ, which is a strong community-based management strategy. Other fisheries may be managed through co-management; for example, the Cook Inlet Beluga Whale fishery is managed by a co-management agreement for subsistence of Alaska Native peoples (NMFS 2000). In contrast, the sea scallop fishery is managed under the typical council form of management, and therefore, its management is considered to be consultative.

The usual participants in the management process for sea scallops include the council members, the sea scallop advisory committee, the plan development team, and a limited number of individuals who comment at meetings of the New England Fishery Management Council or at the scoping meetings for management strategies. While any interested citizen is welcome to comment at the council meetings during the specific time for public comment, seldom do members of the general public or most participants in the fishery attend the meetings. Furthermore, a number of fishery participants have expressed concern that their comments tend to be discounted. This perception has been noted for fishery participants in other areas and has been documented by McCay and Wilson (1998) for the Mid-Atlantic Council.

To add community involvement at the level of consultative co-management, it was necessary to obtain information from a broader group of stakeholders than those who typically participate in the fishery management process. While this only slightly broadens the community as participation was limited to providing information and preferences for management, it, nevertheless, enlarges the community beyond those who normally attend meetings. Expanding the community beyond those individuals who normally attend various council meetings permitted obtaining information from more stakeholders or members of the community and industry. The community was subsequently expanded to include gear and service providers, captains and crew, fishermen from other fisheries (particularly lobster fishermen), lumpers, a dock foreman, city or county officials, and fishing family members; all of whom were interviewed during the study period to determine their concerns and preferences relative to area management and buyback programs.

Although the description and characterization of the industry and communities is critical for implementing community-based and co-management strategies, implementation requires considerably more work. This study was only able to undertake the assessment of the feasibility of community-based co-management under current conditions, and thus, under the process described by Berkes et al. (2001), ends at the beginning of their implementation phase. Recommendations are offered in this report, however, for additional ways to offer input into the management process and for enhanced two-way communication between communities and management agencies.

Initially, the project sought to help communities develop strategies for mitigating
the potential detrimental impacts of area management and buybacks. It soon became apparent, however, that issues related to the New England groundfish fishery were dominating the concerns of industry and members of the community. Moreover, opening of parts of Georges bank in 1998 to scallop fishing and enhanced recruitment and growth in other areas resulted in highly productive years for industry between 1999 and 2002, and thus, the industry and community did not perceive significant problems associated with area management and buyback programs. In fact, by 2001, industry indicated that they had no interest at all in a buyback program; industry did, however, express an interest in developing alternative regulatory strategies (e.g., individual transferable quotas).

3.3 Application of the Methods to the Theory of Berkes et al. (2001)

To assess the feasibility of community-based/co-management strategies, ethnographic methods were employed. As noted by Denzin and Lincoln (2000), “(q)ualitative research is inherently multi-method in focus.” Therefore, several ethnographic methods were selected to address the questions regarding factors for community-based/co-management as well as questions of the effect of prior area management and projections of future effects.

Overall, ethnographic methods were selected because at the outset of this study, the goals were to qualitatively assess the social and economic effects of area management on the four fishing communities. This information was to be returned to the community to allow the communities to undertake adaptive management in response to the change brought about by area management. With increased research, it became apparent that the inclusion of community concerns in management and allowing the communities to adapt to management fell into the realm of community-based/co-management. Additionally, community-based/co-management is unique in natural resource management in that it stems from social theory, and therefore, ethnographic methods for assessing the potential feasibility of co-/community-based management appeared most appropriate in light of the need to discover if the factors were at the appropriate stage of development.

To assess the potential for development of community-based/co-management, the framework of Berkes et al. (2001) was selected as the baseline framework as the authors have expertise in both the theory and application of community-based co-management. Of particular interest are the multiple levels of factors relating to the scale of participation, much like the community definition used by Warren (1963). However, in Berkes et al. ’s text there is a focus on small-scale communities. Implicit in the work on small-scale fisheries is both some measure of community isolation and a reasonably high level of dependency (Berkes et al. 2001:7-9). These must be, therefore, additional factors to include in light of the sea scallop fishery’s large scale nature and in light of the differences in the United States geography, economic, and social systems. These measures cannot be presumed for the United States or for large scale fisheries, so they are directly addressed in this study. In addition, the question of community definition most appropriately fall under the community level factors, and is included among those factors. Finally, with regard to the supracommunity factors, the conditions described by Pido et al linking environmental
and technological factors to community management are included.

The framework of Berkes et al. classify factors important for implementing community-based, co-management into three categories: the supracommunity level, the community level and the individual level.

3.2.1 Supracommunity Factors

The supracommunity factors described by Berkes et al. are the legal right to organize and external agents. In addition to these factors, there are environmental and technological factors relating to the fishery, which must also be considered in developing community-based, co-management.

The legal right to organize, or possibly more properly to have management authority recognized, is undertaken by the more central government’s level, typically through enabling legislation. In the instance of the United States, the authority to manage fisheries is through the MSFCMA, which contains provisions for including community concerns with regard to sustained participation in fisheries and minimizing economic effects subservient to the concerns of sustainable fisheries. There are provisions, however, for highly dependent communities to be participants through community development quotas, particularly for Alaskan fisheries. Other allocation of fishing regulatory authority is handled through the Councils, and the primary responsibility for the sea scallop fishery is held by the New England Fishery Management Council.

External agents dealing with the sea scallop fishery include the academic and research institutions that study the various communities, and may aid in provision of fishery data for determining stock levels. Also, there are a number of NGOs that are now participating in the fishery management process, both as meeting participants and as litigants in court cases; the NGOs, when appropriate, are identified later in this report.

Environmental factors that are important are those related to scallops themselves and physical factors that have enhanced the potential for management. Scallops are possibly amenable to both area and community-based co-management in that the organisms themselves are semi-sedentary, and are found in a band between the intertidal area and approximately 50 fathoms (300 ft. or approximately 100 m.). This area, while larger than the area observable from shore, is still smaller than the entire U. S. EEZ between Cape Hatteras and the Hague Line. Further, there are a limited number of locations where the fishing ports receive large quantities of scallops; there is, thus, the potential that enforcement may be focused through those communities.

Technological factors that seem important with regard to the sea scallop fishery include those that focus upon the boats, the areas that they can fish, the areas that typically are fished, the gear used, and newer monitoring technology that aids in tracking vessels.

3.2.2 Community Level Factors
At the community level, a matrix is offered for the port city (county for Seaford, VA). This level was selected as most appropriate due to the following considerations. The lowest level of jurisdiction has a number of powers delegated under state laws, either through the Dillon Rule or Home Rule. The Dillon Rule states that localities are allocated their rule making and enforcement capability by enabling legislation at the state level. Home Rule localities tend to pre-date statehood and the city/town is allowed somewhat greater freedom in regulating local activities.

Local governments regulate land uses within their boundaries, and thus, control both the type and intensity of uses, and the location of various uses by class. This level of control determines where, or even if, ports and harbors may have access to both land and water resources needed.

In addition to controlling land use, local governments may also provide specific services for the fishing industry. In the interest of job creation or job retention, as well as other economic development factors such as maintaining the localities' tax bases, local government may appropriate funds or may apply for and administer grants. These grants and appropriations may be used to provide low interest loans; to provide infrastructure if the locality determines that the infrastructure is needed and is sufficiently beneficial to the community as a whole or may be used for tax incentive purposes to induce development.

3.4 Community Indicators

H. Russell Bernard (1995), in a description of the social science method, discussed the need for selecting indicators for various behaviors. To assess the communities' capabilities for undertaking community-based co-management, the indicators, which are subsequently discussed, were selected to offer qualitative levels of the factors determined by Berkes et al. (2001) to be important in the development of successful community-based co-management. Also, as discussed in Chapter II, two additional factors should be taken into consideration to take into account implied characteristics of small-scale fishing communities. For those factors of isolation and dependency, qualitative and quantitative measures of those factors are further developed and considered.

Clearly defined boundaries are determined by the description of area fished in interviews and through mapping of area fished from the period of 1990 to 2001. The mapping was done by community of landing with area fished being the three digit statistical area as noted in the vessel trip reports. Data were provided by NMFS. The first three years of data came from dealer weigh-out information; the remaining data from logbook data. Areas fished were mapped by three digit statistical areas to use areas commensurate with those described as important in preceding NEFMC framework documents.

Clearly defined membership is determined by descriptions of memberships of various organizations and by area of residence of fishery participants as determined from interviews. A further measure of clearly defined membership is a key that local people use
to determine if someone is a fisherman locally.

*Group cohesion* has several indicators. The first is a measure that has been emphasized in recent documents, the presence of a fisherman's hangout. The fisherman's hangout provides a locale for socializing and exchanging information that should enhance group cohesion. The location of the fisherman's hangout is determined through interview and participant-observation. Less tangible measures of group cohesion include the discussion of factions in the fishery gained from interviews and participant-observation in meetings and in the communities. Finally, to assess group cohesion at the city or town level, content analysis of local publications and newspapers for the community was used to determine if the community self-describes as a fishing community, and an inventory of services and structures provided for fisheries by the local government was used to determine group cohesion.

*Cooperation and leadership* at the community level may be indicated by the presence of a fisherman's monument and the existence of local fisheries organizations, which in the past or present participate in fisheries assistance and management. The organizations can be either sponsored at the local or industry level.

*Leadership* indicators consist of recognition of a person or group within the community as a fishery leader or by participation and representation at the NEFMC meetings. Information used to determine leadership was obtained from participant observation at meetings, interviews, and from NEFMC committee lists.

*Empowerment* indicators include participation in research, a positive view that users' and communities' voices are heard at Council meetings, and through participation in legal actions related to fishery management. Data on these factors were obtained through interviews, participant-observation, review of relevant websites on fisheries news, and review of newspaper articles.

*Property rights* over the resource are determined by review of the fisheries management documents. The indicator in specific allocation regulations.

*Appropriate local organizations* are indicated by the presence of local organizations that meet the qualifications of clearly defined membership, legal right to exist, are autonomous from NMFS and NEFMC, and represent a large proportion of fishermen in the community. Data on this indicator were obtained from interviews and participant-observation.

*Adequate financial resources* are indicated by membership or contributor funding as discovered through interviews.

*Partnership and a partner sense* of ownership of the co-management process is indicated by participation in the management process, and by a sense that industry and community concerns are listened to as well as being seen as having value. Information for
this indicator was collected during participant-observation at local meetings and council meetings and through interviews.

**Accountability and transparency** indicators consist of meetings open to a large proportion of membership or contributors for the local organizations or city agencies related to fishing. Data for these indicators was gathered from interviews and a review of local management processes available in local documents.

**Strong co-management** organizations are indicated by defined mechanisms for conflict resolution for conflict between user groups, between user groups and the community, and between user groups and the government. Information on this indicator may be obtained by reviewing existing co-management agreements, which in this case are absent for the sea scallop fishery.

Community isolation is indicated by distance from major cities, a lack of interstate highway connections, and a lack of railway connections. An additional indicator of a lack of isolation is recognition of the city/town/county as part of a metropolitan statistical area by U. S. Bureau of Census. The Census definitions relate to economic and social ties between communities, typically dominated by a central city and its associated suburban areas.

**Dependency** may be determined at the county level using information from the U.S. Census Bureau.³ The first level of dependency is the ratio of fishing-related employment to total employment. The second measure of dependency is based on an entropy index calculated using employment. In addition, location quotients are also calculated; a location quotient provides a measure of whether or not an industry or sector is basic or non-basic, and a measure of the relative concentration of an industry in a given geographical area. Data for these indicators were obtained from the U. S. Bureau of Census county business patterns data set. Finally, in addition to the quantitative values, a qualitative indicator of dependency is the presence of festivals and/or museum exhibits to celebrate or interpret local commercial fishing activities.

³For a comprehensive overview on measures of economic dependency and diversification, see Gollop and Monahan (1991), Gollop (1994), and Kovalyova and Johnson (2000).
Chapter IV

Description of the Fishery and the Communities

4.1 The Sea Scallop Fishery

4.1.1 Sea Scallop Distribution

Sea scallops, Placopecten magellanicus, are harvested throughout their geographical distribution in U. S. waters. Sea scallops are found on the continental shelf of the northwest Atlantic from the Gulf of Saint Lawrence in Canada to approximately Cape Hatteras; their distribution, therefore, in the United States Exclusive Economic Zone (EEZ) ranges from the Hague Line to Cape Hatteras. They are most abundant on Georges Bank and the Middle Atlantic Bight, with somewhat lesser abundance in the Gulf of Maine, the Bay of Fundy, and the Gulf of Saint Lawrence. Generally, scallops can be found at depths ranging from 18 to 110m. Sea scallops live in marine conditions where salinities are over 16 ppt, where there is water movement, and where temperatures are below 21 degrees Celsius (Packer et al. 1999).

Of particular interest to area management are the aggregations of scallops called beds. Beds may be sporadic or essentially permanent. The permanent beds are found to correspond to areas where temperature, food availability, substrate are suitable and where physical processes may serve to keep larvae in vicinity of spawning populations (Packer et al 1999). The beds make up major resource areas, and are more commonly occurring in the areas of Georges Bank, the Hudson Canyon, and along the Virginia-North Carolina border. These areas are presently under ad hoc area management under the current Sea Scallop Fishery Management Plan (FMP). With the development of Amendment 10 that is currently in process, area management will be further defined and additional areas are likely to be proposed for closure and reopening, as well as the consideration of developing some form of “rotation” or other opening for areas already set aside under area management for groundfish and for scallops.

4.1.2 Biological Factors Affecting the Fishery

In addition to consideration of locations of high densities of scallops, spawning also affects the timing of areas selected for exploitation because recently spawned scallops tend to have smaller meats. Scallops spawn at varying times across their range, with a single spawn in the spring typical for the northern areas and two spawning periods more common for the southern areas. Of the two spawning periods, the spring spawn is the more reliable (DuPaul et al 1989). This is important because the scallops meats weigh less after spawning, and price is determined, at least partially, by the number of meats per pound.

An additional biological factor affecting preference for fishermen for various areas
has to do with the growth of scallops and their likelihood of availability. Recruitment, growth of the sea scallop to harvestable size, varies due to the conditions of the various areas. In general, it is thought that the Georges Bank region is self-sustaining with larvae retained in the Georges Bank Gyre, while the Mid-Atlantic region has recruitment due to larvae from other source areas (Packer et al. 1999). The source areas for the Mid-Atlantic may be New York Bight, with possible augmentation from the Georges Bank area. At the time of the writing of the Essential Fish Habitat (EFH) Source document, it was thought, but not proven, that locally produced larvae are swept away from the Mid-Atlantic area and so this area is not self-sustaining. For the Gulf of Maine, and the beds of the Maine coast, it is not known if the beds are self-sustaining. In addition to larval sources, recruitment also depends on the larvae finding suitable settlement substrate. Spat, the small scallops which settle out of the water column, have better survival rates if settlement occurs on hard surfaces or sedentary branching plants and animals as opposed to shifting sands.

Although a limited number of stakeholders have discussed prey management to aid in gaining an increase of scallop yield, there is only minimal interest in controlling predation. Predation on scallops depends upon the stage of scallop development. Larval scallops are planktonic, and are, thus, expected to be preyed upon by planktonic carnivores and filter feeders. Juvenile scallops are preyed upon by several species of fish, including cod, wolffish, ocean pout, eel pout, American plaice, yellowtail flounder, winter flounder and sculpins, as well as shellfish such as crabs and lobsters. Other species also consume juvenile scallops and spat, most especially starfish.

4.1.3 An Overview of the History of Scallop Stock

Sea scallop stocks have varied over the years. Landings peaked in 1978 at slightly more than 26.5 thousand metric tons of meats, but then declined to approximately 10 thousand metric tons in 1984. In 1993, landings increased to nearly 23.0 thousand metric tons, but then declined to approximately 7.0 thousand metric tons in 1993. Between 1993 and 1995, landings remained relatively stable. For the Georges Bank area, there was a large decline in catch of almost 90% between 1990 and 1994. Both stock availability and larger stocks to the south, which drew off effort from Georges Bank, were seen as reasons for the decline in landings from Georges Bank during that time period. In the Gulf of Maine, variable landings were reported, but all seemed to be in the 500-800 metric ton range between 1991 and 1996. Average annual landings for the Mid-Atlantic Bight equaled 6.0 thousand metric tons between 1994 and 1995, which was about twice the level of landings in 1993. This was thought to be due to the strength of the 1990 and 1991 year classes. In 1996, a 23% decline in catch was noted as well as a decline in the relative abundance indices. In 1997, however, the Atlantic sea scallop was determined to be overfished. In 2000, landings exceeded 32.5 million pounds (14,816.8 metric tons), which was more than double the 1997 level of landings (NMFS 2002b). More recent data available from NMFS (2002a) suggests strong increases in the northern stocks and lesser increases in the Mid-Atlantic stocks; the fishery was listed as recovered in 2001.
4.1.4 The Current Status of the Fishery

The fishery is currently managed using a combination of limited access, effort controls, and area management. Area management is becoming more defined, and the expectation is that both the limited access nature of the fishery and effort controls will be maintained. In particular, effort controls relate to the type of gear that may be used, the number of days at sea allocated by permit type, the number of fishermen allowed per vessel; there is also a cap on increases in engine horsepower that may be undertaken at one time on a permitted vessel.

Under the limited access management that is currently in place for scallops, 290 active permits are listed in the NMFS 2002 database for limited access fishing, and 2170 permits are listed as general category access fishing. The limited access permit numbers are consistent with the data in the 2000 SAFE report of 1999 data (NEFMC 2000). In the 2000 SAFE report, however, it is reported that 301 vessels landed 400 or fewer pounds of scallops (the definition for allowable landings of general category permits); the total number of general category permits was not stated in the SAFE report. For limited access permit holders, there are three classifications that determine the allocation of number of days at sea - full time, part time and occasional, as well as definitions pertaining to gear type-- dredge, small dredge, and trawl. Full time vessels are allocated 120 days per year for fishing; part time vessels are allocated 45 days per year; and occasional vessels are allocated 10 days per year. Table 1 displays the number permits by limited access category for the fishery as a whole, and Table 2 lists number of permits by limited access category for the four port communities selected for study.

In general, dredge vessels are found throughout the range of sea scallops, while the scallop trawl vessels are more frequent in the Mid-Atlantic area. There is also a tendency for vessel size to vary by port or harbor. New Bedford has a larger average size for vessels, both in terms of length and gross tonnage; Cape May has the smallest average size. New Bedford also has the largest range of size of vessels--45--10 ft (Table 3).

The price structure for the scallop fishery products is based on the location of harvest, the size class of scallop, and the abundance of the size class at any one time. Typically, scallops from Georges Bank and the Great South Channel are preferred, as they are larger and more "muscular" than the scallops from the Mid-Atlantic. Normally, the price differential for scallops is on the order of $.25 per pound for U10s from the Georges Bank area versus those of the Mid-Atlantic. A recent article in National Fisherman (Van Zile 2002) shows a table of prices from the New Bedford Seafood Auction with the price differential dropping by area of harvest with the smaller scallops for April of 2002. The U12 class of scallop from the Great South Channel was at the time averaging $6.71 per pound, and those from Georges Bank and the Mid-Atlantic were averaging $6.20 and $5.14 per pound, respectively. The 20-30 meat per pound class appears in the table to be consistent within approximately $.10 per pound at roughly $3.70 for all areas harvested. Price by area, shipping costs, and fuel usage to steam to the area, are often factored into selection of specific areas harvested.
Table 1. Limited access permits by category for the Northwest Atlantic sea scallop fishery from NMFS April 8, 2002 permit database

<table>
<thead>
<tr>
<th>Permit category</th>
<th>Number of active permits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full time dredge</td>
<td>222</td>
</tr>
<tr>
<td>Part time dredge</td>
<td>14</td>
</tr>
<tr>
<td>Occasional dredge</td>
<td>5</td>
</tr>
<tr>
<td>Full time small dredge</td>
<td>17</td>
</tr>
<tr>
<td>Part time small dredge</td>
<td>6</td>
</tr>
<tr>
<td>Full time net</td>
<td>16</td>
</tr>
<tr>
<td>Part time net</td>
<td>13</td>
</tr>
<tr>
<td>Occasional net</td>
<td>15</td>
</tr>
</tbody>
</table>


While scallops may be landed anywhere that there is a harbor with dealer holding the appropriate permit, only a limited number of ports have substantial landings of scallops. These ports are dominated by landings in New Bedford, MA; Cape May, NJ; and in the Hampton Roads area of Virginia in two adjacent cities, Hampton and Newport News, and in Seaford, VA, which is an unincorporated village within York County, VA. These ports of landing are also the most frequently listed primary ports and home ports according to the NMFS permit data (see Tables 1 and 2).

4.2 Community Descriptions

As discussed in Chapter III, three levels of community--the county, the city/town, and the fishing community--are described in the following text. The counties are discussed because much of the first level economic interactions with the fishery are captured within the county. The cities and towns as described as they form both social and legal/political entities in which the port is located, particularly with regard to land use and economic development funding. Finally, the fishing community is the community of interest because it focuses on the fishery for employment and income.
Table 2. Sea scallop permits by category for the study communities from the NMFS April 8, 2002 permit database.

<table>
<thead>
<tr>
<th>Permit Category</th>
<th>New Bedford</th>
<th>Cape May</th>
<th>Seaford</th>
<th>Hampton Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full time dredge</td>
<td>101</td>
<td>21</td>
<td>19</td>
<td>36</td>
</tr>
<tr>
<td>Part time dredge</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Occasional dredge</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Full time small dredge</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Part time small dredge</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Full time net</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Part time net</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Occasional net</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>107</td>
<td>38</td>
<td>19</td>
<td>47</td>
</tr>
</tbody>
</table>

Source: http://www.nefsc.noaa.gov/ro/doc/vesdatal.htm

Table 3. Vessel size by port from the NMFS April 8, 2002 permit database

<table>
<thead>
<tr>
<th></th>
<th>New Bedford</th>
<th>Cape May</th>
<th>Seaford</th>
<th>Hampton Roads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ave. length (ft)</td>
<td>85.5</td>
<td>78.5</td>
<td>83.2</td>
<td>78.7</td>
</tr>
<tr>
<td>Ave. gross tonnage (mt)</td>
<td>168.4</td>
<td>142.9</td>
<td>143.7</td>
<td>146.2</td>
</tr>
<tr>
<td>range of length (ft)</td>
<td>45 to 110</td>
<td>60 to 92</td>
<td>75 to 94</td>
<td>63 to 118</td>
</tr>
<tr>
<td>range of gross tonnage (mt)</td>
<td>33 to 295</td>
<td>76 to 195</td>
<td>125 to 195</td>
<td>74 to 244</td>
</tr>
</tbody>
</table>

Source: http://www.nefsc.noaa.gov/ro/doc/vesdatal.htm

4.2.1 Bristol County, Massachusetts

4.2.1.1 Overview

Bristol County is located on the south shore of the state. It is bounded on the west by the Massachusetts-Rhode Island border, on the north by Norfolk County, on the east by Plymouth County, and on the south by Buzzard’s Bay. Bristol County has economic and social influences from the two major cities in the region. The northern part of the county
has a stronger influence from Boston, and the southern and western portions of the county have more interactions with and influence from Providence, RI. Twenty cities and towns are found within Bristol County. The largest population centers are the cities of Attleboro, Fall River, New Bedford, and Taunton. While Taunton is the county seat, New Bedford is the major city within the county.

Bristol County began as part of Plymouth Colony. The County was incorporated in 1685. The economic base of the county has considerably changed over time. During the Colonial era, the major industries included shipbuilding, metal smithing, pottery making, and early textile manufacturing. During the 1800s, increased manufacturing occurred, with Fall River becoming a global center for cotton textiles; Attleboro and Taunton became nationally known for working in precious metals and jewelry manufacturing (http://www.bristol-county.org/about/history.shtml). During this period, New Bedford also became a global center, but in this instance for whaling and for provision of whale oil and other products from whales. While these industries were strong in the 19th and early 20th Centuries, more recently the area has shifted its focus to tourism and retail, while retaining some manufacturing. In addition to manufacturing, fishing is also locally important, but is primarily based in the New Bedford harbor area.

4.2.1.2 Geography

Location map

A map of Bristol County and its surroundings is shown in Figure 5.

Metropolitan Statistical Area(s)

Bristol County is part of several Metropolitan Areas as determined by the U. S. Bureau of Census. Western Bristol County is shown in Figure 6 as part of the Providence-Fall River-Warwick MSA, New Bedford is the center of a Primary MSA, and the northern and eastern portion of the county are shown to be part of the Boston-Worcester-Lawrence Consolidated MSA (Figure 6).

Localities within the County

As noted above, twenty cities and towns are located within the borders of Bristol County.

Distance to major cities

Bristol County’s western boundary abuts the eastern boundary of Providence, RI. From the northern border of Bristol County, it is approximately 30 miles to Boston.
Figure 5. Map of Bristol and surrounding counties in Massachusetts and Rhode Island
Figure 6. Map of Massachusetts MSAs. From U. S. Bureau of Census

4.2.1.3 Governance

Bristol County has an elected County Chair(wo)man and two elected County Commissioners. Other elected officials include the sheriff, two Registers of Deeds, and a Clerk of Courts (http://www.naco.org/counties/counties/county.cfm?id25005).

4.2.1.4 Services

As is typical of many New England counties, the main services provided by the county include elections, law enforcement, and legal services. The county provides law enforcement through the sheriff's office. Legal services are provided via the county courts, the registry of deeds, probate office, and vital records. Bristol County also has a Convention and Visitor's Bureau. The communities of both Bristol and Plymouth Counties coordinate in the Southeastern Regional Planning & Economic Development District, which handles planning and economic development issues including transportation, environmental concerns, and planning and zoning at a regional level.

4.2.1.5 Transportation

Highways

The major highways that are found in Bristol County include Interstate 195, Interstate 95, State Route 140, and U. S. Route 6.

Air and Rail

There is air service provided directly to Bristol County at the New Bedford Airport. Major airlines serve T.F. Green Airport in the Providence, RI area and Logan Airport in Boston.

The nearest major rail station for passenger rail is the Amtrak station in Providence, RI for Bristol County. Currently, passenger rail lines are being developed for New Bedford and Fall River to connect into Boston’s MTA. Conrail provides services for freight to communities within the county.

Maritime

Ferries are available in New Bedford to access Martha’s Vineyard and Cuttyhunk. Both Fall River and New Bedford are stops for various cruise lines and the Southeastern Regional Planning and Economic Development District list both communities as increasing their port activities as part of intermodal transport, which will connect to other transportation systems.

4.2.1.6 Demography
Population

Bristol County had a total population of 534,678 in 2000. Females outnumbered males by 4%.

Racial and Ethnic Composition

Nearly 98% of Bristol County’s population self-identified as being members of a single racial group. For those individuals identifying themselves as being of a single race, 91% were white; 2% were black or African American; and 3.1% listed some other race. Asians, Pacific Islanders, and American Indians and Alaska Natives comprised less than 2% of the population.

Approximately 86.5% of the population are native born citizens of the United States, with 70% born in the state of Massachusetts. Of the foreign born, roughly 15% entered between 1990 and 2000. Europe is the major area from which the foreign born originated (73.4%), Asia is next (9.9%), and Latin America is third (8.9%). The largest declared ancestries are Portuguese (32.2%), Irish (18.4%), English (15.0%) and French (14.7%).

Age Structure

The median age for the population of the county is 36.7 years. People under the age of 18 make up 24.6% of the population, and those over 65 make up 14.2% of the population.

Household Composition

In 2000, there were 205.4 thousand households in Bristol County. Family households comprised 68.5% of the total number of households, and female head of household accounted for 13.0% of all households. Of the total households, 26.5% consisted of the householder living alone, and 11% were characterized by a householder over 65 years old. Households with children under 18 years of age comprised 35.6% of the total households, and households with persons over 65 years of age comprised 25.8% of the total households. The average household size was 2.54 persons.

Bristol County had 216.9 thousand housing units. Of these units, 94.7% were occupied; 5.3% were vacant; and 0.9% were used for seasonal, recreation or occasional use. The homeowner vacancy rate was 0.8%, and the rental vacancy rate was 5.5%. Owner occupied housing units were 61.6% of the total, and renter occupied housing units made up the remaining 38.4% of housing units.

The median value for owner occupied units in Bristol County was $151.5 thousand, and the median monthly mortgage payment for those individuals with a mortgage was $1,212. For renter occupied units, the median rent was $499 per month.
Educational Trends

Of the 348.8 thousand people aged 25 years and older, 13.1% had an educational attainment of less than ninth grade; 13.7% had 9th to 12th grade education, but no diploma; 74.7% had a high school diploma or higher; and 20.6% had a bachelor's degree or higher.

Income

Per capita income in 1999 was $20,978; the median household income was $43,496, and median family income was $53,733. Approximately 52,236 individuals or 10% of the population was found to be below the poverty level with 8.9% of the individuals having income less than the poverty level being 18 years of age or over.

Employment

Bristol County had 417.9 thousand people over the age of 16 in 2000. Of those people, 275.1 thousand or 65.8% were in the labor force. For the labor force participants, 5.8% were unemployed, and 94.2% were employed in the civilian labor force.

Employment Industries

For people residing in Bristol county, the strongest occupational sector is that of management, professional and related occupations in which 30.7% of the workforce participates. The next largest sector were sales and office occupations, which employed 26.3% of the workforce. Farming, fishing and forestry occupations make up the smallest sector of the workforce with 920 persons participating or 0.4% of the total labor force.

4.2.2 New Bedford

4.2.2.1 Overview

In terms of landed value, New Bedford has consistently been among the top fishing communities in the nation. In 2001, it became number one in the nation. Approximately 89.0 million pounds of seafood, with an ex-vessel value of $143.6 million, was landed in New Bedford in 2000 (NMFS 2001). Scallops accounted for a large portion of these landings at approximately 15.8 million lbs. and $83.0 million dollars. Other fish landed in the port include groundfish, monkfish, and lobster. Very recently, an article in the local paper stated that one of the cold storage facilities would begin handling herring as well as the other species (Standard-Times 2002).

New Bedford is the largest city in Bristol County. The harbor is located near the mouth of the Acushnet River along the shore area of Buzzards Bay. Port development is largely to the north of the hurricane barrier and south of Rt. 195 in New Bedford and between the hurricane barrier and Rt. 6 in Fairhaven (Figure 7).
As a city, New Bedford has had a shifting economic base through its history. In its earliest days, fishing was quite important as New Bedford was the worldwide center for whaling. Both transportation of whale products and the manufacturing of raw whale products into oil, spermaceti candles, and whalebone persisted from the early 1700s through the early 20th Century. In addition to providing employment for New England Yankees, the whale fishery also drew participants from around the world, and New Bedford was one of the most cosmopolitan places worldwide. From approximately the time of the Civil War until roughly the 1930s, the cotton fabric manufacturing industry came to dominate New Bedford. With the mills came a population to work in the mills from rural New England and Quebec. More recently, and for approximately the last 70 years, fishing has again become a dominant industry in New Bedford. The more recent fishery is for food rather than for fuel, and includes species of the New England groundfish fishery, sea scallops, monkfish, and lobster. Of these, both groundfish and sea scallops are dominant in terms of vessels, but within the last few years, scallop landings in terms of value and pounds has dominated.

According to the Port of New Bedford Handbook (2002), the port is the largest breakbulk handler of perishable items in Massachusetts and nearby states. Fruit and fish are imported in refrigerated vessels. The port has one of the largest cold treatment centers for restricted imported fruit found on the east coast. The port also handles large volumes of imported frozen fish.

New Bedford has a diverse population with regard to ethnicity based on national origin and ancestry. New Bedford has a large population of Portuguese immigrants, some of whom have been part of the community since the days of whaling. Evidence of a Portuguese presence is seen in the Portuguese Consulate located within the city as well as the Portuguese language branch of the public library available in the southern section of the city and in the Museum of Madieran Heritage found north of the downtown area. In addition to people of Portuguese descent, there are still a number of people of French Canadian descent whose families immigrated while the textile mills were large operations. More recent immigrants are from Asia and “Mayan” areas of Central America.

4.2.2.2 Geography

General

A map of New Bedford and surrounding municipalities is provided in Figure 7.

Distance to major cities

New Bedford is approximately 33 miles from Providence, RI and roughly 55 miles from Boston.
Figure 7. Aerial photo of New Bedford Harbor (from USGS Terraserver 8 m resolution)
4.2.2.3 Governance

New Bedford has a Mayor - Council form of government.

4.2.2.4 Services

The city provides numerous services to its population. There is city water and sewer, as well as public housing, policing, parks and recreational activities, and educational/employment services. The city controls the uses of property on the New Bedford side of the harbor through the Harbor Development Commission via the public planning process. Other facets of the Harbor Development Commission is that it puts forth the rules for the use of the publicly held property in the harbor, and also serves as the quasi-judicial appeal organization for the Display Auction. Recently, the South Terminal Extension was converted from unused former industrial property to usable land for fish processing and other water dependent uses, and the Economic Development department is currently providing information and aiding in finding appropriate purchasers for the properties.

4.2.2.5 Transportation

Air and rail

Air and rail transportation are described in the Bristol County description in general. There is an airport, but the New Bedford Airport has limited service. In terms of rail access, local service is in the planning and permitting stages for a new connection via the MTBA to Boston.

Highways

Major highways in New Bedford are Interstate 195, State Route 140, and U. S. Route 6. Route 140 provides north-south connections to Taunton and toward Boston. Interstate 195 and U. S. Route 6 trend east-west and offer connections to Providence, RI and Cape Cod.

Maritime

New Bedford and Fall River both provide docks for tour vessels that make stops in the harbors. New Bedford also has two passenger ferries; one ferry runs from a point outside the hurricane barrier to Marthas Vineyard, and the other runs from the commercial dock to Cuttyhunk.

4.2.3 Port - New Bedford Harbor

4.2.3.1 Description and Activities
New Bedford Harbor has a strong presence of maritime activities. In addition to the commercial fishing vessels, which utilize the harbor, passenger travel and cargo service also is found within the harbor. Passenger service consists of both cruise ship dockings and ferry services. New Bedford has two ferry services; one service to the island of Cuttyhunk, and the other service to Martha’s Vineyard. The ferry vessels have been observed carrying limited amounts of cargo as well as passengers. Cargo service has a specialized component of importers of products from Cape Verde and Portugal, and the city is attempting to convince the local ferry authority that cargo service to Nantucket and Martha’s Vineyard would be beneficial to both New Bedford and the islands.

New Bedford harbor serves two local geo-political entities, the City of New Bedford on the west side and the Town of Fairhaven on the east side. Fishing related activities occur on both sides of the harbor, with offloading and processing dominantly occurring on the New Bedford side, and large scale ship repair on the Fairhaven side. Both localities provide docks for tying up vessels and wharves for ancillary activity. On both sides of the harbor, the vessels raft together at the docks, and repairs that do not require hauling the vessel also occur at these locations, often with small scale metal fabrications done directly at the wharves.

New Bedford has an industrial waterfront, partially due to historic uses from whaling and textile manufacturing, and partially due to requirements of modern fisheries’ activities. The waterfront is separated from downtown by Route 18, also known as the J. F. Kennedy Highway. To the southernmost end of the city, residential uses predominate outside of the hurricane barrier. Along the harbor nearing the center of the New Bedford side, former textile mills, which have been converted to other uses or are abandoned, buffer the active working waterfront. New Bedford’s harbor area is a designated port area, as defined by the Massachusetts Office of Coastal Zone Management under Chapter 91 of the General Rules of the Commonwealth of Massachusetts. The uses in the harbor area are generally restricted to those that benefit water dependent activities. The harbor is under use restrictions delineated by the Harbor Development Commission, with substantial public input from citizens of both New Bedford and Fairhaven. The planning document for further development of the harbor is also under the aegis of the Harbor Development Commission, and a new Harbor Development Plan was issued in 2002.

New Bedford’s harbor area is recognized to have three basic areas – the South Terminal, the central wharf area, and the North Terminal. The newest extension of the South Terminal, locally known as the Standard-Times Field, is a reclaimed brownfield, or area of prior industrial activity that was part of an EPA sponsored clean-up project undertaken in conjunction with the city. The property in the South Terminal Extension is offered for sale for fishing industry uses, while other property in the South Terminal and central wharf area is owned by the city and made available on a long-term lease. At least some of the property in the North Terminal area is under private ownership.

The South Terminal area is the main area where fish are offloaded. In addition, several processors, wholesalers, and retailers of fish, as well as a foul weather clothing
manufacturer, a settlement house, box manufacturers for packing fish, a restaurant which serves as the south end fisherman’s hangout, fuel and gear suppliers, and a diesel repair area are situated at the South Terminal.

In addition to the docks, wharves, a major ice house and a major fueling location the central waterfront area has fish houses for offloading fish and for packing and shipping. The wharves are a center for small scale vessel and gear repair, and the location where independent suppliers cater to vessels by providing grub and water and cleaning services. Also in the central wharf area is the State Pier, which is the location where cargo is offloaded, which includes cargo from Cape Verde and Portugal (Hall-Arber, 2001). Other activities in the central wharf area are tourist activities with two published and some guided dock walks, a visitor center, a ferry service to Cuttyhunk, a harbor tour vessel, the schooner Ernestina (a vessel for educational services), and within the last year, the State Pier area, which has become the center for cruise ships landings. Inland of the wharf area, between Route 18 and the downtown, are a number of fishery related businesses including marine lawyers, a settlement house, gear providers, and ship supply businesses.

The North Terminal area, which is located north of Route 6, has processors with bulkheads for offloading vessels. Also in the area are gear providers on Fisherman’s and Pope’s Islands, while on the mainland there is also a location for washing out trucks, which haul fish, a diesel repair, a well-recognized fisherman’s hangout, and cold storage facilities.

On the Fairhaven side of the harbor, fishing related businesses include two shipyards with the capacity to haul large vessels for hull repair, a ship supply store, a marine lawyer, a settlement house, a scalloper’s bar that is the fisherman’s hangout, a propellor shop, and two gear suppliers. Vessel activity takes place mainly now at the Union Wharf area and somewhat north. The area south of Union Wharf, which had dock space, an ice house and a winch manufacturer, has been purchased by a local ferry operator for maintenance of ferry vessels. The conversion of this property is not yet complete. Union Wharf is owned and maintained by the town. At Union Wharf, both large scallop vessels and small lobster vessels routinely tie up at the dock.

Infrastructure

The New Bedford waterfront area provides substantial services for the fishing industry. There are several ship suppliers, with the major gear supplier for the scallop fishery for this region, fuel providers, a large ice house, docks, processors, settlement houses, insurance and legal services, divers, a water provisioner, lumpers, and individuals who clean and grub the vessels.

The fuel providers, gear and ship suppliers, processors, ice house, legal and insurance services, divers, water provisioner, and people who clean and grub the vessels are all private companies for which services are paid dependent upon arrangements between the business and usually the boat owner. Lumpers are paid by the captain and
crew, and while the boat owner may use the grubbers, payment for grub is taken out before the crew share is paid.

In addition to business infrastructure provided by private industry, the City of New Bedford provides some elements of physical, economic and social infrastructure. First and foremost, the city provides the wharf and dock facilities for docking. The fees are kept low, at $350 per year. In addition, the city manages the dredging needed for vessels to use the harbor. In addition to the docks and bridges, which need to be maintained, the city also has coordinated and provided the needed matching funding for the Hurricane Barrier and Rt. 18 (JFK Highway). The Hurricane Barrier separates the harbor area from Buzzards Bay for the purpose of maintaining a safe harbor area. Route 18 connects the waterfront seafood industrial area to Interstate 195. Social infrastructure is provided by the city by the Fishing Families Assistance Center, which provides access for fishermen and their families to educational opportunities, computer access, a repository for regulations, and also serves as a location for meetings. Economic infrastructure provided by the city includes specific loans through the New Bedford Economic Development Council, which provides gap funding of $5,000 to $50,000.

Port concerns

Interviews with people in New Bedford revealed some concerns with regard to the harbor. These concerns relate to services, gentrification, and equity of enforcement.

Services particularly of concern for the fishermen and those who perform vessel repairs related to the need for extra dock space and areas for working on gear. In particular, there have been vessels rafted seven deep of late, and more vessels would be detrimental to accomplishing required tasks. One welder stated “(I)t's hard to do your job when you get there tired from hopping from boat to boat with your equipment.” Further, some vessels are tying up perpendicular as opposed to parallel to the wharf, which means that the vessel is subject to more movement and higher potential for damage. Other services that would be seen as beneficial would be the provision of space to work on nets and dredges and increased security at night. One informant suggested using part of the area of the power station that is slated to become the Oceanarium’s parking lot as a space for working on gear. Increased participation on an intermittent basis that could occur due to area management may exacerbate these space problems, by enhancing the need for more dock space for transient vessels. In addition, those transient vessels may also require space for working on gear.

Gentrification has been interpreted by some of the fishery participants in New Bedford Harbor as the addition of cruise vessels and tourist activities. Although the concerns were expressed, there is a recognition that New Bedford needs to diversify its economic base, and hopes were articulated that careful design, planning, and implementation of tourism focused on the fishing industry would alleviate potential conflicts. Again, this space issue may be exacerbated by having larger numbers of transient vessels in the harbor placing a “squeeze” on available space for dockage.
Finally, equity of enforcement has become an issue with regard to determination of "water dependent" uses for the Harbor Development Plan. In particular, the fishery participants expressed concerns that a hardware store located on Pope’s Island is not designated “water dependent,” so it pays a usage fee; yet, it provides materials that they use. While management of the scallop fishery has nothing to do with the determination of water dependent uses, the concerns that this hardware store may leave the area due to increased fees may mean that a source of supplies for transient vessels could become more limited.

4.2.3.2 New Bedford Demographics

New Bedford, Fairhaven, and Bristol County demographic information is provided in Table 4.

Racial and ethnic characteristics

Like Bristol County, New Bedford is dominantly white. However, those who list "some other race" occur at nearly three times the county rate, and both blacks and Hispanic or Latino groups are a larger percentage than those of the two racial groups for the county. Ethnicity based on national origin show somewhat greater diversity. Thirty eight and six tenths percent of the total population of New Bedford is of Portuguese ancestry, 14 % are "other ancestries," and 9.1 % are French.

Age Structure

Residents of New Bedford are, in general, younger than the residents of Bristol County, as a whole. The median age of citizens of New Bedford is 35.9 years. People under the age of 18 make up 24.9 % of the population, and those over 65 make up 16.7 % of the population. The total of those normally considered out of the job market due to age considerations (those too young and those retired) make up 41.6 % of the New Bedford population.
Table 4. Demographic and labor information for Bristol County, New Bedford, and Fairhaven, MA

<table>
<thead>
<tr>
<th></th>
<th>Bristol County</th>
<th>New Bedford ¹</th>
<th>Fairhaven ²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>534,678.00</td>
<td>93,768.00</td>
<td>16,159.00</td>
</tr>
<tr>
<td>% male</td>
<td>48.00</td>
<td>47.10</td>
<td>47.20</td>
</tr>
<tr>
<td>% female</td>
<td>52.00</td>
<td>52.90</td>
<td>52.80</td>
</tr>
<tr>
<td><strong>Racial and Ethnic Composition (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>one race</td>
<td>97.70</td>
<td>94.10</td>
<td>98.80</td>
</tr>
<tr>
<td>white</td>
<td>91.00</td>
<td>78.90</td>
<td>96.30</td>
</tr>
<tr>
<td>black/African American</td>
<td>2.00</td>
<td>4.40</td>
<td>0.60</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
<td>0.20</td>
<td>0.60</td>
<td>0.60</td>
</tr>
<tr>
<td>Asian</td>
<td>1.30</td>
<td>0.70</td>
<td>0.40</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>some other race</td>
<td>3.10</td>
<td>9.50</td>
<td>1.20</td>
</tr>
<tr>
<td>Hispanic or Latino</td>
<td>3.60</td>
<td>10.20</td>
<td>0.80</td>
</tr>
<tr>
<td><strong>Ancestry</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portuguese</td>
<td>Portuguese 29 %</td>
<td>Portuguese 38.6 %</td>
<td>Portuguese 33.3 %</td>
</tr>
<tr>
<td>French</td>
<td>11.9 %</td>
<td>Other 14%</td>
<td>English 17.1 %</td>
</tr>
<tr>
<td>English</td>
<td>11.7%</td>
<td>France 9.1%</td>
<td>French 15.6 %</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>median age (years)</td>
<td>36.70</td>
<td>35.90</td>
<td>41.20</td>
</tr>
<tr>
<td>% under 18 years</td>
<td>24.60</td>
<td>24.90</td>
<td>21.70</td>
</tr>
<tr>
<td>% 65 year or over</td>
<td>14.10</td>
<td>16.70</td>
<td>19.50</td>
</tr>
<tr>
<td><strong>Household Composition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total households</td>
<td>205,411.00</td>
<td>38,178.00</td>
<td>6,622.00</td>
</tr>
<tr>
<td>% family household</td>
<td>68.50</td>
<td>63.10</td>
<td>64.20</td>
</tr>
<tr>
<td>% female headed households</td>
<td>13.00</td>
<td>18.90</td>
<td>11.00</td>
</tr>
<tr>
<td>% households with children under 18</td>
<td>35.60</td>
<td>34.10</td>
<td>30.30</td>
</tr>
<tr>
<td></td>
<td>2014</td>
<td>2015</td>
<td>2016</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>% households with individuals over 65</td>
<td>25.80</td>
<td>29.00</td>
<td>32.00</td>
</tr>
<tr>
<td>average household size</td>
<td>2.54</td>
<td>2.40</td>
<td>2.38</td>
</tr>
<tr>
<td><strong>Education (% of population over 25 year of age)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>less than 9th grade</td>
<td>13.10</td>
<td>24.30</td>
<td>9.40</td>
</tr>
<tr>
<td>9th to 12th grade, no diploma</td>
<td>13.70</td>
<td>18.10</td>
<td>13.80</td>
</tr>
<tr>
<td>high school graduate or above</td>
<td>73.20</td>
<td>57.60</td>
<td>76.80</td>
</tr>
<tr>
<td>bachelors degree or above</td>
<td>19.90</td>
<td>10.70</td>
<td>16.90</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>median household income</td>
<td>43,496.00</td>
<td>27,569.00</td>
<td>41,696.00</td>
</tr>
<tr>
<td>median family income</td>
<td>53,733.00</td>
<td>35,708.00</td>
<td>52,298.00</td>
</tr>
<tr>
<td>% below poverty level</td>
<td>10.00</td>
<td>20.20</td>
<td>9.00</td>
</tr>
<tr>
<td>% 18 years and over below poverty level</td>
<td>8.90</td>
<td>17.20</td>
<td>8.30</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>population over 16</td>
<td>417,857.00</td>
<td>73,287.00</td>
<td>13,085.00</td>
</tr>
<tr>
<td>labor force (#/%)</td>
<td>275,122 / 65.8</td>
<td>42,308 / 57.7</td>
<td>8278 /3.3</td>
</tr>
<tr>
<td>unemployed civilian (% labor force)</td>
<td>5.80</td>
<td>8.70</td>
<td>3.90</td>
</tr>
<tr>
<td>Armed Forces (% population &gt;16)</td>
<td>0.10</td>
<td>0.20</td>
<td>0.40</td>
</tr>
<tr>
<td><strong>Employment Industries</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>occupational sector (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>management, professional and related</td>
<td>30.70</td>
<td>20.80</td>
<td>29.80</td>
</tr>
<tr>
<td>service occupations</td>
<td>15.40</td>
<td>19.80</td>
<td>14.00</td>
</tr>
<tr>
<td>sales and office occupations</td>
<td>26.30</td>
<td>23.60</td>
<td>27.50</td>
</tr>
<tr>
<td>farming, fishing and forestry</td>
<td>0.40</td>
<td>1.00</td>
<td>1.50</td>
</tr>
<tr>
<td>construction, extraction and maintenance occupations</td>
<td>9.50</td>
<td>9.80</td>
<td>9.50</td>
</tr>
<tr>
<td>production, transportation, and material moving occupations</td>
<td>17.80</td>
<td>25.10</td>
<td>17.80</td>
</tr>
<tr>
<td><strong>NAICS 1999 (employment by establishment location)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>farming, fishing, hunting, and agriculture</td>
<td>347.00</td>
<td>347.00</td>
<td>347.00</td>
</tr>
<tr>
<td>Industry</td>
<td>Employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mining</td>
<td>59.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>utilities</td>
<td>969.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>construction</td>
<td>8,090.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>manufacturing</td>
<td>47,389.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>services (all other employment categories)</td>
<td>141,426.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Detailed data for New Bedford and Fairhaven are not readily available. Source: U.S. Census Bureau, Year 2000 Census*

Household Composition

The 2000 census shows New Bedford to have 38,178 households. Of these households, 63.1% were family households, and 18.9% were female headed households. To compare, New Bedford has fewer family households compared to Bristol County, but has more female headed households than the county as a whole. Households with children under 18 years of age comprised 34.1% of the total households, and households with persons over 65 years of age comprised 29% of the total households. The average household size was 2.4 persons. To compare to the county as a whole, New Bedford has slightly fewer households with children, but more households with people over 65. The number of individuals per household in New Bedford is slightly less than it is at the county level.

Employment Industries

To determine the number of establishments in New Bedford, it was necessary to obtain information from the U.S. Gazetteer for zip codes in New Bedford. The Gazetteer lists zip codes 02719, 02740, 02743, 02744, 02745, 02746, and 02748 as being associated with New Bedford. The zip code 02719, however, is for Fairhaven, which is reported separately. The remaining seven were used to determine the number of establishments through the county business patterns data by zip code.

Employment from the NAICS database of the U.S. Bureau of Census shows that in March of 1999, 99 of a total of 3,067 establishments in New Bedford were in the forestry, fishing, hunting, and agriculture category. The largest number of establishments were retail trade and other services with 526 establishments and 330 establishments, respectively. The next most common employment establishments were health care and social assistance with 306 and accommodation and food services with 289.

By number of employees, there were two very large employers—a general and surgical hospital and a manufacturer of sporting goods, which fall into the category of large employer with in excess of 1000 employees. Five other manufacturing establishments are not quite as large; they hired between 500 and 999 employees. For
forestry, fishing, and agriculture 99 establishments are recorded; one establishment employs between 20 and 49 employees, with the largest number of establishments (82) hiring between 1 and 4 employees.

To determine employment in fishing affiliated industries, fishing, ice manufacture, boat repair, fish processing, wholesale fish, and retail fish markets categories were examined. For the seven zip code areas, there were 155 establishments. Fish processing establishments consisted of 12, of which two employed 1-4, five employed 5-9, two employed 10 to 19, one employed 20-49, one employed 50-99, and one employed 100-249 employees. The ice manufacturer employed between 20 and 49 employees. Wholesale and retail fish trade has 42 establishments that mainly employed 1-9 people, but seven wholesalers employed between 20 and 49 people, and one wholesaler employed 50-99 people. Boat repair in this area entails one establishment that employed between 1 and 4 people.

4.2.4 The New Bedford Fishing Community

The fishing community of New Bedford is locally recognized to be made up of fishermen, their families, boat owners, processors, gear suppliers, and other support services, which are located in New Bedford and Fairhaven. Among the additional support services are the two ship yards, three settlement houses, one independent ice house, welders and boat repair people who work on the wharves, boat cleaners, and suppliers of water, fuel and grub. For the scallop fishery, other fisheries are also considered by some to be important to the fishing community, including the groundfish participants as they share harbor space and areas fished, and to some extent the local lobstermen who make up a small segment of the community, but also share the harbor and some overlap of fishing area. All the fishery participants are seen as necessary due to the fact that their presence helps keep the congregation of services conveniently located in New Bedford and Fairhaven. Furthermore, participants who may dock on either side of the water consider themselves, in essence, one fishing community.

Distinctive in the fishing community of New Bedford Harbor is the position of women with regard to the fishery. Actual participation of women on the vessels at sea is virtually non-existent. There is one woman who reportedly fishes with her husband, but she is unique. Much more common for women is the employment in on-shore services. Women have important positions in the New Bedford fishing economy as owners and employees of ship supply stores and settlement houses. One woman owns a fleet of five vessels in addition to having other business interests. Another woman owns a vessel with her husband. Despite women boat owners, women usually self identify as something else, for example a fisherman’s wife, at the public meetings. Women also hold less prestigious work as grubbers and cleaners of the boats. A final group of women associated with the scallop fishery—spouses of fishermen—have retained a more traditional role of homemaker.

New Bedford is a large fishing community when compared to the remaining three in this study. New Bedford is listed as the principal port for 234 vessels according to the
data available from NMFS, and approximately half of these (95) have limited access scallop permits. All the permits for New Bedford are for scallop dredge vessels. Despite the apparently large size of the community, it is still sufficiently small for many of the fishermen to recognize one another. One way that scallopers distinguish themselves from other fishermen is through the wearing of a shackle earring. This local accessory has fairly recently begun to be worn. The original design was created by a captain and his wife in conjunction with a local jeweler.

The New Bedford fishing community, although consisting of fishers who typically tie up and have interactions in New Bedford harbor, the service and gear providers, boat owners, processors, processing employees and their families, is not strictly composed of people who reside in New Bedford and Fairhaven. According to a settlement house owner, who prepares approximately 500 to 600 settlements, nearly everyone resides in an area "shown on the back of the (New Bedford) phone book. The guys mainly live in New Bedford, Dartmouth, Fairhaven, Westport and Mattapoisett... Oh, yeah, and some come out of Rockland, Maine." A boat owner and fisheries consultant in Rockland suggested that 50 men fish from Rockland out of New Bedford. Other people suggested that more of the New Bedford fishermen for the scallop fishery reside at greater distance from the harbor. One fisherman's wife indicated that two of the men on her husband's boat "live in Rhode Island to avoid some of the taxes." She also knew of a captain who "comes in to port here, gets a rental car and heads home to North Carolina." In addition, one fleet owner stated that he has fishermen who came from as far Seattle and Florida. This suggest that while New Bedford has a core of fishermen who reside in an area near to New Bedford, and that there is also a small core of New Bedford fishers who reside in Rockland, Maine, there is a very dispersed population of people with employment ties to New Bedford throughout the country.

New Bedford has active fisheries organizations. They include the Fisheries Survival Fund, Trawlers Survival Fund, Shore Support, and the Scallop Group. The city and state cooperate in funding parts of the Fishing Families Assistance center, which provides a location for communication, education, and meetings. Along with these active groups, there are others that are not quite as active. For the scallop fishery, Fisheries Survival Fund (FSF) is perhaps the most active. FSF has undertaken to gain re-openings on Georges Bank and in the Nantucket Lightship closed area, as well as employing three consultants with strengths in politics, law and science. This organization has undertaken to create a "strawman" for Amendment 10, or as their director suggests "our scientist wrote Amendment 10." FSF is funded by donations taken from the catch value. FSF has a core group who reviews regulations and directs the consultants. Shore Support has a focus that is more on the family and assisting in keeping family together through good times economically (when Dad’s at sea) and through tougher times (when the family gains less income). The Scallop Group meets periodically and is made up mainly of boat owners.

The New Bedford fishing community banded together recently to have a Fisherman’s Rally in June of 2002 in response to the groundfish case determination to further restrict days at sea. Despite this cooperative effort, there are distinct factions
recognized by community members. Some of the differentiation is based on fishery-groundfish vs. scallop vs. lobster vs. gillnet. Despite these groupings, there is generally acceptance that the fisheries are interconnected, sometimes more directly and some more indirectly. More direct connections include gillnet vessels to lobster vessels. One of the local lobstermen stated “the gillnet restrictions have affected us, now it's much harder to get bait.” Perhaps more indirectly, the presence of all the fishery participants comprises a critical mass of clients for the various services.

A more contentious grouping is between people who advocate ITQs, fleet consolidation, and efficiency, and those who prefer to maximize the number of boats and jobs. Typically those who advocate ITQ as a method of management are scallop fleet owners who presumably were those individuals identified in Doering, Moss and Terkla, (1986) as those with a business view. The group that prefers more boats and more jobs tends to be characterized by owner-operators, crews, women, and strong participants of FSF and Trawler Survival Fund.

The New Bedford fishing community is ethnically diverse, as is the city of New Bedford. A high proportion of the groundfish fleet is owned and crewed by people of Portuguese ancestry, while the scallop vessels have a somewhat different ethnic representation. Scallop vessels tend to be owned by Norwegians and Yankees, and crews may include these two groups plus eastern Europeans (Poles), Filipinos, and Cambodians. Processors hire workers who have green cards, mainly of the group locally considered “Mayans” on a week-by-week or day-by-day basis. Other processing employees observed from people going to work in the south terminal area included Asian and Mexican people who reside nearby--several of whom bicycled or walked to work, in addition to Yankees.

4.2.4.1 Fairhaven

4.2.4.1.1 Overview

Fairhaven is the town on the east side of New Bedford harbor. Historically, Fairhaven has benefitted from the generosity of Henry Huddleston Rogers, a native son who made his fortune in oil, who provided funding for development of the library and for improving the town. Fairhaven has a more “town” flavor, with larger lots, a higher proportion of single family detached structures, and more open space than the city of New Bedford. Fairhaven has a mix of economic activities including retail, fishing, and resort activities. The majority of the community is made up of residential properties, with retail activity focused on Route 6 and the downtown area; fishing and ship yards focused on the harbor area between the hurricane barrier and the Route 6 bridge; and the resort area found on Sconticut Neck.

Fairhaven was incorporated in 1812. Fairhaven began as an agricultural community, which persisted from its settlement until the middle of the 19th century. At that point, the economy shifted to a focus on shipbuilding, whaling, and overseas trade. Albeit New Bedford may have been the busiest whaling port, Fairhaven was second in the
more than $0.5 million in whale products. When trade in whale products declined, due in part to the discovery of oil, other industries became important, especially The American Tack Company. Fairhaven became more suburban in character in the late 1870's when a rail line connected Fairhaven to New Bedford, and this character prevails to the present (www.state.ma.us/dchdlprofile/094.pd).

4.2.4.1.2 Geography

General

A map of Fairhaven in relationship to surrounding towns and cities is provided in Figure 6.

Distance to major cities

Fairhaven abuts the eastern boundary of New Bedford. The distance to Providence is approximately 35 miles, and the distance to Boston from Fairhaven is about 55 miles.

4.2.4.1.3 Governance

Fairhaven has a Board of Selectmen, which are elected. There is also an employed Executive Secretary. As opposed to the open town meeting, Fairhaven has a representative town meeting.

4.2.4.1.4 Services

Fairhaven provides water and sewer services, planning and development assistance, and dockage for fishing vessels.

4.2.4.1.5 Transportation

Air and rail

Air service is not available in Fairhaven. The nearest airport is in New Bedford, approximately six miles from Fairhaven. Major air service is available through T. F. Green Airport in the Providence area, and through Logan Airport in Boston. The nearest commuter rail line is in Providence.

Highways

Interstate 195 and U. S. Route 6 both have segments within Fairhaven.

Maritime

During participant observation in 2002, several residents discussed a cruise ship
that may dock at Union Wharf in the future. At the present time, however, the maritime activities of Fairhaven are restricted to commercial fishing and recreational boating.

4.2.4.2 Port - New Bedford Harbor East Side

4.2.4.2.1 Description and Activities

Fairhaven’s waterfront is currently dominated by a mix of commercial fishing vessels and recreational vessels. Most of the marinas within the harbor are found on the eastern, or Fairhaven side, but the largest marina is actually operated by the City of New Bedford at Pope’s Island.

Near the Hurricane Barrier, there is a marina, which also docks commercial fishing vessels, and one of the two shipyards. Further north, the next wharves are associated with the Hathaway plant. This property was purchased by the Steamship Authority to become a maintenance facility for ferries that provide service to Martha’s Vineyard and Nantucket. North of this area is the other shipyard and Union Wharf, which is the town’s facility for docking fishing vessels. While most of the area is set aside for larger fishing vessels, mainly scallopers, there are also spaces for lobster vessels. A fish house is also located on the edge of the wharf. There are other wharves and a marina to the north of the shipyard, but south of the bridge. North of the Rt. 6 bridge, there is a small marina, serving only vessels of shallow draft. Waterfront activities, therefore, on the Fairhaven side of the harbor are located south of the Route 6 because of restrictive water depths.

4.2.4.2.2 Infrastructure

Fairhaven provides dockage and tie-up facilities for fishing vessels. In addition to public dockage provided by Fairhaven, there are numerous private companies related to commercial fishing. These include a shipstore, a gear provider, a propellor shop, two shipyards, a settlement house, and a once well populated, now lesser so, bar, which still serves as a fisherman’s hangout. Although no longer available on the Fairhaven side of the harbor, ice is available on the New Bedford side of the harbor. Fuel and lubrication materials are delivered from companies located on the New Bedford side of the harbor; deliveries are either by barge or truck. Educational services for Fairhaven fishermen are provided in New Bedford through the Fishing Family Assistance Center.

4.2.4.2.3 Port Concerns

Fairhaven port concerns focus on gentrification or conversion. Gentrification is seen as changing use for the Hathaway property along with the loss of the ice plant and the decision to dock a small cruise ship at Union Wharf. Informants have expressed concern that these may be signs of things to come. While these changes may somewhat alter the character of the port, they may be less of a problem if they are the only shifts. If this is the beginning of a change to more passenger transportation, there is a chance that fishing dock space may be reduced in Fairhaven.
Potential benefit to Fairhaven may accrue if U.S. 6 is re-routed toward the north, a proposal being studied by New Bedford and Fairhaven as a section of the Harbor Development Plan. At present, to get from Fairhaven to the New Bedford harbor, one runs a gamut of the draw bridge or a circuitous route, which has its own problems such as poor sight angles in intersections that may or may not have stop signs. A gear provider noted the difficulty in serving Fairhaven due to the poor roadway plan, and felt that improving access between the two communities would be beneficial for those like him.

4.2.4.3 Fairhaven Demographics

Fairhaven’s demographic information is provided in Table 4.

Racial and Ethnic Composition

Compared to both New Bedford and to Bristol County, Fairhaven is more dominantly white, and less diverse in terms of race. In terms of ethnicity by national origin, Fairhaven still has a high population of persons of Portuguese heritage, but more of English ancestry than New Bedford.

Age Structure

Fairhaven has stronger representation of older people than either New Bedford or Bristol County. Fairhaven’s population had a median age of 41.2, which is 5.5 years older than that of New Bedford. People under 18 years of age comprise 21.7% of the town’s population, and those over 65 years of age comprise 19.5% of the population.

Household Composition

Fairhaven had 6,622 households in 2000. Of these 6,622 households, 64.2% were family households, and 11% were female headed households. Fairhaven had a similar percentage of family households compared to the county and to New Bedford, but had a slightly lower percentage than the county of female headed households, and a much lower percentage of female headed households than New Bedford. Households with children comprised 30.3% and households with people over 65 years of age comprised 32% of Fairhaven’s total.

Employment Industries

According to the 1999 NAICS data from census, Fairhaven has a total of 393 establishments, employing some 5,889 people. Two large establishments, hiring between 500 and 999 employees, are in information and management of companies and enterprises. Another 15 establishments hire between 50 and 249 employees, five of which are retail trade, and four are healthcare and social assistance. Slightly over half of Fairhaven’s
establishments, 204, employ between 1 and 4 people. Retail trade, which includes some 67 establishments, accommodation and food service with 57 establishments, and construction with 51 establishments are the most represented.

Forestry, fishing, hunting and agriculture establishments comprise 20 of Fairhaven’s 393 establishments. All twenty are fishing establishments, whether for finfish or shellfish. Eighteen of these establishments hire between one and four employees; one employs 5-9; and an another employs 10-15 employees.

For fishing related industries, including ship building and repair, fish and seafood wholesale and ice manufacture comprise another 10 establishments. The two largest of these establishments, both in ship building and repair, employed between 20 and 49 people in March of 1999. Total employment from fishing and fishing related industries consisted of between 112 and 272 people in March of 1999. To be noted, however, is the loss of the ice plant in 2001 with the conversion of the former Hathaway dock.

4.2.5 Cape May County, NJ

4.2.5.1 Overview

The major economic base of Cape May county is recreation and tourism. In consultation with county officials, retail and other activities which might not necessarily be considered tourist related are considered so for Cape May County. The Cape May County Chamber of Commerce provides literature on available activities within the county, and the bulk of these brochures focus on hotels, restaurants, beach activities, recreational uses, ecotourism such as bird and wildlife watching, and party-charter/head boat fishing.

Fishing has long been prosecuted in the Cape May area, beginning with whaling, which was the occupation of the settlers of the Townbank village area of Lower Township on Delaware Bay. Fishing and crabbing as recreation, as well as for subsistence, goes back into the colonial era of the United States with the beginning of Cape May as an early resort for those from Philadelphia. In addition to fishing as recreation, fresh fish as desirable food was also advertised in association with recreating in early Cape May (Dorwart, 1996).

The Atlantic coastal areas of Cape May, Wildwood, Ocean City, and Sea Isle City are fairly urbanized with high density development and multi-story structures. These seaside locations provide most of the hotel and restaurant facilities within the county. The seaside cities are located on barrier islands or sand dune areas with marshy bays just inland. West from the marshes are agricultural and residential areas of Lower, Middle and Upper Townships.
Fishing is the second most important economic base of the county, following after tourism. While recreational fishing occurs from numerous localities within the county, commercial fishing is focused in Lower Township (but still on Cape May Harbor), and in the dock area of Wildwood. There is some bay fishing for blue crab and eels, but the sea fisheries prosecuted in the Atlantic are more important economically.

### 4.2.5.2 Geography

**Location map**

A map of Cape May County and its surroundings is depicted in Figure 8. A second map (Figure 9) depicts the localities within the county.

**Metropolitan Statistical Area**

Cape May County is the southern section of the Atlantic-Cape May Primary Metropolitan Statistical Area, and is also part of the Philadelphia-Wilmington-Atlantic City Consolidated Metropolitan Statistical Area, as determined by the Census Bureau.

**Distance to major cities**

Central Cape May County (Cape May Court House) is approximately 35 miles from Atlantic City, New Jersey. Philadelphia is approximately 80 miles from central Cape May County.

### 4.2.5.3 Governance

Cape May County is governed by a Board of Selected Freeholders. Five Freeholders are elected, with one serving as the Freeholder Director and another serving as the Vice Director. Other elected officials include the sheriff, county clerk, and the county surrogate (judge). The rules are made by the Freeholders, but the day-to-day decisions are handled by the County Administrator.

### 4.2.5.4 Services

Cape May County provides numerous services to its residents. The county has 44 departments, which handle issues about nursing homes, libraries, planning and public safety, and mosquito control. Cape May’s Department of Tourism handles the community and economic development activities including provision of funding for low interest revolving loans for fishing businesses to encourage increased employment within the county.

### 4.2.5.5 Transportation
Roads

The major highway that connects Cape May County with the rest of the United States is the Garden State Parkway, which begins just north of the City of Cape May.

Air and rail

Cape May County has a small airport located in Lower Township. Major airlines serve Philadelphia.

The only rail service available in Cape May County is an excursion line that runs from Cape May Court House to the Cape May City. The Seashore Lines is planning to continue from Cape May Court House to Tuckahoe where an interchange with NJ Transit will provide more continuous connections.
Figure 8. Cape May County and surrounding counties.
Figure 9. Municipalities in Cape May County.

Source: http://www.state.nj.us.dep/gis
Maritime

The Cape May-Lewes Ferry provides automobile and pedestrian services for crossing Delaware Bay to shorten the trip for those who are traveling north-south. Commercial vehicles also use the ferry to shorten trips. The ferry landing is in Lower Township on the Cape May canal.

4.2.5.6 Demography

Population

The county population, according to the 2000 census, was 102,326 people. Females outnumbered males by approximately 4%.

Racial and Ethnic Composition

Approximately 99% of Cape May County’s population identified themselves as being of one race. Of those who identified a single race, 91.6% of the total population identified themselves as white, 5.1% as black, and 0.6% as Asian. American Indians and Alaska Natives, some other race, and Native Hawaiian or other Pacific Islander made up approximately 1.5% in composite. Three and three tenths percent of the population classified themselves as Hispanic or Latino.

The vast majority of the residents of Cape May County at the time of the census were natives of the United States, comprising 96.8% of the population. Of the foreign born population, over half were born in Europe, with nearly 20% born in Asia, and another approximately 20% born in Latin America. Of the total foreign born residents, approximately one quarter entered between 1990 and 2000. Slightly less than half of the residents of Cape May County in 2000 were born in New Jersey. The largest declared ancestries are Irish (28.2%), German (21.7%), Italian (17.1%), and English (13.2%).

Age Structure

The median age of the county population is 42.3 years. People under the age of 18 comprise 12.3% of the population, and those over 65 years of age comprise 20.2% of the population.

Household Composition

Cape May County had 42,148 households in 2000. Nearly 65% of these households were family households, and 10.9% were female headed households. Of the total households, 30.2% are householders live alone. Households with individuals 65 years of age or older made up 34.4%. The average household size was 2.35 persons.
Cape May County had 92,047 housing units. Of these, 46.3 % were occupied, 53.7 % were vacant, and 47.4 % were for seasonal, recreational or occasional use. The homeowner vacancy rate was 2.5 % and the rental vacancy rate was 22.5 %. Of the occupied housing units, 74.2 % were owner occupied while renter occupied units made up the remaining 25.8 %.

The median value for owner-occupied units was $137,600, and the median monthly mortgage payment was $1,178. For renter occupied units, the median rent was $650 per month.

**Educational Trends**

Of those people 25 years of age or older, 4.6 % had less than a 9th grade education; 13.6 % had 9th to 12th grade educations, but no diploma; 81.9 % had a high school diploma or higher; and 22 % had a bachelor’s degree or higher.

**Income**

Per capita income in 1999 was $24,172 while the median household income was $41,592. Family income for the same period was $51,402. Individuals below the poverty level numbered 8,549 or 8.6 % of the population; 7.6 % were 18 years of age or older.

**Employment**

Cape May County in 2000 had a population of 81,988 people 16 years old or older. Of those people, 49,201 or 59.1 % were in the labor force. Of the population 16 years old or older, 54.3 % were employed, while 4.9 % were unemployed. Those unemployed people made up 8.2 % of the labor force, while employed people made up 91.8 % of the civilian labor force. The Armed Forces employ 719 people, or 0.9 % of the population 16 years of age or over.

**Employment Industries**

For people residing in Cape May County, the strongest occupational sector was that of management, professional and related occupations, which made up 31.5 % of those reported. The next largest sector was sales and office occupations, employing 27.3 % of the labor force. Farming, fishing and forestry occupations were the smallest sector of the workforce, employing 378 people or 0.8 % of the employed work force.

In considering employment from the aspect of jobs located within the county from the NAICS County Business Patterns for 1999 (U. S. Census Bureau), 24,960 people were employed. The industries employing the most people within the county were retail (22.2 %), accommodations and food services (20.0 %), healthcare and social assistance (15.1
4.2.6 Lower Township

4.2.6.1 Overview

The designation of this port as Cape May is something of a misnomer. In fact, the fishing docks are located within the borders of Lower Township and Wildwood, but both are within Cape May County, and the Lower Township docks are also on Cape May harbor.

Lower Township is a dominantly residential community located to the north of Cape May and mainly west of Wildwood. In addition to residential uses, Lower Township has a resort area in Diamond Shores between Cape May and Wildwood Crest, a shopping center in the area known as North Cape May, and commercial/shopping in the area of Villas, scattered agricultural uses, and commercial and recreational fishing focused on the north side of the Cape May harbor.

Wildwood is a resort community with numerous hotels and restaurants along the waterfront. In addition, Wildwood has a boardwalk with amusements to occupy visitors looking for games and rides. The Wildwood area has an urban density of development for most of its area and numerous shops also suggesting a more urban character. Little of the scallop fishery is landed at Wildwood, while the vast majority of landings are in Lower Township, and thus, Wildwood will not be discussed further as a fishing community for the purposes of this report.

From its settlement in 1631 until the early 1900s, Lower Township was predominantly an area of farming and fishing peoples. The county as a whole in the early 1800s had 70% of its population employed in these occupations. Cape May, then called Cape Island, was the main focus of early tourism and recreation activities. After 1900, real estate speculation began with the development of the harbor with congressional funding approved in 1907. Shortly thereafter, with World War I, came development of the harbor area for military uses. Between World Wars I and II, fishing came to be the predominant activity in the area. The largest fish plant in the country at that time was located in Cape May County. With World War II, military uses again became important, and further development of the harbor area with the construction of the canal was undertaken. In the postwar period, local planning officials noted that the area had shifted from farming and fishing as the base of its economy to tourism. (Dorwart 1996). In consultation with long term residents, it also appears that there is a long term decline in the importance of fishing. They recognize the period of the dominance of fishing as being sometime in the 1970s (within their lifetimes), and that since the early 1980s, tourism has become the major
economic emphasis in the area. Fishermen contend that restrictions on fishing due to regulation has also been a dominant factor in the decline of importance of fishing for the Cape May area.

4.2.6.2 Geography

General

An aerial photo of Lower Township and the surrounding area is provided in Figure 10. Like the towns in Maine described by Acheson (1988), Lower Township is made up of several villages, and when asked, residents identify themselves as living in the village as opposed to Lower Township.

Distance to major cities

Lower Township abuts the two most active areas of the county, Cape May City and Middle Township. While Cape May City is a major activity center for tourism and recreation, day-to-day shopping tends to occur in Middle Township in the areas of Rio Grande and Cape May Court House. Lower Township is approximately 45 miles from Atlantic City, and approximately 90 miles from Philadelphia.

4.2.6.3 Governance

Lower Township has a Council-Manager form of government. The Council is responsible for making ordinances, and the manager serves as the chief executive and administrator of the township.

4.2.6.4 Services

Lower Township offers services including water and sewer, police and fire service, recreational facilities, and oversees the elementary school.

4.2.6.5 Transportation

Air and rail

The Cape May County Airport is located in Lower Township. It has limited service. For passenger and cargo air service, the Philadelphia airport 90 miles away is the nearest major airport.

As noted for the county, the only rail service in the area is an excursion train. This train runs through Lower Township and has a stop at Historic Cold Spring Village.
Figure 10. Aerial photo of Lower Township and its surrounding areas at 32 m. resolution.

Highways

The Garden State Parkway runs north-south through the east central portion of Lower Township.

4.2.7 Port - Cape May Harbor

4.2.7.1 Overview and Activities

The harbor area is characterized more by recreational than commercial use. Marinas and recreational boating and fishing comprise greater area in terms of frontage upon the harbor than commercial fishing. Cape May is home to several major recreational fishing activities in terms of tournaments, and these bring both fishermen and money to the harbor. In addition to the fishing uses, there is a Coast Guard facility at the mouth of the harbor, which is the main training facility for the entire United States Coast Guard.

The state of New Jersey has a Coastal Area Facilities Review Act which requires permitting for development within the designated CAFRA zone, with an exemption for permitting under special circumstances. Of the areas in Cape May, only the dock area nearest the canal is exempted. The township’s planner discussed the local situation, and had tried to assist the owners of the Ocean Drive docks in gaining an exemption, but the state denied the exemption. The docks are somewhat scattered spatially. Four docks are located on Ocean Drive, three on one side of the channel, the fourth at Two Mile Landing, and the final area at Schellengers Landing (Figure 11).

Three of the docks on Ocean Drive are in operation, but one additional dock in this area went out of business in 2002. Of the three operating docks, two are under a single ownership, and the other is owned by another person. The docks on the west side of the channel have location to tie up vessels, process fish, and provide fuel and ice. There is also a major clam company plant located across Ocean Drive. The dock on the east side of the channel, in the area known as Two Mile Landing, also can provide some processing, and is associated with a waterfront restaurant and marina. Generally surrounding this area is an expanse of saltmarsh, with a number of marinas fringing the harbor area.

The dock at Schellengers Landing is located approximately two miles away from the docks on Ocean Drive, near the juncture of the harbor and the canal, which cuts between the Atlantic Ocean and the Delaware Bay. This dock location is associated with two restaurants, fish wholesaling and a retail fish market, processing, ice and fuel facilities, boat provisioning, and a fisherman’s wharf tour. At this location, adjacent uses include a marine railway, two gear businesses, marinas with charter/head/party boats as well as personal vessels, two whale watching businesses, bait and tackle shops, restaurants, higher density residences (condominiums), and some retail sales.

While the port has landings of several species of fish and shell fish, regulations and abundance of other species has seen a decline in their importance. Reliance on scallops as
the major product is exemplified by the comments of a lumper who stated “scallops are the only game in town.”

Infrastructure

As noted above, processing, ice and fuel are provided at the docks. These businesses are owned by the dock owner, who also is the processor, and in all cases is a boat owner as well. Vertical integration appears to be the rule for this locality. Although the dock owners are also boat owners, not all boat owners are dock owners. The general opinion is that the dock owners are providing a service to the other boat owners, and that it is appreciated.

The Cape May area has a marine railway and two gear providers in addition to the docks. Wholesale and retail sales for fish are also found locally, with some of the sales through retail operations adjacent to the docks.

In contrast to New Bedford, the locality provides few services for the fishing industry. The only service that was offered in addition to those of the general public (for example, roads or emergency services) is through a loan that is available for any business located in the township and provides jobs as a result. Generally the fishing industry does not use this loan because the county provides a loan specifically intended for fishing businesses with a higher cap. The county loans are provided through the Department of Tourism, and reviewed and approved, or rejected, by a board that is made up of fishermen and interested parties including bankers, and fishery scientists.

Port concerns

Both the director of the Department of Tourism for the county and a local boat owner described an issue for fisheries in the area. Apparently, there is a problem getting ice in a reasonable time frame for someone who is attempting to offload and then undertaking a second trip in short order. The county official phrased it that “ice is a hot commodity,” and that the county is attempting to ensure that people who come in for loans consider the potential for owning or upgrading an ice plant. The boat owner stated that in the summer “it can take up to a week to get ice,” and that the dock operators tend to provide for their vessels first. He said “I understand - it’s business, they look after their own first,” but it can make life difficult for those who don’t fish on the vessels owned by the dock owners.

Other concerns are longer term. There is a level of conflict between recreational and commercial fishermen. While one of the local scientists has been given to understand that the Cape May area’s recreational fishermen are more accepting of the commercial fishermen, at least one recreational fisherman for marlin (a teenager) when hearing of the study of commercial fishermen blurted out “good, get rid of ‘em all.”
Figure 11. Aerial Photo of Cape May Harbor.

Source: USGS Terraserver, 8 m resolution (http://terraserver.homeadvisor.msn.com/image.aspx).
In addition to the competition between recreational and commercial interests, there is also a fair amount of gentrification along the harbor areas near Schellengers Landing. There are condominiums on both the Cape May and Lower Township sides of the harbor, and not all people residing in the condominiums may be receptive to the sounds of diesel engines at early hours.

At present the people who own and work at Schellengers Landing have taken advantage of the tourists' visits, and viewing the vessels while eating seafood has become a necessity for some travelers. In addition, this location has a place for recreational vessels to tie up for those who come to dinner by boat.

4.2.7.2 Lower Township Demographics

Table 5 offers Cape May County and Lower Township demographic characteristics for comparison.

In general, Lower Township makes up approximately one sixth of the county's residents. It is slightly less diverse than the county as a whole with a higher percentage of white people. The distribution of age cohorts is similar for the adults between the ages of 25 and 65, but Lower Township has a slightly higher percentage of people under the age of 18.

At the household level, Lower Township has more family households than the county overall, and it has fewer households with individuals over 65 years of age. If one considers that those over 65 may be widows or widowers living alone, the composition in terms of age for the county may explain the difference.

The county has a higher educational attainment level in general, with a higher percentage of both high school and college graduates. Lower Township has a higher population of those with 9th to 12th grade levels of attainment, but without diplomas.

Lower Township residents earn approximately 10% less in incomes; this applies to both the median household and the median family incomes of the county. Despite the lower incomes, Lower Township has a lower rate of persons in poverty than the county.

In consideration of employment, Lower Township has a somewhat higher unemployment rate than the county. The distribution of types of employment is generally similar, but the rate of employment in farming, fishing and forestry is nearly double for Lower Township than for the county.

Employment Industries

The U. S. Gazetteer lists four zip codes for Lower Township. They include 08204 (Cape May), 08242 (Rio Grande), 08251 (Villas) and 08260 (Wildwood). These communities have numerous additional businesses that are not in Lower Township per se,
but due to their inclusion via the census data, they are used for this data set.

In March of 1999, there were a total of 1,865 establishments employing 10,691 people in the four zip codes. The largest number of establishments are in accommodation and food services with 599 establishments; there are also 352 retail establishments and 158 construction establishments within the four zip codes. None of the employers were extremely large, but several employ between 100 and 249 persons. The sectors with establishments in that size category are education, construction, wholesale, accommodations, retail trades, other services and arts, entertainment and recreation. The largest employer in fish related businesses is a canner that employed between 50 and 99 people in 1999.

In these four zip code area, there are 22 fishing establishments, one fish processor, four fish wholesalers, and three retailers. Two fish and shellfish wholesalers employ between 20 and 49 people. One fishing establishment hires between 10 and 19 people with six of the remaining establishments hiring between 5 and 9 people, and the rest hiring between 1 and 4 people.

4.2.7.3 Cape May Fishing Community

Cape May is a moderately sized fishing community. Permit data from NMFS shows that 126 vessels list Cape May as their primary port. Of these, 48 vessels hold limited access scallop permits. There is a diversity of gear used by those who hold scallop permits. According to the permit data by gear type, 26 vessels are permitted for scallop dredges, three use the small dredge, and nine use trawl gear. In Cape May Harbor, the fishing community is small enough that most people know who's who, which vessels they work on, and where those vessels tie up. In addition to fishermen, boat owners, dock owners and processors, the Cape May community has two gear suppliers and a boat yard. Cape May also has a large recreational fishing community, but due to the fact that scallops are harvested only by commercial vessels in this area, little discussion of the recreational fishing community ensues in this description.

Although numerous transient vessels offload at the Cape May docks, the core of Cape May fishermen tend to come home with their catches. Cape May is midway along the east coast, and vessels from both north and south are reported to land there. During the periods of participant observation (i.e., living in the community and observing activities), several vessels from North Carolina and Virginia were observed to be offloading scallops. Few, if any vessels were observed to be from areas farther north. A few vessels from the south, mainly from North Carolina, come up for the entire summer and return south for the winter. Only one scalloper is known locally to go north and land in New Bedford regularly, but even he doesn’t dock there; he docks in New York. Those who are more permanent residents discussed reasons that they come home with the catch.
Table 5. Demographic indicators for Cape May County and Lower Township

<table>
<thead>
<tr>
<th></th>
<th>Cape May County</th>
<th>Lower Township</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>120,326</td>
<td>22,945</td>
</tr>
<tr>
<td>% male</td>
<td>48.1</td>
<td>47.5</td>
</tr>
<tr>
<td>% female</td>
<td>51.9</td>
<td>52.5</td>
</tr>
<tr>
<td><strong>Racial and Ethnic Composition(%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>one race</td>
<td>98.8</td>
<td>99.1</td>
</tr>
<tr>
<td>white</td>
<td>91.6</td>
<td>96.3</td>
</tr>
<tr>
<td>black/African American</td>
<td>5.1</td>
<td>1.4</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Asian</td>
<td>0.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>some other race</td>
<td>1.3</td>
<td>0.7</td>
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<tr>
<td><strong>Hispanic or Latino</strong></td>
<td>3.3</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Ancestry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irish</td>
<td>28.2 %</td>
<td>32.0%</td>
</tr>
<tr>
<td>German</td>
<td>21.7%</td>
<td>24.8 %</td>
</tr>
<tr>
<td>Italian</td>
<td>17.1%</td>
<td>16.6%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>median age (years)</td>
<td>42.3</td>
<td>41.8</td>
</tr>
<tr>
<td>% under 18 years</td>
<td>22.3</td>
<td>23.7</td>
</tr>
<tr>
<td>% 65 year or over</td>
<td>20.2</td>
<td>20.7</td>
</tr>
<tr>
<td><strong>Household Composition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total households</td>
<td>42148</td>
<td>9328</td>
</tr>
<tr>
<td>% family household</td>
<td>64.9</td>
<td>68.4</td>
</tr>
<tr>
<td>% female headed households</td>
<td>10.9</td>
<td>11.7</td>
</tr>
<tr>
<td>% households with children under 18</td>
<td>28.6</td>
<td>31</td>
</tr>
<tr>
<td>% households with individuals over 65</td>
<td>34.4</td>
<td>1.5</td>
</tr>
<tr>
<td>average household size</td>
<td>2.36</td>
<td>2.43</td>
</tr>
<tr>
<td><strong>Education</strong> (% of population over 25 years of age)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>2010</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>% less than 9th grade</td>
<td>4.6</td>
<td>4.3</td>
</tr>
<tr>
<td>% 9th to 12th grade, no diploma</td>
<td>13.6</td>
<td>18.6</td>
</tr>
<tr>
<td>% high school graduate or above</td>
<td>81.9</td>
<td>77</td>
</tr>
<tr>
<td>% bachelors degree or above</td>
<td>22</td>
<td>13.1</td>
</tr>
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**Income**

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>median household income</td>
<td>41,591</td>
<td>38,977</td>
</tr>
<tr>
<td>median family income</td>
<td>51,402</td>
<td>45,058</td>
</tr>
<tr>
<td>% below poverty level</td>
<td>8.6</td>
<td>7.7</td>
</tr>
<tr>
<td>% 18 years and over below poverty level</td>
<td>7.6</td>
<td>6.7</td>
</tr>
</tbody>
</table>

**Employment**

<table>
<thead>
<tr>
<th></th>
<th>2000</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>population over 16</td>
<td>81,988</td>
<td>18,068</td>
</tr>
<tr>
<td>labor force (#/% population &gt;16)</td>
<td>49,201 / 60.0</td>
<td>10,648 / 58.9</td>
</tr>
<tr>
<td>unemployed civilian (% labor force)</td>
<td>8.2</td>
<td>9.9</td>
</tr>
<tr>
<td>Armed Forces (% population &gt;16)</td>
<td>0.9</td>
<td>0.7</td>
</tr>
</tbody>
</table>

**Employment Industries**

<table>
<thead>
<tr>
<th>occupational sector (%)</th>
<th>2000</th>
<th>2010</th>
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</thead>
<tbody>
<tr>
<td>management, professional and related</td>
<td>31.5</td>
<td>23.9</td>
</tr>
<tr>
<td>service occupations</td>
<td>21.1</td>
<td>24.1</td>
</tr>
<tr>
<td>sales and office occupations</td>
<td>27.3</td>
<td>27.7</td>
</tr>
<tr>
<td>farming, fishing and forestry</td>
<td>0.8</td>
<td>1.4</td>
</tr>
<tr>
<td>construction, extraction and maintenance occupations</td>
<td>11.2</td>
<td>13.7</td>
</tr>
<tr>
<td>production, transportation, and material moving occupations</td>
<td>8</td>
<td>9.2</td>
</tr>
</tbody>
</table>

**NAICS 1999 employment by industry based on location of establishments**

<table>
<thead>
<tr>
<th>Industry</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>agriculture, forestry fishing and hunting,</td>
<td>90</td>
</tr>
<tr>
<td>mining</td>
<td>20-99</td>
</tr>
<tr>
<td>utilities</td>
<td>100-249</td>
</tr>
<tr>
<td>construction</td>
<td>2,222</td>
</tr>
<tr>
<td>manufacturing</td>
<td>781</td>
</tr>
<tr>
<td>services</td>
<td>21,324-22,439</td>
</tr>
</tbody>
</table>
One reason is due to the fact that dock owner/processors are also vessel owners. These owners need to maintain both properties, so the vessels come home to provide product for the processor. This practice may be seen as negative by some individuals, but the dock owners are consolidating economic power, and there may be a decrease of flexibility. One captain who had owned a vessel in the past said “I used to come home and then be responsible for the boat. Now if something happens, I come in and tell ‘em ‘it’s broke; I’m not responsible for getting it fixed.” Another fisherman when considering the possibility of moving to another port to fish for a prolonged period said “I’d hate that. I like knowing I’m coming home.”

A final reason that the vessels come to Cape May is the ease of regathering the crew. The same captain who talked above said “you land and stay somewhere else, you have to hunt up your crew. At home you know where to find them.”

With regard to ethnicity, all of the dock owners are white. Like New Bedford, most of the boat owners are white Yankees. One exception is a fleet owner who is Vietnamese. The vessels are referred to locally as “the Vietnamese Navy.” Captains and crews are mixed in terms of race and nationality. The captains interviewed were white, but some of the vessels were entirely staffed by African-Americans. In addition to these groups, some Mexicans were found on vessels from Cape May, and recently, there was an influx of young Russian people, who have been working for the resort activities, but are now looking for work in commercial fishing.

Two major processors on Ocean Drive hire people who in New Bedford would be considered “Mayan.” McCay and Cieri (2000) note that the Mexican population resides in one of the nearby counties. On the docks, those who lump and drive trucks appear to be mostly Yankees. At one of the docks, those at Schellenger’s Landing, it is a bit difficult to determine who is working for the restaurant and who works the docks, but it appears that the Mexican people who work in the area are working for the restaurant.

Most of the fishery participants live in southern Cape May County. Several of the boat owners live in North Cape May which is part of Lower Township, while others live in the City of Cape May. In addition to the Cape May area, one major owner stated that a few of the fishermen come from as far away as Philadelphia. Finally, an informant from Rockland, Maine indicated that about 30 fishermen from Rockland travel as far as Cape May to meet their vessels.

It is becoming increasingly difficult for boat owners to find crew in the Cape May area. This is due to an influx of vessels, largely under the ownership of the major fleet owners, and a lack of individuals desiring to be a crew member.

There are two fisheries organizations associated with Cape May. The first is the Garden State Seafood Association, and the other is the Cape May Seafood Association. The fleet owner/processors all are members of the organizations, but both organizations are perceived by both fishermen and local citizens to be affiliated with a single boat.
owner/processor. When discussing management issues with a captain, crew, dock
foreman and lumpers on one of the docks, they indicated that they were typically excluded
from discussions about fishery management issues. One fleet owner/processor stated “tell
us what they want us to know.” The employees apparently do not feel free to offer
suggestions and ideas for improving management.

The larger fleet owners expressed a strong preference for ITQs, much like their
counterparts in New Bedford. In various conversations with the larger fleet owners, they
indicated there was a strong need for improving efficiency and having fewer vessels that
could work more days. However, the Cape May vessel owners, including the fleet owners
have agreed with the FSF to see that any additional closures were small in size, tend to be
areas that are not producing most of the current product, and had guaranteed re-openings.
The owner-operators tend to defer to FSF’s positions saying “they know more about
management than I do.”

4.2.8 York County, VA

4.2.8.1 Overview

York County, Virginia, has a long history beginning with the settlement by the
English and the development of the country. Just a few miles away, at Jamestown, the
settlement of the United States began in earnest. Yorktown, within the county, is the site
at which the British under General Cornwallis surrendered, which ended the Revolutionary
War. Revolutionary War and Civil War earthworks are found in the area. Presently, York
County is primarily a suburban area, with nearly 36% of the county held by the federal
government—mainly by the Navy and the Coast Guard, but also with properties owned by
the National Park Service.

In Virginia, there are no cities within the counties. If a county exists, it is the most
local form of government recognized. Cities are independent of counties and are
considered county equivalents both by the U. S. Bureau of Census classifications and in
terms of provision of service and delegated authority.

York County is part of the greater Hampton Roads area. It is adjacent to Hampton,
Newport News, and Williamsburg. The Virginia tidewater area, also known as Hampton
Roads, is well known for its emphasis on the military, the resources of the Chesapeake
Bay, and for tourism based on the local history. Despite its proximity to the two larger
cities, Seaford was considered distinct in terms of the population’s demographic
characteristics, particularly age and ethnicity, and income characteristics.

While the area has numerous museums that interpret the local area’s importance
during the Revolutionary and Civil Wars, the county also has a Waterman’s Museum.
Much of the focus of that museum is on older or historical technologies and vessels, but
this museum was the only one of those visited in the four communities that had an exhibit
specifically on scalloping.
4.2.8.2 Geography

Location map

A map of York County and its surrounding areas is shown in Figure 12.

Metropolitan Statistical Area(s)

York County is part of the Norfolk-Virginia Beach-Newport News Metropolitan Statistical Area.

Localities within the county

As noted above, no incorporated cities or towns are found in York County. Informally, several areas are recognized including Seaford, Dandy, Grafton, and Yorktown.

Distance to major cities

York County abuts both Newport News and Hampton, VA. Norfolk is approximately 40 miles to the south, Richmond is approximately 65 miles to the northwest, and Washington, DC is approximately 150 miles north.

4.2.8.3 Governance

York county is governed by an elected Board of County Supervisors. There are five supervisors, one of whom serves as the chairman, and another who serves as vice chairman. The Board of Supervisors is the governing board of the county, but the County Administrator handles county administration and management.

4.2.8.4 Services

York County provides services to the people of the county including schools, garbage collection and recycling, mosquito control, economic development, libraries, senior services, courts, animal control, emergency services (police, fire, and ambulance), recreation services, and the county coordinates water and sewer services for portions of the county.

4.2.8.5 Transportation

Roads

The major highway connecting the Hampton Roads area to Richmond and to Interstate 95 is Interstate 64. Interstate 64 runs through York County. U. S. Route 17 also runs through York County, providing access to Newport News to the south and Gloucester...
County to the north.

Air and rail

Air service is available through one of three airports. The closest is the Newport New-Williamsburg International Airport in Newport News which abuts York County. This airport provides somewhat limited passenger service. For additional services, both cargo and passenger, Norfolk International Airport is approximately 40 miles south, and Richmond International Airport is approximately 65 miles northeast.

CSX provides rail service for freight transport to parts of the county. Amtrak provides passenger service with stations in Newport News and Williamsburg.

Maritime

York County has no major commercial ports for general shipping of freight, but maritime uses of the area include shipment of oil products, recreational, commercial fishing and naval activities. There is a BP Amoco refinery which ships in oil for refining at the mouth of the York River. The Naval Weapons Station takes up much of the waterfront on the York River, and the Coast Guard station is located near the mouth of the York River. There are marinas for recreational vessels. Commercial fishing is located in Seaford with the presence of two scallop companies and associated docks, but commercial crabbing and clamming occurs in the Chesapeake Bay and vessels tie up either at the private docks or at the marinas. Occasional cruise vessels visit the waters of the York River, and at the Waterman’s Museum excursion tours are offered. Substantial cargo handling capacity is available at the Port of Virginia, with locations in Newport News and Norfolk.

4.2.8.6 Demography

Population

York County is the smallest county examined in this study. It has a population of 56,297 people in 2000. The proportion of males and females is nearly equal, with 49.1% male and 50.9% female.
Figure 12. Selected counties and independent cities of southeastern Virginia. Note the location of York County, and the cities of Hampton and Newport News.
Racial and Ethnic Composition

Ninety eight percent of the population of York County self identified as being members of one race. Of these, 80 % are white, 13.4 % are black, and 3.2 % are Asian. The remaining racial groups, American Indian and Alaska Native, Native Hawaiian and other Pacific islander, and some other race total 1.3 %. Two percent of the population described themselves as being members of two or more races. Hispanic people make up 2.7 % of the population.

Nearly 95 % of the population are native born citizens of the United States, with 39.5 % born within the state. Of the foreign born, 27.6 % entered between 1990 and March of 2000. Nearly half of the foreign born population originated in Asia, with approximately 32 % from Europe and 12.8 % from Latin America. The largest categories of declared ancestries is other with 26.9 %, English (15.8 %), German (15.7 %), Irish (12.1 %), United States or American (10.1 %).

Age Structure

The median age for York County’s population is 36.5 years. People under the age of 18 make up 29.1 % of the population, and people 65 years of age or older comprise 9.1 % of the population.

Household composition

According to the 2000 census, there were 20,000 households in York County. Family households made up 79.4 % of total households with 9.4 % of households headed by a female householder. Householders living alone comprised 16.7% of the total households, and of the total households, 5.4 % were non family households with householders 65 years of age or over. Households with children under the age of 18 made up 44.9 % of the total households, while households with people 65 years of age or older made up 18 % of households. The average household size was 2.78 persons.

York County had 20,701 housing units in 2000. Of these, 20,000 (96.6 %) were occupied housing units, while 3.4 % were vacant housing units. Only 0.4 % of the housing units in the county are designated as seasonal, recreational, or occasional use. The area is characterized by low vacancy rates, with the homeowner vacancy rate at 1.3 % and the rental vacancy rate at 2.7 %. Owner occupied units comprised 75.8% of occupied housing units with the remaining 24.2 % as renter occupied units.

The median value for owner occupied units in York County was $152,700, and the median monthly mortgage payment was $1,233. For renter occupied units, the median rent was $708 per month.

Educational Trends
The population of individuals 25 years of age and older totaled 36,168 persons in 2000. Of this population, 2.6% had an educational attainment of less than 9th grade, 5.7% had 9th to 12th grade attainment but no diploma, 91.7% were high school graduates or higher, and 37.4% held bachelor’s degrees or higher.

Income

Per capita income in 1999 was $24,560; median household income was $57,956, and median family income was $64,892. York County had 1,947 people or 3.5% of the population below the poverty level in 1999 with 3.3% being 18 years of age or older.

Employment

In York County in 2000, 41,855 people were 16 years of age or over. Of this group, 29,669 or 70.9% were in the labor force. For the labor force participants, 2.8% were unemployed while 60.8% of the population 16 years of age or over were employed in the civilian labor force. The Armed Forces membership comprises 3,501 people or 8.4% of the residents 16 years of age or over.

Employment Industries

For people residing in York County, the strongest occupational sector is management, professional and related occupations (45.9%), with sales and office occupations next strongest (24.3%). Farming, fishing, and forestry occupations provided employment for 77 residents of the county, or 0.3% of the employed population 16 years of age or over.

From the perspective of jobs located in the county, the 1999 County Business Patterns of the U.S. Bureau of Census found 13,521 people employed by 1,181 establishments. The highest levels of employment were in retail trade (18.8%), accommodations and food services (15.8%), arts, entertainment and recreation (between 7.3 and 18.5%), and construction (13.4%). Forestry, fishing, hunting and agriculture support employed between 20 and 99 people, which accounts for between 0.14 and 7.3% of the jobs in the county. To be noted, however, is the fact that the NAICS data considers those employed by establishments and excludes those who are self-employed.

While there is an apparent low dependency on fishing in the community, the county’s Economic Development department lists the sea scallop businesses and the associated cold storage facility jointly as among the largest employers in the county (http://www.yorkdevelopment.com/indstry/top_employers.asp).

4.2.9 Seaford, VA

4.2.9.1 Overview
In terms of governance and organization, Seaford is much more like a neighborhood than a city or town. The area has no governmental organization other than at the county level, and it has no official boundaries. The area is somewhat isolated from other unincorporated communities of York County. It is separated from Dandy, also known as Goodwin Neck, by Back Creek, and there does seem to be some distinction between the Seaford area and Grafton.

Seaford is off the main roads of the county, about five miles from U.S. Route 17. The area is between suburban and rural in development intensity. More recent developments have a suburban density, but older areas have a rural character with larger lots and older, often smaller homes.

The main business area has a small grocery store, post office, churches, and an elementary school, which are all located on Seaford Road. A secondary business area is found along Back Creek and consists of the scallop port, a welding shop, a restaurant, and a small marina.

Prior to European settlement, the area of Seaford was populated by Native Americans. With settlement, the Seaford area was patented to several owners, but three plantations, Back Creek, Cheeseman, and Bay Tree were all located on Crab Neck (Stall 2001). While fishing did occur, it was secondary to farming in the area until technologies improved making fishing more economically reliable. Back Creek was once a focus for crab vessels and pound netters, but more recently, crabbing has declined. Stall (2001) notes that now few people in the area work on the water as was done in the past, but mentions that the scallop companies continue the tradition of fishing in the area.

4.2.9.2 Geography

General

Local people recognize Seaford as the area located on Crab Neck, between Back Creek and Chisman Creek and between Goose Creek and the marshy area between Claxton Creek and Bay Tree Creek (Stall, 2001).

A map of the area is provided in Figure 13. Note that the endmost area of the neck, Bay Tree Island, is not considered by the local people to be part of Seaford. Despite local definitions, that area is considered part of the census tract and zip code area for Seaford by the U. S. Bureau of Census.

Distance to major cities

Seaford is approximately 7 miles from Newport News and approximately 15 miles from Hampton. From Seaford, it is approximately 45 miles to Norfolk and 155 miles to Washington, DC.
4.2.9.3 Governance

Seaford is an unincorporated area and has no governance as a city or town. As stated earlier, the most local level of governance for this area is the county level government.

4.2.9.4 Services

The only services are those provided at the county level or above. The services provided by the county are previously listed in the section on the county.

4.2.9.5 Transportation

Air

Air service is available approximately 7 miles away at the Newport News - Williamsburg Airport.

Highways

The major route in and out of Seaford is Seaford Road which connects the locality with U.S. Route 17 via a connection to Goodwin Neck Road.

Rail

Passenger rail service is available via Amtrak at stations at Newport News and Williamsburg. Freight rail is available north of Seaford in the area of the refinery and power plant.

4.2.10 Port

The port is localized in a small location near the mouth of Back Creek. An aerial photo of the area is shown in Figure 14. It serves two companies that share local facilities. Processing (packing and shipping), ice, cold storage and wholesale marketing is undertaken at the location. In the past, neighbors had some complaints with regard to the plant (McCay and Cieri 2001), but now there seems to be little conflict. Surrounding uses are dominantly residential, but there are two marinas and a welding shop on the creek. The location that provides retail sales of products from this location are found in Grafton at a fishing supply and seafood store on U. S. Route 17.

Infrastructure

The area provides ice, packing, shipping, cold storage, and wholesale scallops in addition to docks and some ship repair at the welding shop. All these facilities are privately owned.
Figure 13. Map of the Seaford area of York County from USGS 16 m resolution

Port concerns

As noted earlier, there had been some concern about "conflicting uses" with the docks and the nearby residential uses in the past. Of the companies visited, this location is well maintained and among the tidiest observed during the course of the project. In discussion with planning officials at the county, the conflict appears to be settled. However, without the conflict, the county planning official was largely ignorant of the fact that a major port for sea scallops was located in the county. The general attitude towards fishing was negative from this official; the official indicated that he was familiar with conflicts regarding crab catches that have been declining, and a conflict with the state level of fisheries management. The official also indicated that he perceived enforcement of the scallop fishery to be inadequate, but later changed his opinion when informed of current monitoring and enforcement through the use of vessel monitoring systems.

4.2.10.1 Demography

Table 6 provides Seaford and York County’s demographic characteristics for comparison. Approximately 6% of the York County population resides within the zip code that most closely represents Seaford. The Seaford area has a higher percentage of Caucasians and a lower percentage of population of blacks and Hispanics. The median age of the population of Seaford is approximately 5 years older than that of the county, and the population of Seaford has a higher percentage of people over 45 than does the county.

While there are similar percentages of family households, Seaford has a lower percentage of households with children. It does, however, have a higher percentage of households with individuals 65 years of age or older.

4.2.10.2 Seaford Fishing Community

In Seaford, VA, the fishing community is rather small. Twenty-two vessels list Seaford as their primary port, and 19 of those hold limited access scallop permits. All the vessels use the same gear, which is the scallop dredge. One company provides the docks, ice, gear, supplies, cold storage, and wholesale sales. This company shares office space with another. Four boat owners come into Seaford, one of whom is also the owner of the docks. There is a welder who works on the vessels that is located nearby.

Two of the boat owners are white and the other two vessel owners are second generation Mexican-Americans. The captains and crews are a mix of whites, blacks, Asians, and Mexicans. Few if any of the fishing community members reside in York County or Seaford. Seaford is such a small fishing community that the members know each other by face and name.
Figure 14. Seaford, Virginia (aerial 8 m resolution DOQQ from USGS TerraServer).
One of the boat owners serves on the Mid-Atlantic Fisheries Management Council and provides information back and forth between the council and others in the fishing community of Seaford. Although the New England Council has primary responsibility for managing and regulating the sea scallop fishery, the Mid-Atlantic Council has review authority for fisheries in the area but under primarily managed by other councils. In addition, the Fishery Management Plan (FMP) for sea scallops is a collaborative effort between the New England, Mid-Atlantic, and South Atlantic fishery management councils.

4.2.11 Hampton Roads, VA

The Hampton Roads area of Virginia is an area which is regional in geographic context. In the general use of the term, the cities of Virginia Beach, Norfolk, Suffolk, Hampton, Portsmouth, Chesapeake, and Newport News are considered the Hampton Roads region often with the addition of the cities of Poquoson and Williamsburg, and the counties of York, Isle of Wight, James City, Gloucester and Matthews. For the purposes of this study, however, attention is restricted to the cities of Hampton and Newport News.

4.2.11.1 Hampton, VA

4.2.11.1.1 Overview

Hampton, Virginia is a city of nearly 150,000 people. The city has diverse areas and land uses in part due to its expansion by annexation in the early 1950s. The former city of Phoebus and the former Elizabeth City County now comprise neighborhoods in the current city of Hampton. Of interest is the regional aspect of the area in that there is a substantial amount of coordination between Hampton and the other Hampton Roads communities for transportation, planning, sewage, and economic development. At one point in recent history, there was even consideration of the cities annexing and becoming one large city, but the concept did not gain acceptance.

Hampton has determined to develop its downtown to have a strong tourist and retail emphasis. This area was at one time in the past a major focus of fishing activity, but now has hotels, museums, and marinas. While possibly more aesthetically appealing, this gentrification has limited the further development of fishing activities in Hampton.

The city of Hampton promotes itself as having the highest concentration of people with advanced degrees in science and technology in the United States. This is due to the presence of military contractors and the facilities at Langley Field, which include a NASA installation. In front of City Hall is a sculpture entitled “From the sea to the stars,” (the city motto) which has a man with face upturned, a net in one hand, and reaching for the sky with the other.
Table 6. Demographic indicators for York County and Seaford, VA

<table>
<thead>
<tr>
<th></th>
<th>York County</th>
<th>Seaford (zip code 23696)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>57,297.00</td>
<td>3,441.00</td>
</tr>
<tr>
<td>% male</td>
<td>49.10</td>
<td>49.80</td>
</tr>
<tr>
<td>% female</td>
<td>50.90</td>
<td>50.20</td>
</tr>
<tr>
<td><strong>Racial and Ethnic Composition(%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>one race</td>
<td>98.00</td>
<td>99.20</td>
</tr>
<tr>
<td>white</td>
<td>80.00</td>
<td>94.20</td>
</tr>
<tr>
<td>black/African American</td>
<td>13.40</td>
<td>3.40</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
<td>0.30</td>
<td>0.40</td>
</tr>
<tr>
<td>Asian</td>
<td>0.70</td>
<td>0.80</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>0.10</td>
<td>0.00</td>
</tr>
<tr>
<td>some other race</td>
<td>0.90</td>
<td>0.30</td>
</tr>
<tr>
<td><em>Hispanic or Latino</em></td>
<td>2.70</td>
<td>1.60</td>
</tr>
<tr>
<td><strong>Ancestry</strong></td>
<td>Other Ancestries26.9%</td>
<td>English 17.5%</td>
</tr>
<tr>
<td></td>
<td>English 15.8%</td>
<td>U. S. or American 16.2%</td>
</tr>
<tr>
<td></td>
<td>German 15.7%</td>
<td>Other Ancestries 13.3%</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>median age (years)</td>
<td>36.50</td>
<td>41.20</td>
</tr>
<tr>
<td>% under 18 years</td>
<td>29.10</td>
<td>24.60</td>
</tr>
<tr>
<td>% 65 year or over</td>
<td>9.10</td>
<td>12.40</td>
</tr>
<tr>
<td><strong>Household Composition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total households</td>
<td>20,000.00</td>
<td>1,290.00</td>
</tr>
<tr>
<td>% family household</td>
<td>79.40</td>
<td>78.10</td>
</tr>
<tr>
<td>% female headed households</td>
<td>9.40</td>
<td>6.00</td>
</tr>
<tr>
<td>% households with children under 18</td>
<td>44.90</td>
<td>36.70</td>
</tr>
<tr>
<td>Category</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>% households with individuals over 65</td>
<td>18.00</td>
<td>23.00</td>
</tr>
<tr>
<td>Average household size</td>
<td>2.78</td>
<td>2.61</td>
</tr>
<tr>
<td><strong>Education (% of population over 25 years of age)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% less than 9th grade</td>
<td>2.60</td>
<td>3.10</td>
</tr>
<tr>
<td>% 9th to 12th grade, no diploma</td>
<td>5.70</td>
<td>6.90</td>
</tr>
<tr>
<td>% high school graduate or above</td>
<td>91.70</td>
<td>25.50</td>
</tr>
<tr>
<td>% bachelors degree or above</td>
<td>37.40</td>
<td>18.00</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median household income</td>
<td>57,956.00</td>
<td>64,392.00</td>
</tr>
<tr>
<td>Median family income</td>
<td>64,892.00</td>
<td>72,431.00</td>
</tr>
<tr>
<td>% below poverty level</td>
<td>3.50</td>
<td>3.30</td>
</tr>
<tr>
<td>% 18 years and over below poverty level</td>
<td>3.30</td>
<td>3.10</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population over 16</td>
<td>41,855.00</td>
<td>2,671.00</td>
</tr>
<tr>
<td>Labor force (#/% population &gt;16)</td>
<td>29,669 / 62.5</td>
<td>1,830/68.5</td>
</tr>
<tr>
<td>Unemployed civilian (% labor force)</td>
<td>2.80</td>
<td>1.90</td>
</tr>
<tr>
<td>Armed Forces (% population &gt;16)</td>
<td>8.40</td>
<td>4.80</td>
</tr>
<tr>
<td><strong>Employment Industries</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupational sector (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management, professional and related</td>
<td>45.90</td>
<td>45.80</td>
</tr>
<tr>
<td>Service occupations</td>
<td>13.10</td>
<td>12.10</td>
</tr>
<tr>
<td>Sales and office occupations</td>
<td>24.30</td>
<td>21.00</td>
</tr>
<tr>
<td>Farming, fishing and forestry</td>
<td>0.30</td>
<td>0.80</td>
</tr>
<tr>
<td>Construction, extraction and maintenance occupations</td>
<td>7.30</td>
<td>12.40</td>
</tr>
<tr>
<td>Production, transportation, and material moving occupations</td>
<td>9.10</td>
<td>8.10</td>
</tr>
</tbody>
</table>
Hampton has a diverse population, nearly 50-50 African-American and white population. Hampton is also home to a historically black college, Hampton University. Hampton is also the home of the festival “Bay Days,” which celebrates the local connection with the bay and its resources. Frey (1996) states that Hampton was once known as Crabtown (Frey 1996), and the city had problems with the odor for the scrap, which was processed for chicken feed. He further discusses Hampton and fisheries as “(s)ome think the problem is more political than technological. Other find it sociological with the fishery and industry in too many small competitive pieces, some operators not speaking to each other. Talk of cooperation usually come to nothing (p. 302).” Frey also notes that the local high school team is the Crabbers, but that fishing and crabbing are not fully welcomed in Hampton.

Hampton was settled in 1610 in Keocoughtan. During its early history, Hampton served as a trade center and port for cargo. During the Revolutionary War, the War of 1812, and the Civil War, Hampton became increasingly important for the protection of the Chesapeake Bay and later a guardian to a major route to Washington, D.C. (Williamson 1993). At the end of the Civil War, much of the local land area was not productive for food products, so for sustenance, locals began to more completely exploit the Chesapeake Bay. Hampton became a major center for seafood with processing of menhaden for oil, canning of crab, and shucking, canning and packing oysters (Stensvaag 1985). With the advent of urban redevelopment that commenced in the 1950s, and with more recent redevelopment, Hampton has undertaken to shake it’s “Crabtown” image (Frey 1996). While the city sponsors Bay Days as a celebration of the water and its heritage, the city’s planning districts appear to be squeezing out fishing related businesses, particularly in the downtown area.

### 4.2.11.1.2 Geography

#### General

As noted with respect to York County, the concept of cities and counties in Virginia is mutually exclusive. Cities are independent of counties for the Commonwealth of Virginia. Hampton is part of the Norfolk-Virginia Beach-Newport News Metropolitan
Statistical Area. A map of Hampton and the general area is provided in Figure 12.

Distance to major cities

Hampton abuts Newport News, and is across the James River from Norfolk. Richmond is 75 miles distant from Hampton, and Washington DC is 175 miles north.

4.2.11.1.3 Governance

Hampton has a city council made up of an elected mayor and six councilmen. The councilmen select the vice mayor. For administration and management, the council employs a city manager to handle day to day activities.

4.2.11.1.4 Services

Hampton provides the usual suite of urban services, including streets, coordinating with regional water and sewer, garbage collection, mosquito control, emergency services, policing, planning and economic development. In Virginia, cities also handle schools.

4.2.11.1.5 Transportation

Air and rail

There is no commercial air service in Hampton. Passenger service is available through the Newport New-Williamsburg Airport approximately 10 miles away. Both passenger and cargo service is available through the Norfolk International Airport about 10 miles away from the southern boundary of Hampton.

Both Norfolk Southern and CSX provide freight service in the City of Hampton. Passenger service is available at two Newport News stations approximately 10 to 12 miles away.

Highways

Interstate 64, the major regional highway runs through the City of Hampton.

Maritime

In the summer, there is active boat usage in Hampton with a cruise and a ferry.

4.2.12 Port

4.2.12.1 Description and Activities

The port area of Hampton is somewhat dispersed. In the downtown area, major
activities include recreational uses, commercial fishing, and some limited passenger traffic. While the major concentration of the harbor is near the downtown, not all the commercial docks are located there. One dock is located about two miles away near Phoebus, and another is located at the mouth of Sunset Creek. These locations are marked on the aerial photo in Figure 15.

The Phoebus location has had processing associated in the nearby area, but this has moved to Suffolk (roughly some 20 miles distant) due to conflicts over what people in Phoebus considered an unpleasant odor. In addition to the docks and packing of the product to the processing location, these owners also have a seafood restaurant adjacent to the dock area. Surrounding uses in the area include residences, antique and other retail stores, restaurants, and Fort Monroe military base.

The Sunset Creek location has docks, supplies, offices, shipping facilities, and fuel available. This location is surrounded by waterfront residences in the immediate area, but further up the creek is a small fish house. Where the creek meets the main street that leads into Hampton, there is a recreational boat dealership.

The downtown dock has a fish house, processing, ice, and shipping available. Surrounding uses include marinas, a gear supplier, a university extension office, a crab processor, a major museum, an historical carousel, upscale retail stores, the city visitors center, and a major hotel. A review of local planning and economic development documents suggests that this area is mostly designated for high tech and cultural uses; thus, the fishing industry will see little to no further development.

### 4.2.12.2 Infrastructure

In addition to the docks, Hampton’s port facilities also include gear suppliers, one of which is at the docks at Sunset Creek and the other at the downtown location, processing and packing facilities, ice, and a university extension location. Other than the university extension office, the facilities are all in private ownership.

### 4.2.12.3 Port concerns

While not expressed in interviews with the dock owners interviewed in Hampton, others in the Hampton Roads area have expressed concern that gentrification in Hampton will eventually take over the downtown port area for high tech or other development. Based on physical observations of the downtown area, it is particularly difficult for trucks to get around the school buses that park on the streets around the large museum. If user conflict occurs between these uses of the roadway, there is a good potential that the dock and processing facility will be invited to move, as opposed to the museum.

### 4.2.12.3.1 Demography

Table 7 provides an overview of Hampton and Newport News demography.
**Population**

According to the U. S. Bureau of Census, the city of Hampton had a total population of 146,437 in 2000. Females made up 50.4% of the population, and males made up 49.6% of the population.

**Racial and Ethnic Composition**

For the city of Hampton, 97.6% of the population self identified as being one race. This city is racially diverse, with approximately half the population listing themselves as white (49.5%), and the most of the rest of the populations listing themselves as black (44.7%). Of those who were members of a single race, the next highest percentage was Asian at 1.8%. The remaining categories, American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, and some other race comprised 1.5% of the population. Two and four tenths percent of the population identified themselves as members of two or more races.

Hispanic people make up 2.8% of the population, with 1.0% derived from Puerto Rican and Other Hispanic or Latino groups, and 0.8% Mexican. Just over 96% of the population of Hampton were native born citizens of the United states, with 46.9% born in Virginia. Of 5,778 people who were foreign born, 28.5% entered between 1990 and 2000. The main location of origin for those foreign born people was Asia (37.3%), followed by Europe (27.2%) and Latin America (23.7%). The largest declared ancestries were other ancestries (48.4%), German (9%), English (7.8%), and United States or American (7.2%).

**Age Structure**

The largest cohort for Hampton is the cohort between 35 to 44 years of age (17.7%), with the next largest cohort between 25 to 34 years of age (14.8%). The median age for the people of the city of Hampton is 34 years. People under the age of 18 made up 24.2% of the population, and those people 65 years of age or older made up 10.3% of the population.

**Household Composition**

In 2000 there were 53,887 households in Hampton. Two thirds of these households were family households, and 16.4% were female headed households. Of the total households, one third were nonfamily households; 26.6% were householders living alone, and 7.9% were characterized by a householder 65 years of age or over. Households with children under 18 years of age comprised 36.8% of the total, and households with individuals 65 years of age or over made up 20.5% of the total households. The average household size was 2.49 people.
Figure 15. Aerial photo of Hampton's docks 8 m resolution from USGS Terraserver
Within Hampton’s boundaries, there were 57,311 housing units in 2000. Of these units, 94% were occupied, 6% were vacant, and 0.5% were used for seasonal, recreational or occasional use. The homeowner vacancy rate was 2%, while the rental vacancy rate was 5.6%. Owner occupied units made up 58.6% of the total while renter-occupied units made up 41.4% of the total housing units.

The median value for owner occupied units was $91,100, and the median monthly mortgage and other costs was $968. Renter occupied units had median gross rents of $603 per month.

Educational Trends

Of 92,477 people age 25 and older, 4.1% had less than a 9th grade level of attainment; 10.4% had a 9th to 12th grade level of attainment but no diploma; 85.5% had attained the status of high school graduate or higher; and 21.8% had attained the status of bachelor’s degree or higher.

Income

The per capita income for Hampton for 1999 was $19,774, while median household income was $39,532, and the median family income was $46,110. Fifteen hundred and eighty-eight people (11.3% of the population) were found to be below the poverty level with 9.5% 18 years of age or over.

Employment

Hampton had 115,091 people 16 years of age or over, with 62.4% of this age group in the labor force. Of those in the civilian labor force, 6.6% were unemployed. Military personnel made up 5.8% of the resident population of Hampton.

Employment Industries

For people residing in the city of Hampton, management, professional, and related occupations was the strongest occupational sector employing 32.1% of the employed civilian workforce, with sales and office occupations the next strongest sector employing 27.8% of the employed civilian workforce. Farming, fishing and forestry occupations employed 162 people, or 0.3%, and is, as for all counties or equivalents, is the smallest employment sector. By industrial classifications, the largest percentage of people are employed in educational, health, and social services (20.4%), followed by manufacturing (15.5%), and retail trade (13%).
Table 7. Demographic indicators for Newport News and Hampton, VA

<table>
<thead>
<tr>
<th>Population</th>
<th>Newport News</th>
<th>Hampton</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>180,150</td>
<td>146,437</td>
</tr>
<tr>
<td>% male</td>
<td>48.40</td>
<td>49.60</td>
</tr>
<tr>
<td>% female</td>
<td>51.60</td>
<td>50.40</td>
</tr>
<tr>
<td><strong>Racial and Ethnic Composition(%)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>one race</td>
<td>97.20</td>
<td>97.60</td>
</tr>
<tr>
<td>white</td>
<td>53.50</td>
<td>49.50</td>
</tr>
<tr>
<td>black/African American</td>
<td>39.10</td>
<td>44.70</td>
</tr>
<tr>
<td>American Indian and Alaska Native</td>
<td>0.40</td>
<td>0.40</td>
</tr>
<tr>
<td>Asian</td>
<td>2.30</td>
<td>1.80</td>
</tr>
<tr>
<td>Native Hawaiian and Other Pacific Islander</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>some other race</td>
<td>1.80</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Hispanic or Latino</strong></td>
<td>4.20</td>
<td>2.80</td>
</tr>
<tr>
<td><strong>Ancestry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Ancestries</td>
<td>46.7%</td>
<td>48.4%</td>
</tr>
<tr>
<td>German</td>
<td>9.6%</td>
<td>9.0%</td>
</tr>
<tr>
<td>English</td>
<td>8.3%</td>
<td>7.8%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>median age (years)</td>
<td>32.00</td>
<td>34.00</td>
</tr>
<tr>
<td>% under 18 years</td>
<td>27.50</td>
<td>24.20</td>
</tr>
<tr>
<td>% 65 year or over</td>
<td>10.10</td>
<td>10.30</td>
</tr>
<tr>
<td><strong>Household Composition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total households</td>
<td>69,686.00</td>
<td>53,887.00</td>
</tr>
<tr>
<td>% family household</td>
<td>66.50</td>
<td>66.60</td>
</tr>
<tr>
<td>% female headed households</td>
<td>17.90</td>
<td>16.40</td>
</tr>
<tr>
<td>% households with children under 18</td>
<td>393.00</td>
<td>36.80</td>
</tr>
<tr>
<td>% households with individuals over 65</td>
<td>19.00</td>
<td>20.50</td>
</tr>
<tr>
<td>average household size</td>
<td>2.50</td>
<td>2.49</td>
</tr>
<tr>
<td>Education (% of those over 25 years of age)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>2015</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>% less than 9th grade</td>
<td>4.20</td>
<td>4.10</td>
</tr>
<tr>
<td>% 9th to 12th grade, no diploma</td>
<td>11.30</td>
<td>10.40</td>
</tr>
<tr>
<td>% high school graduate or above</td>
<td>84.50</td>
<td>85.50</td>
</tr>
<tr>
<td>% bachelors degree or above</td>
<td>19.90</td>
<td>21.80</td>
</tr>
</tbody>
</table>

### Income

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>median household income</td>
<td>36,597.00</td>
<td>39,532.00</td>
</tr>
<tr>
<td>median family income</td>
<td>42,520.00</td>
<td>46,110.00</td>
</tr>
<tr>
<td>% below poverty level</td>
<td>13.80</td>
<td>11.30</td>
</tr>
<tr>
<td>% 18 years and over below poverty level</td>
<td>11.10</td>
<td>9.50</td>
</tr>
</tbody>
</table>

### Employment

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>population over 16</td>
<td>135,532.00</td>
<td>115,091.00</td>
</tr>
<tr>
<td>labor force (% population &gt;16)</td>
<td>92,586 / 68.3</td>
<td>71,790 / 62.4</td>
</tr>
<tr>
<td>unemployed civilian (% labor force)</td>
<td>5.60</td>
<td>6.60</td>
</tr>
<tr>
<td>Armed Forces (% population &gt;16)</td>
<td>7.20</td>
<td>5.80</td>
</tr>
</tbody>
</table>

### Employment Industries

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>management, professional and related</td>
<td>30.50</td>
<td>32.10</td>
</tr>
<tr>
<td>service occupations</td>
<td>17.60</td>
<td>15.10</td>
</tr>
<tr>
<td>sales and office occupations</td>
<td>27.60</td>
<td>27.80</td>
</tr>
<tr>
<td>farming, fishing and forestry</td>
<td>0.30</td>
<td>0.30</td>
</tr>
<tr>
<td>construction, extraction and maintenance occupations</td>
<td>10.40</td>
<td>11.00</td>
</tr>
<tr>
<td>production, transportation, and material moving occupations</td>
<td>13.60</td>
<td>13.70</td>
</tr>
</tbody>
</table>

### NAICS 1999 employment by location of establishments

<table>
<thead>
<tr>
<th></th>
<th>2016</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>agriculture, forestry fishing and hunting</td>
<td>37,639.00</td>
<td>None reported</td>
</tr>
<tr>
<td>mining</td>
<td>None reported</td>
<td>20-99</td>
</tr>
<tr>
<td>utilities</td>
<td>100-249</td>
<td>100-249</td>
</tr>
<tr>
<td>construction</td>
<td>3,927.00</td>
<td>2,410.00</td>
</tr>
<tr>
<td>manufacturing</td>
<td>24,845.00</td>
<td>5,497.00</td>
</tr>
<tr>
<td>services</td>
<td>55724-55803</td>
<td>39545-39564</td>
</tr>
</tbody>
</table>
For jobs located in Hampton, the 1999 County Business Patterns indicates that 48,646 employees worked in 2,467 establishments. The highest levels of employment were in retail (24.1%), health care and social assistance (12.5%), manufacturing (11.3%), and accommodation and food services (10.5%). Forestry, fishing, hunting, and agriculture support is not listed for 1999. For fishing related businesses including fish processing, shipbuilding and repair, the fish wholesale trade and retail fish markets, there were 8 establishments. The largest fishing related establishment was in wholesale; it employed between 50 and 99 people. The next largest fishing related establishment was a processor who employed between 20 and 49 people.

4.2.13 Newport News

4.2.13.1 Overview

As noted in the overview of the City of Hampton, the cities in the Hampton Roads area substantially coordinate on issues of transportation, planning, water and sewer facilities, and economic development. While the communities coordinate, they also maintain their own identities.

Newport News, in particular, is recognized as providing a significant number of jobs for the Hampton Roads area. The former Newport News Shipyard, now Northrup Grumman, was in 1980 the major employer for the entire Commonwealth of Virginia (Tazewell and Friddell 2000). In addition to the Shipyard, the city provides a number of industrial locations, including Jefferson Labs, the Seafood Industrial Park (also known as the small boat harbor), the Newport News-Williamsburg Airport, and locations near Fort Eustis. Along with industrial employment, retail sales are also strong in the community with several shopping centers, and what has recently been reputed to be one of the highest revenue malls in the country.

Newport News, like Hampton, joined in the annexation movement in the 1950s and engulfed Warwick City (formerly Warwick County) in 1958 (Tazewell and Friddell 2000). Newport News geographically is long and narrow and has a substantial waterfront area. At the southernmost portion of the city is the commercial waterfront, including the Small Boat Harbor, one terminal of the Port of Virginia, and the Shipyard area. Just north of this is downtown Newport News, and then progressively northbound, the development of the area becomes increasingly suburban. The northern area of the city is made up of a large park that provides a greenspace to separate Newport News from Williamsburg and York County.

Early history of Newport News is much like that of York County. The greatest portion of the area was composed of farms, with ancillary fishing. By 1830, the Newport New area was the second most productive area in production of pickled fish in Virginia, and oyster fishing was becoming sufficiently exploited that local people petitioned the Virginia Assembly to place regulations on who could have access to oyster grounds and create seasons for harvesting (Quarlstein 1996). In the post-Civil War era, the major
industrial development of the area began with the development of the railroad for shipping coal, which was followed by the institution of the Newport News Shipbuilding and Dry Dock Company by Collis P. Huntington. To this day, the shipyard is one of the largest employers in the area. Important to local fishing is the city’s involvement with the Newport News Seafood Industrial Park. It was begun in 1979 to provide employment for the low income area known as the southeast neighborhood. Currently, the area is fully rented and provides a space for scallop and crab companies, a ship repair facility, a state marine fisheries office, fuel suppliers, and a shrimp processing company.

4.2.13.2 Geography

General

A map of Newport News for location purposes is provided as Figure 13.

Metropolitan Statistical Area(s)

Newport News is part of the Norfolk-Virginia Beach-Newport News Metropolitan Statistical Area.

Distance to major cities

Newport News abuts the City of Hampton. The City of Norfolk is approximately 3 miles away by boat on the James, and Richmond is about 70 miles distant. Washington, D.C. is approximately 170 miles away.

4.2.13.3 Governance

Newport News has a mayor and council form of government with a city manager to handle day to day administrative and managerial duties.

4.2.13.4 Services

Newport News offers a substantial level of services to the community. The Newport News waterworks provides the water for Hampton, Newport News, northern York County, and part of James City County. In addition, the city handles the regular city services of emergency services, planning, streets, schools, tourism, courts, public housing, and an active economic development program.

In particular for fisheries, the city owns and maintains the Seafood Industrial Park, which is known locally as the small boat harbor. The facilities consist of 39 acres of land along the Newport News Canal, a former creek which was dredged and channelized. The port development administrator stated that the industrial park was originally set up in the late 1970s as part of a program to increase employment in the Southeast Neighborhood, a depressed area with a high percentage of African-Americans. The city leases the land, and now the bulkhead, and the leases are renewable.
4.2.13.5 Transportation

Air

Somewhat limited passenger air transportation is available through the Newport News-Williamsburg Airport. For increased service, Norfolk International Airport and the Richmond Airport offer more flights. Norfolk International Airport also offers cargo service.

Highways

Interstate 64, the major connector for Hampton Roads and Richmond and Interstate 95, runs through Newport News. In addition, the Interstate 664 spur which connects to the west also has a segment in Newport News.

Rail

Newport News has both passenger and freight service. Passenger service is provided by Amtrak with two stations in Newport News. Newport News is the eastern terminus of the CSX line.

Maritime

Newport News is one of two Hampton Roads communities that takes in substantial cargo through the Port of Virginia. Large vessels offload and load here, in an area just across Interstate 664 from the small boat harbor. Newport News is a major location for coal shipments headed from the United States across the Atlantic. Large container vessels come into the Port of Virginia as well, carrying all manner of materials.

4.2.14 Port

4.2.14.1 Description and Activities

Frey (1996) gives a very brief history of the Newport News Seafood Industrial Park. He notes that Newport News was seen as having commercial fishing on a smaller scale than in Hampton. The Seafood Industrial Park was started in 1979 with the development of a seawall and other improvements to the small boat harbor. Frey (1996) described the area as having spotty success at first. Drawn to the area were two fishing companies out of Texas, who came up to participate in scalloping, both of which left when “overfishing had cleared scallop beds all along the Atlantic coast.” According to Frey (1996), one of the companies was reputed for leaving “bills and rows.”

The Seafood Industrial Park is currently operating with an income provided to the city of $700,000 per year on mooring fees, leases, and taxes. The operating expenses are roughly $60,000 for the Industrial Park, plus two salaries, one full time harbor master, and
one part time secretary. The harbor master would like to add another pier, both to offer more services as there is currently a waiting list for 1,000 linear feet for moorings as well as to contribute $1,000,000 to the city's general fund (Ingram 2002).

The Newport News fishery port is concentrated in the Seafood Industrial Park. The location is adjacent to U. S. 664 and near to the Newport News section of the Port of Virginia major cargo shipping terminal (see Figure 14). In the Seafood Industrial Park there are scallop businesses, crab businesses, a shrimp processor, a shipyard, a fuel dock, and a Virginia Marine Resource Commission office. Now defunct are a harbor tour company and restaurant, but the company still pays rent, so the city has not assigned the area to other potential users. Although the Seafood Industrial Park focuses on fish and seafood, other commercial vessels such as tugs are allowed to tie up along the long pier that juts out into the James River.

4.2.14.2 Infrastructure

A fuel dock, a shipyard, and a VMRC office are situated alongside the docks and processors in the Newport News Seafood Industrial Park. The dock owners have ice, docking, and unloading facilities for vessels; the owners also provide processing services, in the forms of packing and shipping.

4.2.14.3 Port concerns

The major concern, which was expressed in a recent article in the Daily Press, is that there is not enough area to open up to businesses desiring space.

4.2.14.4 Demography

Population

The total population of the city of Newport News in 2000 was 180,150 people. Females slightly outnumbered males, representing 51.6 % and 48.4 % of the population respectively.

Racial and Ethnic Composition

Slightly over 97% of the population self identified as a single race; 53.5 % of the total population was white, 39.1 % was black, and 2.3 % was Asian. American Indian and Alaska Native people in addition to Native Hawaiian and other Pacific Islander and some other race made up 2.3 % of the population. People who identified themselves as being members of two or more races constituted 2.8 % of the total population.

Hispanic or Latino people made up 4.2 % of the population of Newport News, with 1.7 % Puerto Rican, 1.3 % other Hispanic or Latino, and 1.1 % Mexican. Slightly over 92% of the population of Newport News were native born citizens of the United
States with 48.1% born in Virginia. Foreign born people made up 4.8% of the Newport News population, and 35.4% of the foreign born population entered between 1990 and March 2000. For those people who were not born in the United States, 41.8% were born in Asia, 30% were born in Europe, and 21.3% were born in Latin America. For the total population, 97% identified ancestries; the largest category was other ancestries at 46.7%, followed by German (9.6%), English (8.3%), and United States or American (7.8%).

Age Structure

The largest cohort of people in Newport News was the group between 35 to 44 years of age, which represented 16.4% of the population. The next largest cohorts were the 25 to 34 years cohort (15.8%) and the 45 to 54 year cohort (11.5%). The median age of the Newport News population was 32 years. People under the age of 18 made up 27.5% of the population, and people 65 years of age and over made up 10.1% of the population.

Household Composition

In Newport News in 2000, there were 69,686 total households. Just under two thirds of the households were family households, and the remaining one third were non-family households. Of the total households, 17.9% were female headed households. Twenty-seven percent of households consisted of the householder living alone, and 8.1% of households consisted of a householder 65 years of age or older. Households with children under 18 years of age made up 39.3% of the total households, and households with people 65 years of age or over made up 19% of households. The average household size was 2.5 people.

There were 74,117 total housing units in Newport News in 2000. Ninety-four percent of the units were occupied while 6% were vacant. The area has 226 housing units used for seasonal, recreational or occasional use or 0.3% of the total units. The homeowner vacancy rate was 1.9%, and the rental vacancy rate was 6.2%. Owner occupied housing units comprised 52.4% of the occupied housing units; renter occupied units comprised 47.6% of occupied housing units.

The median value of owner occupied units was $96,400, and the median monthly owner costs for homes with mortgages was $998. Renter occupied units had a median rent of $559 per month.

Educational Trends

Of the 110,083 people 25 years of age or over, 4.2% had an educational attainment of less than 9th grade; 11.3% had between 9th and 12th grade levels of attainment but no diploma; 84.5% had high school diplomas or higher levels of educational attainment; and 19.9% had bachelor’s degrees or higher.
Income

Per capita income for Newport News was $17,843 in 1999. Median household income was $36,597, and median family income was $42,520. Thirteen point eight percent of the population had incomes below the poverty level, and 11.1% of the population 18 years of age and over was below the poverty level.

Employment

The population 16 years of age and over was 135,532 in 2000. Of this population, 68.3% was in the labor force, with 61.1% in the civilian labor force and 7.2% in the Armed Forces. For civilian labor force participants, 5.6% were unemployed.

Employment Industries

For people who reside in Newport News, the main occupations are management, professional and related occupations (30.5%), and sales and office occupations (27.6%). Farming, fishing and forestry occupations are the smallest occupational sector, employing 202 people (0.3%) of the employed civilian population 16 years of age and older. By industrial classification, the highest level of employment is in educational, health and social services (19.3%), followed by manufacturing (15.3%) and retail trade (12.8%).

For jobs located within Newport News, the 1999 County Business Patterns data from the U.S. Bureau of Census showed 3,717 establishments employing 84,667 people. The highest levels of employment for Newport News were in manufacturing (29.36%), retail trade (12.0%), and health care and social assistance (12.0%). Forestry, fishing, hunting, and agriculture support had between 0 and 19 employees, or provided less than 0.02% of the employment in Newport News. Fishing related businesses including fish processing, wholesale and retail trade in fish involved another nine establishments. While discrete numbers of employees were not listed for these establishments, one fish processor employed between 250 and 499 people, and one wholesaler employed between 20 and 49 people. Shipbuilding and repair is dominated by a single establishment that employs between 10,000 and 24,999 which builds vessels dominantly for the military.

4.2.15 Hampton Roads Fishing Community

The Hampton Roads fishing community is made up of fishermen, processors, boat owners, a small ship supply, a boat yard, and the Newport News Fishing Industrial Park. The processors activities range from packing and shipping to more advanced processing of products such as scallop medallions. In addition to scallops, products processed locally include shrimp, frozen fish, and blue crab. Bay fisheries include gillnet and pound netting which provide croaker, spot, and a number of other species. Compared to the other fish products, scallops have high volume and high value. In 2000 for Newport News and Hampton, scallops overcame blue crabs to become the most valuable species landed.
Figure 16. Aerial photo of the area of the Newport News small boat harbor/Seafood Industrial Park. Map from USGS Terraserver
According to the NMFS Vessel permit data, 60 vessels listing Hampton or Newport News as their principle port have permits for marine fisheries, and of those, 48 hold limited access scallop permits. Thirty six permits in the vessel category permit file have dredge permits; one permit is for a small dredge permit and 10 have net permits.

For Newport News, the city’s industrial park administrator said that a fair portion of the employees walk to work. This is consistent with the logic that induced the city to develop the property as it was done to provide jobs for the southeast neighborhood, a locality with a high population of persons with low incomes. Boat owners, like most of the residents of the general area, reside elsewhere in the metropolitan region. One family who runs and works as a scallop company has a member who lives in Hampton, while the rest of the family resides in Suffolk. Another vessel owner’s boats are in Newport News, but he lives in York County.

Boat owners and owners of processing facilities interviewed were white. Crews are mainly Mexican, but captains and mates are generally whites. Processing employees are a mix of whites, blacks, and Mexicans. One scallop company owner told me, “We used to mainly hire blacks, but now they’re being replaced by Mexicans.” He also noted that there is some seasonality in availability of crew as the Mexican people like to go home to Mexico between Thanksgiving and New Years.

One of the processors in Hampton provides gear for marine fisheries in addition to having boats and processing facilities. Another supplier is found in the downtown Hampton area, but it appears to mainly serve the estuarine fisheries. Also in Hampton, one processor has only recently begun taking scallops again. They had processed scallops in the past, but found they had problems in the days of meat count regulation, and therefore, refused to take scallops until the past year.
Chapter V

Community Concerns about Area Management and Buybacks

5.1 Framework and Factors to Consider

As discussed in Chapters II and III, the most cogent framework for assessing the potential for community-based, co-management for fishing communities is that used by Berkes et al. (2001) for small-scale fisheries, with some additions to account for factors that are implied by the definition of small-scale fishing communities. Those factors implied in the definition of small-scale fishing communities may or may not be present in large-scale fishing communities, and therefore, are factors that need to be evaluated.

To reiterate, the factors of Berkes et al. fall within three levels: (1) the supra-community level, (2) the community level, (3) and the individual level. There are two basic social factors at the supra-community level—the legal right to organize and external agents. In addition to those, one could also argue that environmental conditions and technological conditions are also supra-community level factors. At the community level there are thirteen factors that these authors consider relevant. The factors include (1) clearly defined boundaries, (2) clearly defined membership, (3) group cohesion (for example: high homogeneity of gear, kinship, religion, ethnicity, language), (4) participation by those affected or inclusivity, (5) cooperation and leadership at the community level, (6) leadership (by action, example, and direction), (7) empowerment (training and awareness of participants in taking on responsibilities), (8) property rights over the resource that are defined (although collectively held), (9) local organizations with defined membership, a right to exist, that are autonomous from the central government, and are representative of a majority of the resource users of the community, (10) sufficient finances, (11) partnerships and a sense of being a full partner, (12) accountability and transparency in decision-making, and (13) a strong co-management institution for making decisions as well as for managing conflict. At the individual level, there were two factors, an appropriate incentive to encourage individual participation and credible rules with equitable and effective enforcement.

Two other factors may also be important for determining the feasibility of community-based, co-management. These two factors are isolation of the fishing community, and dependency of the community upon fishing. A third consideration is “the need to do something.”

The framework for analysis of these factors is described by Pido et al. (1997) and is shown in Figure 4 of Chapter II. This depicts the community, individual, and supra-community factors as well as the patterns of interactions and incentives leading toward outcomes, which then feed back into new factors.
This chapter reviews the various factors for the ports examined in this study, and presents a qualitative analysis of the potential for community-based/co-management for the sea scallop fishery based upon those factors. Special emphasis is given to determining community concerns about the use of area management and buyback programs.

5.2 Supra-community Factors

As noted above, there are two social factors to consider under supra-community factors. These are the legal right to organize and external agents. While the legal right to organize affects all the communities, external agents are somewhat variable by location. External agents are, therefore, individually addressed for New Bedford and Cape May. The role of external agents is discussed jointly for Seaford and Hampton Roads.

5.2.1 Legal Right to Organize

In the United States, legal rights to fishing tend to occur in two settings, that of community development quotas and individual fishing quotas, most often as ITQs. Only a limited number of communities are designated to have the right to regulate EEZ fisheries through community development quotas (CDQs). Those communities which are allocated CDQs are typically highly resource dependent communities in Alaska, and the quota is allocated for the specific purpose of community development. None of the communities studied falls within the class of CDQ communities. In another instance, the Cook Inlet Beluga Whale fishery, a native community was granted the right to determine some aspects of the take of whales; the quota, however, was established by the North Pacific Fishery Management Council. The Pacific salmon fishery offers another example of community-based, co-management in the United States. For these communities, treaties were used to predicate the judicial decision requiring inclusion of the communities (Pinkerton 1989, Ebbin 2001). None of the communities studied have treaties or other pre-existing requirements for the government to be required to join in community-based, co-management. Finally, ITQs are another mechanism to allocate decision-making. In this case, the allocation is made to individuals (particularly boat owners); ITQs have, however, been limited in application, and at present, have not been applied to the sea scallop fishery.

Voluntary organizations may be allowed to manage a quota in some U.S. fisheries, under certain circumstances. There are three major voluntary organizations concerned about the management of the sea scallop fishery; they are the Fisheries Survival Fund, the Scallop Group, and Garden State Seafood. To date, none of these groups have been allocated rights or responsibility for decision-making.

Under the criteria of Berkes et al. (2001), none of the organizations addressing the scallop fishery have the legal right to organize the fishery as they have no enabling legislation on which to form legal requirements for authority and responsibility for the resource. The cities or towns also have not been granted the responsibility for management of the sea scallop fishery. This lack of legal recognition is a major barrier to
overcome if community-based co-management is to occur in the scallop fishery.

5.2.2 External Agents

External agents for the fishing communities include the educational institutions that study the communities, work with fishermen to provide fishery and economic data, and advise on socioeconomic issues, as well as non-governmental organizations (NGOs) that address fisheries issues.

5.2.2.1 New Bedford

New Bedford, due to proximity and to interests expressed in interviews, is most closely associated with the University of Massachusetts at Dartmouth. The University of Massachusetts houses The School of Marine Science and Technology (SMAST), which is located in New Bedford. The School of Marine Science and Technology provides scientific information, and is in the process of developing programs to address socioeconomic issues in New Bedford fisheries. In addition to the more local institutions, MIT through its Sea Grant offices has a long-term connection with the community through various social impact studies done over the years, and through its efforts with the Massachusetts Fishermen's Partnership. The Massachusetts Fishermen’s Partnership has begun facilitating some first steps toward community-based, co-management by facilitating community determination of preferences for the use of emergency groundfish funds. While the aforementioned institutions are in Massachusetts, a more distant institution has participated in cooperative studies on stocks and gear selectivity on Georges Bank with the fishermen of New Bedford. Students and faculty of the Virginia Institute of Marine Science, College of William and Mary, School of Marine Science have collected data while on New Bedford scallop vessels that were actively fishing and/or participating in science projects.

In addition to the educational institutions, New Bedford is also a focus for several NGOs. Within the fishing community, several NGOs have been established including, but not limited to, Fisheries Survival Fund, Trawlers Survival Fund, Shore Support, and the Scallop Group. These NGOs promote retention of fishing as an activity that is undertaken from New Bedford and other ports along the eastern seaboard. Contrasting with the mission of the fishery interest NGOs, environmental NGOs, including the Conservation Law Foundation, Oceana, and the National Audubon Society, have some influence on fishery management through participation in management meetings and through litigation of fishery management decisions that affect New Bedford and other fishing communities. In addition, these organizations have fairly regular press in the New Bedford newspaper's editorial pages pressing for greater restrictions on fishing activities. Overall, the environmental NGOs promote restriction on fishing both for stock regrowth and for lessened habitat destruction; they may be inhibitory in developing community based/co-management in that they may divide the community based upon their contentions.

5.2.2.2 Cape May
Cape May is associated with Rutgers, the State University of New Jersey, through researchers in fisheries, oceanography and social sciences as well as through Sea Grant and county extension. Researchers in fisheries have undertaken cooperative research with fishery participants, for example testing real time reporting of squid catch. Other research is on-going to generate baseline community descriptions of the fishing community as a part of efforts to describe the communities of the Mid-Atlantic. In addition to studies by Rutgers, the Virginia Institute of Marine Science has also participated in some cooperative research with fishermen from Cape May, both with the scallop and the squid fisheries.

NGOs in the Cape May area that are concerned about offshore fisheries include the Garden State Seafood Association and the Cape May Seafood Association. Both organizations exist to promote the seafood industry. In addition to the NGOs with industry interest, the National Audubon Society has been interested in local fisheries. In particular, the National Audubon Society has successfully halted the taking of live horseshoe crabs, which were harvested to be used as bait in the conch fishery. While the National Audubon Society has participated in litigation to attempt to stop some forms of fishing, the local Audubon office at the Nature Center of Cape May had no particular comment with regard to offshore fishing.

5.2.2.3 Seaford and Hampton Roads

Seaford and Hampton Roads are geographically close to the Virginia Institute of Marine Science, College of William and Mary, School of Marine Science (VIMS), and participate in activities with faculty and students of the institution. The fishermen of these communities have undertaken cooperative projects in economics and fishery biology with VIMS representatives. In addition to VIMS, there is an extension office of the University of Virginia that is located in Hampton to work with fishermen in the area. Studies of social factors for the area have largely been undertaken by Rutgers, the State University of New Jersey.

Few NGOs with interests in offshore fisheries, particularly the scallop fishery, are found in this area. Overall, interest in the area tends to focus on the Chesapeake Bay and on oysters, which are not part of the current study. In the past, there were several fishing industry associations concerned with sea scallops, but after Amendment 4 to the sea scallop FMP was implemented, they ceased to continue operations.

5.3 Community-level Factors

As noted in the introduction to this chapter, there are thirteen community level factors under the Berkes _et. al._ (2001) framework. Three additional potential factors include isolation, dependency, and a perceived “need to do something.”

5.3.1 Clearly Defined Boundaries

To determine if boundaries of areas fished are clearly defined, information was
obtained from interviews, triangulated, and then, mapped relative to monthly fishing activities reported by three digit areas fished by port of landing (NMFS data). For all the communities, there were regular areas fished. Vessels landing in New Bedford, particularly prior to area closures, focused upon the north side of the Hudson Canyon in the spring and upon Georges Bank the remainder of the year. Vessels landing in Cape May tended to focus upon the area north of the Delaware Bay and off of Long Island, with some occasional harvesting on Georges Bank. Vessels landing in Seaford and Hampton Roads tended to have a broader area harvested, but tended to stay in the area between Cape May and Long Island. Discussions with members of the fishing community, however, indicated there is a tendency for vessels to occasionally fish more distant areas.

While the boundaries are fairly clear, they are not exclusive, and therefore, may not be a good measure for determining community-based co-management strategies, or how to allocate an area of ocean to a particular community. Furthermore, discussions with fishermen revealed that there is a strong preference by fishermen to be restricted to areas by regulatory decisions.

5.3.2 Clearly Defined Membership

The sea scallop fishery is a limited access fishery, which means only permitted vessels are allowed to fish. Permits are issued to the boat owner for this fishery. The permitted vessel owners may hire additional members, but while there may be some shifting of employees, typically the owners or captains know the remaining participants. While not all members may reside in the port communities, they reside mainly in nearby communities, and they are typically known to the vessel owners who do reside in the port community.

5.3.3 Group Cohesion

As discussed in Chapter 3, there are several indicators of group cohesion. The first is the presence of a fisherman’s hangout. The next indicator is the discussion of factions within the fishery from participant-observation and interviews. Another indicator is the presence of articles in local newspapers, and publications that have a positive discussion of the fishing industry. The final indicator is the presence of services and/or infrastructure that benefits the fishing industry.

Not all of the communities had a fisherman’s hang-out. New Bedford has one very well recognized fisherman’s hangout in the north terminal area that has an active customer base, and was used for a location recommended by several informants to meet for interviews. The scalloper’s bar in Fairhaven is somewhat less in activity, but still serves as a location for lunch for scallopers on the east side of harbor. Finally, one other location on the south side of New Bedford also has a fair proportion of fishermen among its customers. Cape May has a couple of restaurants that serve recreational fishermen, but the commercial fishermen get together on the docks as much as anywhere. Seaford and Hampton Roads do not have a location that serves as a fisherman’s hangout.
Interviews and participant-observation indicated one major set of factions within the scallop fishery—the distinction between the fleet owners and the owner-operators, who fall more in line with hired captains and crews. Although all participants in the fishery want to see the fishery continue, they tend to support different forms of management and regulatory strategies. The fleet owners, in particular, are much more interested in a different management strategy. When management options were discussed with fleet owners, they tended to bring up consolidation or ITQs as a management strategy, and the need for increased efficiency. Owner-operators and other participants were much more likely to discuss the need for a healthy stock, and maintaining an appropriate number of days at sea to keep business going. New Bedford has more participants with interests falling with owner operators, hired captains, and crews compared to the number of fleet owners, and thus, the fishing community has some elements of being less cohesive than the other three communities that have a more dominant number of fleet owners.

In contrast to the distinction between groups described in the last paragraph, New Bedford fishermen will plead the case for service providers to the fishery at meetings. For example, the requirement for 10 inch mesh twine tops caused problems for gear providers in New Bedford because there is the need for a one-year lead time to manufacture the materials in Portugal. Also, insurance is extended to fishing dependent businesses, not just to fishermen through the Fisherman’s Partnership. The fishery participants will remind other businesses that they do have that advantage and recommend that they sign up.

Similar recognition of interdependence between fishermen and gear and service providers does not occur in Cape May. The shipyard people complained of problems in getting paid especially by people who “drive expensive cars but don’t seem willing to pay for having their vessels repaired.” In Hampton Roads and Seaford, some of the vessel owners are also gear providers so there is no distinction between the industries.

Newspapers and other publications reviewed had at least some positive discussion of fishing in New Bedford and Hampton Roads. While there are articles that may not be fully supportive of fisheries in the New Bedford paper (The Standard-Times), the paper does appear to support the retention of fishing in New Bedford and Fairhaven. The paper does support some restriction on fishing to improve environmental quality, but not to the extent that the fisheries are entirely shut down. Tourist and other promotional materials for New Bedford also discuss the identity of the city as a “fishing community.” An example of this is the promotion of New Bedford as a city “that looks to the sea” and the banners of the newspaper that has photos of fishing vessels. Neither the Cape May nor the Hampton Roads newspapers have fishing issues discussed with any frequency. The Cape May paper tends only to have information when fisheries are closed, and there is little discussion of commercial fishing in tourist publications other than the listing of the tour of the docks at Schellenger’s Landing. The Hampton Roads and Seaford area newspaper seldom provide any discussion of marine fishing issues. If fisheries articles exist, they are mainly the “fishing report” or focus on blue crab or oysters. Recently, however, two articles were published in the business section that discussed the Newport News Fishing
Industrial Park, and the work of one scallop company found there. These articles were positive and focused on the improved scallop fishery and the economic benefits thereof.

As noted in the description of the fishing communities, not all the communities provide services or infrastructure that benefits the fishing industry. New Bedford offers substantial services for the fishing industry. In addition to the Hurricane Barrier and the JFK Highway (Route 18), New Bedford provides social services for fishermen through the state sponsored Fishing Families Assistance Center and through provision of a central office for Shore Support, economic assistance (gap funding for fishing businesses) through the economic development department, provision of land cleaned from its former contaminated condition through coordinating brownfield redevelopment, and preservation of port uses through the port development plan. In Cape May, low interest loans through the county of Cape May and a smaller loan program available from Lower Township are available to support commercial fisheries development. Newport News owns the Seafood Industrial Park, and preserves the property as a port, maintains the channel, and provides additional docking facilities; neither Seaford nor Hampton provide infrastructure or financial assistance for the fishing industries.

From all the described indicators, New Bedford is probably the most cohesive community, with Newport News and Cape May falling somewhere in the moderate range for these communities, and Seaford and Hampton the least cohesive.

5.3.4 Participation of Those Affected (Inclusivity)

At the present time, few of those affected by fishery management and regulation participate in the process. In part, these participants are limited by the time it takes to get to the meetings, by a lack of a sense that their perceptions and ideas are appreciated, and by the length of the process. Those fishing industry participants who do attend meetings and participate as advisory committee members tend to be fleet owners and/or captains of limited access vessels. Crew members and hired captains tend not to participate in meetings, and often they are uniformed as to the planned regulation. In discussions with lumpers, fishermen, and dock foremen at Cape May, one of the informants said “They (the fleet owners) only tell us what they want us to know.” An owner operator also in Cape May said that he supports FSF “because they know more than I do (about management and coping with the New England Fishery Management Council).” While only part of the limited access vessel fishermen participate in management, an even smaller proportion of general category access holders participate. On one occasion, two general category scallopers did come to a NEFMC meeting when discussion of limiting the number of general category vessels was scheduled.

The industry organizations, such as FSF and Garden State Seafood Association, tend to have few meetings. In general, the organizations exist to spread the costs of employment of consultants who participate at the meetings. FSF does have a core group of “five guys” and its director who meet with the consultants to direct efforts, but meetings of all contributors have not been held. This appears to be done to streamline meetings,
and to get to some type of solutions in a short period of time.

Few municipalities participate in the management process or in litigation. At present only Portland, Maine and Gloucester and New Bedford, Massachusetts have participated in either management meetings or litigation of fisheries regulation. Portland, Maine has a staff member who attends meetings and discusses the community concerns including the need for the community to provide services for those who might be displaced, the ethnic groups who could be affected by changes in management, and the effects on the city with changes in the port. New Bedford and Gloucester have participated as intervener in the groundfish case recently and could also participate in future actions regarding fishery decisions.

New Bedford has the most active community of the four in participating in local meetings. In the city, two community forums have been held recently to acquaint the city with the needs and concerns of the fishing industry. At these meetings, the local newspaper facilitated, and community leaders including city councilmen and the local senator’s office staff attended and took ideas and comments from industry participants and their family members. At another meeting, sponsored to gain data with regard to the effects of the groundfish closure, there was a substantial discussion of current activities in the area by fishing organizations. While there have been a number of initiatives undertaken such as the studies to reopen Georges Bank to scalloping, there was a realization that there has been little interaction with the municipality and some discussion ensued as to what to do next, and at least one participant suggested improving connections between the industry and the city. Subsequent to this meeting, three local organizations coordinated a fisherman’s rally; city councilmen participated in the rally speaking in favor of the fishing industry and calling for greater assistance for fishermen and their families.

While the other communities may offer some level of service to fishermen, little activity toward participating in the promotion of fishing activity occurs. Cape May county offers a low interest loan for the fishing industry to enhance or maintain employment. Beyond the loan program offered by Cape May County, only Newport News offers substantial other service for the fishing industry in provision of the industrial park and maintenance of the channel, but it is such a small part of the city’s economic activity that there is minimal additional effort to support the industry. As an example of efforts that could occur, the regional planning district has hired assistance to influence military base closure commissions to avoid those of Hampton Roads. While similar activities could occur for fisheries, they are not considered important enough to undertake.

5.3.5 Cooperation and Leadership at the Community Level

As discussed in Chapter III, two indicators for cooperation and leadership at the community level are the presence of a fisherman’s monument and the presence of fisherman’s organizations. The fisherman’s monument is an indicator of community or industry cooperation in provision of both the monument and its placement at some point in time. An Organization for fishermen indicates ongoing interaction and leadership in the
New Bedford and Cape May have fishermen’s monuments. The New Bedford monument is in the Bethel with the cenotaphs listing the names of those lost at sea. In addition, Thonnessen Park has a statue of a “sea god” with marine life that is a captioned “...those seamen who's only grave is the ocean floor.” The park is named after a prominent local resident who in the 1920s established a ship supply business that is still a part of the local economy. In addition to Thonnessen Park, there is Prince Henry the Navigator Park, which features a large statue of Prince Henry the Navigator at Pope’s Island. This park celebrates the Portuguese maritime heritage and the connection between Portugal and New Bedford. Cape May has a monument overlooking the harbor located in the City of Cape May. It consists of a statue of a woman with two children, a wall incised with the names of fishermen lost at sea, and flag poles with the American and state flags. One former fisherman explained that the monument serves as a location for fishermen to go to reminisce, and that almost any evening a fisherman or former fisherman will be found at the monument. The monument was created and funded by a group of fishermen, and until quite recently, was also maintained by the same group. Neither Seaford or Hampton have a fisherman’s monument.

There are fishing industry organizations in both New Bedford and Cape May, but they no longer exist in Seaford and Hampton Roads. The most active fishing organization for the sea scallop fishery is Fishery Survival Fund, located in the New Bedford area, specifically in Fairhaven. Fishermen up and down the coast contribute to Fisheries Survival Fund to provide representation at fishery management meetings by legal and scientific council. Other organizations also exist in New Bedford, particularly Shore Support and the Scallop Group. Shore Support aids in family adjustment to the particular lifestyle of fishing families, and advocates for improved health, safety and family situations. The Scallop Group tends to be a group of fleet owners and may be more supportive of ITQs and/or consolidation. The Cape May Seafood Association exists to promote recognition of the fishing industry and has also attempted to gain insurance for medical care for fishermen.

5.3.6 Leadership

Within the fishery community, Fisheries Survival Fund is viewed as the main leadership organization. The organization has had success in convincing the New England Fishery Management Council to reopen at least part of the areas that were closed for groundfish rebuilding. Contributers to FSF are found from at least Massachusetts to Virginia. Although the fishing community sees FSF as their representatives, the cities do not yet participate in the fishery management process, nor are any city agencies seen as representing the fishermen.

In addition to FSF, a few individuals from New Bedford, Fairhaven, and Cape May regularly attend NEFMC meetings, but only FSF is seen as representing the fishermen in general. In discussing management with owner operators in Cape May, two
owners expressed that they were not keeping up on management individually, but that they would support FSF's positions. The comment was "(FSF) knows more about the current management proposals than I do, so I'll go along with them."

5.3.7 Empowerment

Empowerment is the development of increased knowledge and improved political and social skills developed through longer term interactions. Empowerment indicators include participation in research, a positive view that users' and communities' voices are heard at Council meetings, and through participation in legal actions related to fishery management.

Fishermen in all communities have participated in research to determine the level of stock rebound in the various closed areas. Particularly for the Georges Bank closure areas, Fisheries Survival Fund participated to gain reopening. While not the only participants, the organization is seen as one of the more empowered groups within the fishery.

While fishermen have participated in the management process, FSF and numerous other members of the fishing communities have expressed that their voices are not heard at the Council meetings. In so many words, one of the New Bedford fishery participants said "I don't need to go to Danvers to be disrespected, I can get that at home." In addition, the director of FSF stated that they had provided Amendment 10, and that the Council had not gotten back to them. With regard to area management, all the informants expressed concern that their ideas were not being given full consideration, and that the plan would lead to micro-management.

None of the port cities studied participate in the management process. Only Portland, Maine has had city staff attending and commenting at meetings attended to support this study. New Bedford lists one of the Council members as the city representative, but that member is not on city staff nor does he have an appointed position to speak for New Bedford as such.

While New Bedford does not participate in the management process, it has joined into litigation as intervener in the groundfish case (Conservation Law Foundation v. Donald Evans). The city expressed its interest in maintaining fishery jobs and in maintaining the number of days at sea to keep more vessels in business.

5.3.8 Property Rights

Property rights over the resource are determined from the regulatory scheme. The scallop fishery has a limited access component and a general category component. While directly stated rights to the resource are not defined, access to the resource is allocated by the days at sea and/or the 400 pound per day limit of the general category permit. While these rights of access are given to the permit holders (boat owners), no rights over the
resource are given to either the fishing industry groups or the port communities.

5.3.9 Appropriate Local Organizations

Appropriate local organizations are characterized by the presence of local organizations that meet the qualifications of clearly defined membership, legal right to exist, autonomy from NMFS and NEFMC, and representation of a large proportion of fishermen in the community. The organization that best meets these criteria is FSF, which represents the fishermen, but does not necessarily represent the cities or towns (port communities). In addition to FSF, Garden State Seafood Association also represents the New Jersey fishing industry. None of the cities or towns in the study have local organizations or staff that represents the municipalities’ interest in fishing. While the industry may be represented, this lack of municipality organization makes it difficult to undertake community-based co-management unless the community is defined as being the industry community of interest.

5.3.10 Adequate Financial Resources

Adequate financial resources are those needed to undertake efforts to support community-based co-management including being able to fund studies needed for resource capacity, monitoring, and enforcement and the process for decision-making. For the organization that most closely meets the requirements of appropriate local organizations, FSF, this is the case. At present they collect funds from contributors who donate funds based on the catch from each trip. Not all participants contribute, but most of the scallop fishing vessels do to jointly fund legal, scientific and political representation at fishery management meetings. In addition to funding representation, FSF also has coordinated scientific study with vessels provided by contributors.

5.3.11 Partnership and Involvement in Management

As noted before, there is a perception by members of the fishing community that their point of view is often ignored in the management process. While FSF has had some successful participation in the management process with the reopening of at least portions of Georges Bank, the director has suggested that with regard to area management, the organization’s efforts have been discarded. She has intimated that she expected that the proposed Amendment 10 submitted by the organization has languished without any action being taken.

5.3.12 Accountability and Transparency

Within FSF, the outcome is seen as being sufficiently accountable. However, transparency, or inclusion of the contributors, in meetings is not a major concern. The organization has five reviewers plus the director and the three hired counselors (one lawyer, one scientist, and one person who is seen as “being politically correct”) who meet and consult on issues. At present, this has sufficed and will for a time period. If
contributors decide that they are not being represented properly they will stop contributing funding.

As none of the municipalities are participating in the fishery management process, they currently are neither accountable nor requiring transparency. An example of one of the municipalities participating in the provision of fishery industry service and having a good measure of accountability and transparency is the port planning process used by New Bedford and Fairhaven in developing a new port plan. The plan is the result of numerous meetings of the port commission and the approval process of the city of New Bedford. While there may still be some differences of opinion on certain aspects, including revision of the Rt. 6/Rt.18 intersection, overall the plan is well accepted. If a similar process with other fishery services and/or issues could be developed, this would meet the requirements of accountability and transparency.

5.3.13 Strong Co-management Organizations

As noted earlier, there are no organizations to whom any rights have been given allocated, and no co-management agreements have been drawn up. However, despite the current lack of co-management strategies, if the New England Fishery Management Council could agree to begin working with either the municipalities or the industry more directly, designation of a quasi-judicial organization to oversee dispute resolution would be useful. At present, the legal system is serving to adjudicate between various interest groups, yielding a system by which nearly all decisions are being questioned by one organization or another that perceives it has not had a “fair shake” in the current management process. Environmental organizations are recognized for using this tactic, but the municipalities have also been participating as intervenors.

5.3.14 Isolation

Isolation for east coast fishing communities is, at best, relative. None of the port community municipalities is more than two hours from a major city, and all have access to major highways within county.

Highway connections are either in or proximate to all of the municipalities, or in the case of Seaford, York County. While the highways provide connection to other communities, Cape May (Lower Township) is the terminus of the Garden State Parkway, so it has basically only one-way access, and that to the north. To cross Delaware Bay, there is a ferry, but it is somewhat expensive, and it prohibits as complete an interchange of traffic as the ferry has a limited number of runs, especially during the winter. In consideration of it’s position as a terminus of major highways, Cape May is the most isolated community of the four studied.

All the municipalities are part of a metropolitan area. Metropolitan areas are defined as a central city with its surrounding area in which there is substantial economic and social interactions. New Bedford serves as the central city of the more localized
MSAs in New England. Cape May is part of the Atlantic City-Cape May MSA, and the remaining communities are part of the Norfolk-Virginia Beach-Newport News MSA.

5.3.15 Dependency

Two aspects of dependency are considered for the fishing communities, economic dependence and social dependence. Economic dependence is characterized by a low diversity of employment or earnings and a level of employment or earnings share above that of the state. Social dependence is identified by social interactions focusing upon the fishery. In this study, the Shannon-Weaver (1949) index, which is used by the U.S. Bureau of Census and numerous other government agencies to assess dependency, is used to develop measures of economic diversification.

The Shannon-Weaver index is relatively straightforward to calculate, and unlike many other diversification indices offers a way to determine the relative diversification of economy without having to using a more aggregate reference level (e.g., the state or the U.S. economy). The formula for the index is as follows:

\[
SW = \sum_{i=1}^{N} \frac{E_i \ln E_i}{D_{MAX}}
\]

where \( E \) is ratio of employment in a given industry relative to total employment for the region, county, or state being analyzed; \( \ln \) is the natural logarithm; \( D_{MAX} \) is the value of the numerator if all \( E_i \) were equal. Ratios based on other economic measures may also be constructed (e.g., income, earnings, and wages and salaries). In this study, the index is constructed for the one digit SIC codes, and analysis is restricted to 11 industries. If an economy only had one industry, the value of the index would be 0.0, and if all industries had equal employment, the value of diversification would equal 1.0. The Shannon-Weaver index, although relatively simple, is widely used; alternative derivations are presented in Gollop and Monahan (1991).

Location quotients are also calculated for the one digit SIC industries. A location quotient is a relative measure of the importance or level of dependency of a community or county on an industry relative to a higher geographic aggregation (e.g., the state or the U.S.). A location quotient can be less than one in value, equal to one, and be greater than one. If the quotient is less than one, it is assumed that the industry is not meeting local demand for a good or service; if it equals one, it is assumed that local employment is sufficient to exactly meet the local demand for a good or service; and if the location quotient exceeds one in value, it is assumed that local employment is basic, and that local employment must produce and export goods to non-local areas. The formula for the location quotient is as follows:
where $X_i$ is the local level of employment in the $i$th industry at time $t$; $X$ is total local level of employment in all industries at time $t$; $Y_i$ is the state or higher level of employment in the $i$th industry at time $t$; and $Y$ is the total state or higher level of employment in all industries at time $t$.

5.3.15.1 Economic Diversification and Dependency

Economic dependency indices were calculated for the counties due to the availability of time series data predating the closure of Georges Bank. The data for these indices came from the Bureau of Economic Analysis REIS database (http://www.bea.gov/bea/regional/reis/). The Shannon-Weaver indexes and the location quotient values were calculated for all years between 1990 and 2000 (Tables 8-9).

The level of diversification varies by county or area. Bristol, Massachusetts exhibited the highest overall level of diversification. Cape May, New Jersey had the lowest level of diversification. Hampton was next to the lowest, and York County and Newport News were nearly identical. All areas, except Bristol and York-Poquoson, exhibited an increase in the level of diversification between 1990 and 2000; New Bedford remained relatively constant.

Relative to employment patterns in the various areas, York County and Poquoson had the highest location quotient in agricultural services, forestry, fishing, and other activities; thus, indicating that employment in this sector produced goods exported out of the immediate area. Bristol had the second highest location quotient in agricultural services, forestry, fishing, and other activities. This is not surprising given that the county does have a significant fisheries sector. Cape May exhibited the least amount of employment dependency on agricultural services, forestry, fishing, and other activities. Cape May and Hampton, which are not very diversified, had high dependencies on, respectively, retail trade and government for employment. If area management or buyback had serious negative consequences, both Bristol and York Counties could be substantially affected.
Table 8. Shannon-Weaver Index of Diversification

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Table 9. Location Quotients for Study Communities, 1990-2000

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Table 9. Continued

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| New Bedford’s Summerfest began as a scallop festival. While scallops are still a focus of the food at the festival, the festival itself has developed into a more general celebration of the community of New Bedford. Summerfest is still held on the waterfront, and although it has a broader focus than in the past, it is still something of a fishing festival.

The Whaling Museum in New Bedford has an exhibit on fishing, and fishing as an activity linking New Bedford’s present to its historic whaling past is presented in exhibits (and the introductory film) of the Whaling National Historic Park. More extensive exhibits are to be expected if funding is found for the
proposed Oceanarium. The proposed emphasis for the Oceanarium that has been presented is the sea and New Bedford fisheries.

There are multiple buildings with either murals or decorative elements of fishing in New Bedford and Fairhaven. One home in Fairhaven has the bow of a ship as its porch roof. The gear supplier on Fisherman’s Island has a mural of fishing vessels. New Bedford City Hall has ships and other maritime elements in bas relief in the sandstone face above the doors.

5.3.15.2.2 Cape May

There has in the past been a fishing festival that occurred in August at Schellenger’s Landing. The festival no longer occurs. The single nod to a fishing festival is serving of clams at a historic festival by the Cape May County Historical Society.

No museum exhibits of fishing were found in the area. Public architecture and depiction of fishing does occur at some locations in the greater Cape May area through mail boxes with a fishing theme and decorations of fish and gear placed on homes and commercial buildings. Possibly the most observable are the small murals associated with the whale watching businesses, which are near the bridge to the entrance of Cape May from the Garden State Parkway.

5.3.15.2.3 York County and Seaford

One festival occurs in York County at the Waterman’s Museum. The focus is more on boat races, vessels, sale of water-oriented and fishing oriented decorative arts, and seafood. The festival has occurred for the last few years, and attendance depends upon weather conditions as much as any factor observed.

The Waterman’s Museum has exhibits on vessels, fishing techniques, and gear used within the Chesapeake Bay and offshore. This museum had the only exhibit on the scallop fishery found in the study communities.

There are some depictions of fishing on homes and particularly on fishing related businesses in the area (especially recreational fishing gear providers). In addition, other maritime related decorations in the area are miniature lighthouses, which are often observed as lawn ornaments in the area. The public buildings in the area are somewhat depauperate in decorative elements, and thus, no depiction of fishing occurs on them. This may be due in some part to the location of the county offices in an area proximate to the National Park Service properties associated with Yorktown and the requirements of architecture commensurate with the historic nature of the property.

5.3.15.2.4 Hampton Roads

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In Hampton Roads, the majority of the festivals are held in the City of Hampton. Bay Days is the major festival with a fishing or marine theme, but more recently it has had as its focus preservation of the Chesapeake Bay ecosystems. Fresh fish is served at the food booths and exhibits of marine life are displayed.

The Mariner's Museum in Newport News has the strongest maritime focus, but tends to focus upon vessels, not as much upon activities on the Chesapeake or at sea. Some exhibits have a secondary focus on fishing, for example as a dominant theme of a specific photographer. Otherwise the exhibits may include a fishing type of vessel, but its use and the importance of fishing is not a major theme.

Like York County, some decorative elements in the area may include lighthouses, fishing themed mailboxes or other decorative elements of residences. One example of fishing-oriented decoration of a commercial building is the neon sign of the downtown Hampton fish house, which is something of a local icon, with photographs of it appearing in local publications. Public architecture and decorative elements depicting fishing are sparse. Hampton has a statue in front of city hall entitled “From the Sea to the Stars” with a man holding a fishing net in one hand, and reaching upward with the other. This statue can be interpreted to showing that Hampton has left its maritime history in quest of the stars, or that both are still important. In local context of planning and publications, the first seems to be the more correct interpretation. No public buildings in Newport News were observed to have fishing themed decorative elements.

5.3.16 Area Management, Buybacks, and Problems

A major objective of this study was to develop options to permit industry to avoid or mitigate the potential negative consequences of extensive closures that were feared to be developed as a part of area management, whether for scallops or for protection of habitat for other species. The previous designation of large sections of Georges Bank as closed was distressing to New Bedford in particular. Over time, however, there has been a recognition that participation in reopening and resilience in the system due to the corporate to quasi-corporate structure of the industry is ameliorating several of those concerns.

Members of the fishing community expressed several concerns with regard to area management. Some seemed to be more concerned about direct effects and some were concerned about secondary effects. Among the direct effects that were attributed by New Bedford residents to *ad hoc* area management were the potential to cut funds for city services, a decline in the crew share under the lay system, difficulty in having appropriate gear on hand in a timely fashion, and, for some, the perception that with removal of decisions from boat owners that locally increased micro-management thereby pulling authority away from captains and crews. Other direct effects have included a decline in the value of scallops, overcrowding of the
harbor, and congestion of the areas during re-opening and of the remaining open areas. Secondary effects related to declining health and working conditions from the superabundance of scallops.

The fishing community is aware of its fiscal contribution to New Bedford and Fairhaven through the taxes paid. One supplier stated “with the economic slowdown and the layoffs of city staff and school employees, I hate to think what things would be if all the fishing was down.” Scallopers are making the major contribution at present because the groundfish days-at-sea have been cut substantially and because of the closures on Georges Bank.

Captains and crews have seen the crew share of the lay system decline with the closures as the boat owners felt the need to retain funds to maintain the vessels. Unfortunately, even with increased landings, the lay has not reverted to former levels, and some of the crew and captains and their families have expressed dissatisfaction. Boat owners have stated that they need to keep the lay at existing levels due to increased insurance and other costs.

For review of earlier management, the closures seem to have caused more concern than the re-openings of Closed Areas I and II and Nantucket Lightship. The value of landings declined substantially in the time period of the closure, from 1994 to 1998. The effects of the closure were felt throughout the fishing community, from the fishermen to the boat owners, gear providers, service providers, and the families. At one of the public meetings to assess the effects of the groundfish closure, a New Bedford ship supplier described a substantial loss of business and concerns that his family would not continue the business past his retirement. A fisherman's wife and daughter described increased stress due to declining income and lack of knowledge of when the pressures might abate and how she responded by “OK . . . maybe I drink a little too much.” In general, though, most of the response to the stress was kept in the family and not extended into the community at large.

In addition to the discussions at the meeting, gear and fuel supplies and a boat yard told of declines in business. The shipyard had little business during the closure, but with the re-openings vessels have been in the yard for hull repair and maintenance. They and some boat owners expressed concerns for safety that came with the delayed maintenance. The fuel supplier found that while with area management the need for fuel was somewhat lessened than otherwise, it was substantially improved from the time of the closure. The major supplier of scallop gear suggested that the re-openings were beneficial in that they no longer needed to “carry” the accounts for their customers. However, the re-opening came with a new requirement for a 10" twine top and that did cause difficulty. At the time that the requirement was set, no one was making that size mesh and their supplier in Portugal needed a one year lead time.
New Bedford takes pride in being the top fishing port in the nation on the basis of the value of landings. The local paper, the Standard-Times had an article touting this news, and the fishermen put bumper stickers on their cars and trucks to broadcast the news. Despite the benefits of the re-openings in terms of cash influx and re-gaining number one status, there could be some problems if other re-openings bring a large number of transient vessels into port at the same time. At present, the harbor is so full that the Harbor Development Commission is considering adding more dock space by adding a floating dock. Part of the reason the harbor is full is the restrictive regulation on groundfish and the movement of vessels from Boston and other ports.

One boat owner told of dissatisfaction with the value of scallops during re-openings due to a glut of what would normally be a high value product. Before Nantucket Lightship opened he said, “You watch, when they open Asia Rip the price will go down on those prize scallops.”

There is a potential for congestion of vessels working on the fishing grounds. When the areas re-opened, vessels from nearly all ports participated as the scallops were so plentiful and large sized. During the closure, there was an increase in use of the southern New England area by vessels from New Bedford throughout the year, an area that tends to be used by the vessels from Cape May as well.

A potential secondary effect of area management has been a superabundance of scallops. With this abundance and a limit on days-at-sea two effects have been noted. The first is that captains are now shucking, and thus are not in the wheelhouse as much of the time as in the past. The second is that to shuck enough scallops to make a good trip, the crews are working long hours sometimes to the exclusion of eating. One fisherman’s wife told of the effects, “when my husband gets home, he’s shucking scallops in his sleep for the first couple of nights. His arms and shoulders are so swollen...” She also said that “in the summer, the guys come back emaciated, they can lose 10 pounds. These guys take supplements and look after themselves, but they come back in bad shape.”

At present there is a recognition that representation of FSF consultants, public participation, and the quasi-corporate to corporate structure of the industry has allowed a measure of resilience to proposed management strategies. The general opinion of most of the participants is that FSF will not allow the council to undertake to close large areas, and that smaller closures determined for improved yield per recruit should be less detrimental for the industry. In addition, individuals representing fleet owners also attend meetings, and they find that they tend to have enough political clout to get their ideas across - whether due to being recognized long term participants, or whether due to representation of a large segment of the fleet. Finally, one New Bedford informant in discussing the potential for boom and bust noted that the typical pattern has been for fishermen
who participated in the re-openings of the Georges Bank and Nantucket Lightship areas was to come up and take advantage of the openings with two trips - one that offloads in New Bedford and the next that offloads at "home." Typically, the industry is made up of business relationships that benefit both the fishermen and the processors, and the relationships serve to preserve resilience of both parties as the processor can count on product and the vessels tend to get better prices or better service from the specific processor. He also focused on the fact that the fishermen want to come home after a trip and that the factor alone would help account for trips not being focused in an area far distant for a long season. Other informants from the southerly ports also reported a similar pattern.

Due in part to the vastly improved stocks, there is no desire noted for buybacks at the present time. One owner-operator stated "if they were offered a few years ago, they would have been taken, but now that the fishery has come back nobody wants one."

New Bedford has been affected by buybacks for groundfish vessels. Two vessel owners noted the high number of vessels removed from the New Bedford fleet, and feel that the city has more than done its share with regard to removing vessels from fisheries. In addition, at a local meeting of fishery participants, this time to determine how to spend disaster relief funds that would come to the city for fishing, one New Bedford participant stated that she was concerned that the funding only went to boat owners. The recent buybacks were based on capacity, and she noted that the people who worked on the vessels contributed to that capacity, and so funding should go to the fishermen who built that capacity.

Vessel owners in Cape May, Seaford and Hampton Roads are also against a buyback, but for different reasons. These owners find that if they desire to purchase and retire a vessel to allow a themselves benefits of reduced competition that they can do so. In addition, one fleet owner discussed the concept that they would be paying not only for the vessels retired but also the governmental organization that would undertake the buyback. He preferred the less expensive alternative of purchase and retirement as opposed to supporting government that would undertake the buyback activity.

5.4 Individual Level Factors

Individual level factors remain important in community-based and co-management strategies for management. If individuals do not see benefit to participating in the community or co-management strategies, they find no reason to participate in the process although there may be lower costs in participating nor need they to follow the rules if the costs of rules may only be marginally higher.

5.4.1 Incentives to Encourage Individual Participation
In regard to the development of community-based co-management, fleet owners in Seaford and Cape May have had negative perceptions of the incentives to encourage participation. The fleet owners, who were willing to discuss community-based and co-management strategies, saw flaws in community-based and co-management situations. Neither found that the community (i.e., the municipality or county) offered services to the fisheries industry, and therefore, determined that there was no need to assist the municipality. Another factor that both brought up was concern with interaction costs in terms of time and having to interact with others before bringing up issues before the NEFMC. This cost in terms of time and effort was not perceived to be counteracted by sufficient benefits to these fleet owners through participation with the appropriate municipality or county.

Of note with regard to incentives for individuals to participate in area management, the stock size and the allowable catches from those areas may not in all cases be sufficient to induce harvest in those areas. The reopenings of Georges Bank and Nantucket Lightship were characterized by scallop densities that resulted in full dredges at the end of 10 minute tows, and catches far in excess of those available in other areas. Taking these circumstances in conjunction with the fact that New England scallops tend to have the highest prices per pound, it made good sense for scallopers from the local area and further distant to take part in the reopenings of Closed Areas I, II and Nantucket Lightship.

In contrast, the Hudson Canyon and Virginia Beach-North Carolina areas have been reopened for the past two years. In 2001, 55% of the TAC was harvested from the Hudson Canyon area, and 50% of the TAC was taken from the Virginia Beach area. Nearly all of the catch from the Hudson Canyon area was taken over nine months, but the Virginia Beach catch came in a two week window in mid-October. In 2002, 12% of the TAC was harvested from the Hudson Canyon area and none was harvested from Virginia Beach (http://www.nero.nmfs.gov/ro/fso/rpts.htm). An owner operator from Cape May and another captain from Cape May speculated that the only reason that any catch was taken from Virginia Beach was to have a history of using re-opened areas in case it could become a requirement for accessing future re-openings. The Hudson Canyon reopening seems in its second year to only benefit small dredge permit holders, and at least one captain in Cape May suggested that he would change from his part-time dredge to full-time small dredge to take advantage of that option next year.

Finally, there have been some issues with a poor yield per recruit for the Virginia Beach closure. While large numbers of small scallops were discovered and the closure was initiated to allow scallops to grow to harvestable size, the outcome has been a smaller population than was anticipated. Some informants have attributed the poor recruitment to harvest by fluke fishermen under the allowable 400 pounds of the general category access permit as bycatch. Other
informants have attributed the poor recruitment to Hurricane Floyd which they said
disrupted the bottom in the Virginia Beach area

5.4.2 Rules, Equity, and Effectiveness of Enforcement

5.4.2.1 Local Rules, Equity, and Effective Enforcement

Of the municipalities studied, New Bedford and Newport News have some
local management of the fisheries which could be considered as proxies for
community participation in co-management.

At the municipality level, New Bedford has had some problems with
equitable and effective enforcement of rules with regard to the harbor. Informants
described a situation in which some fishery participants and some of the service
providers are not paying their share for access to and use of the dock facilities.
Most attribute this to a health problem on the part of the harbormaster which
makes it difficult for him to get out and check on the docks sufficiently. Although
none of the informants wanted to see the harbormaster removed; he is a font of
information and a respected person in the fishing community, but concern and
compassion for this gentleman also means that enforcement of the local regulations
often does not occur. This could begin the spiral to a lack of legitimacy of local
management, and rebuilding of that legitimacy should be undertaken.

The Newport News Seafood Industrial Park supervisor is available to work
with both fishermen and with agency authorities for services needed at the
industrial park. No one interviewed expressed problems with the rules relative to
the industrial park, so apparently the local rules are deemed by users to be credible,
and what enforcement is done is equitable and effective.

5.4.2.2 Enforcing Spatial (Area) Regulations

In regard to area management, there have been some concerns over credible
rules with equitable and effective enforcement. Among the concerns are micro­
management of the scallop fleet, no guarantee of re-opening of areas, litigation of
the decisions, location and size of new closures, periodic gluts of scallops that
reduce the price per pound, health and safety issues, and interpretation of
regulation by enforcement authorities.

One concern with regard to the credibility of rules with regard to area
management is over the potential for “micro-mangement” of the scallop fleet.
Despite the concerns expressed that areas designated for closure should be as small
as possible, some informants are concerned that there may be requirements to enter
re-openings as harvests may be restricted to those small areas. Some of this
concern stems from the prolonged pressure for harvest from the Mid-Atlantic
areas, with less effort in New England due to the renewed closure of the Georges
Bank and Nantucket Lightship areas. One fisherman asked “How much longer are they going to pound this area (Mid-Atlantic)? I realize they may be protecting areas in New England because it is the New England Fishery Management Council, but this area’s been pounded for a long time.” He was implying that sending effort south was seen as adequate by the NEFMC, but that allowing more effort in the north would reduce harvest pressures in the Mid-Atlantic.

A concern voiced by several informants was the potential for areas to be removed from harvest and never re-opened. In the Mid-Atlantic, the phrase came up of areas entering “a black hole,” or gone and never to return. All informants seemed to agree that there needed to be a guarantee of re-opening. FSF has proposed that areas reopen by a specified date. Others have phrased that they want to see a sunset provision on closures with time periods ranging from three to five years. These concerns appear to stem from a lack of re-opening of all of Nantucket Lightship, due to what one informant suggested was a problem with enforcement as she had heard that the Coast Guard felt they could not enforce regulations in the closed portion area of Nantucket Lightship.

In light of recent activity of some environmental groups to further restrict fishing, some informants expressed concern that decisions will not only be made by the council, but also by a judge who may or may not have previous experience with fisheries. The concerns focus around litigation that may inhibit re-openings or increases in catch, which could be detrimental to fishery participants.

Particularly troublesome to some of the informants was the selection of new areas to close and the size of the closures. FSF and other informants have suggested that less highly used areas be closed to induce scallop grow out in those areas, and that currently productive areas can stay productive until the new areas are well populated with recruits. In addition, the size of the Georges Bank closures caused great consternation as large areas of formerly highly productive areas were removed from harvest. None of the informants desire to see the decline in harvest that this produced and the stress on individuals, communities and families.

As noted earlier, some concerns were expressed with regard to gluts of scallops due to reopenings or the seasonality of openings. The re-opening of Nantucket Lightship had a corresponding decline in the value of channel scallops, as there was a glut with the re-opening of Asia Rip. In Virginia, one informant suggested that careful consideration of timing of openings might be beneficial to moderate the periodic glut of scallops that he would get as a processor.

Health and safety issues may be particularly vexing in area management for scallops due to the desire to reduce work pressure on captains and crew. Two wives from disparate geographic areas (New Bedford and Seaford) have discussed concerns of long hours and the pressure to make as much as possible from each trip due to the restrictions on days at sea and crew size. Despite suggestions to increase
crew size or increase days at sea, there is a strong potential that at least some of the captains and crews will work long hours the entire time only increasing effort. One safety issue that has been addressed was that related to requirements to have gear disconnected in transit to the re-opened areas and rigging up at sea. In rigging up gear, one man was lost at sea due to this requirement, which has subsequently been changed.

One issue of interpretation of regulation came up in discussions of the definition of trip quota. Several informants were concerned that if they ran a pound over the quota, they would be subject to punishment that could well outweigh the offense. They recognize that they can fairly closely estimate the pounds per trip, but that there should be some slip built into quota for individual trips. In compensation, if the first trip into one of the reopened areas ran a bit high, averaging over two or three trips would be considered appropriate. An alternate measure of compensation that the informants were willing to consider was that they would only be paid up to the quota level, and that the overage would be donated to a local food bank, so that while the fishermen still had the costs of harvesting the whole amount, they would only be paid for the amount that fell within the quota limit.

A final concern of area management is the enforcement of area closures through the use of vessel monitoring systems (VMS). One informant described a situation in which he had complied with having VMS installed, but the installation was not done correctly by the company hired to install the equipment and water leaked into the computer. Not only did he have to replace his equipment at his own expense, but he was subject to suspicion that he had not installed equipment in the first place. The same informant discussed concern with regard to interpretation of VMS positions as interpreted by the Coast Guard. He was nearby when the single case of VMS notification of Coast Guard showed a vessel within one of the closed areas. He expressed concern that he had heard the radio communications between the fishing vessel and the Coast Guard vessel in which the fishing vessel operator was told that he should not have been within a mile of the dividing line between the closed area and the area open. The informant expressed that it was common practice to fish as close to the closure as possible to gain any spill over of scallops that may have begun in the closed area and that the Coast Guard interpretation was certainly not the way the regulation was written.
Chapter VI

Summary and Recommendations

6.1 Summary

This study had three major objectives: (1) determine community and stakeholder preferences about area management strategies for the sea scallop fishery for the purpose of developing community-based, co-management strategies; (2) determine community and stakeholder preferences and support for a buyback program; and (3) develop strategies in cooperation with stakeholders that mitigate the potential negative social and economic consequences of area management strategies and buyback programs.

Early in the study, it became apparent that in order to focus on the three major objectives, it would be necessary to determine exactly what constitutes the community. Four geographic areas were selected for study because they represented potentially different types of areas in terms of social and economic characteristics. The four communities were New Bedford, Cape May, and Seaford and Hampton, Virginia. The social and economic characteristics of the four communities were described and analyzed to better assess the potential relationship between the fishery and the community. In addition, researchers spent considerable time living in the communities for up to three weeks at a time; the purpose of which was to better obtain information about community and stakeholder concerns. It was soon discovered, however, that many of the vessel owners, captains, crew, and their families did not even live in these immediate areas. For example, several captains and crew that operate out of Cape May live in various towns or communities in North Carolina (e.g., New Bern and Beaufort). The absence of well-defined communities clearly complicated efforts to determine preferences for area management strategies and buyback programs, and to involve the community and stakeholders in the management process.

It, thus, became necessary to seek out the guidance of local municipal officials regarding concerns about area management and buyback programs. It was thought that local municipalities would be greatly concerned about management strategies that might displace workers and infrastructure. There appeared, however, to be a general apathy on the part of municipal officials; alternatively, there did not appear to be widespread interest even in the ongoing plight of commercial fisheries. Government and industry officials in New Bedford demonstrated the greatest level of knowledge and concern about fisheries management in general, but little knowledge about area management. Officials in New Bedford, however, were familiar with the use of buybacks to reduce...
harvesting capacity in fisheries, but did not indicate any major concerns about the use of buybacks in the sea scallop fishery.

As time progressed in the study, members of industry increasingly suggested a need to change the present management regime from the present area and input control system to a quasi-private property rights regime (e.g., individual transferable quotas). Industry, particularly vessel owners, also strongly indicated that did not desire to have a buyback program. In general, active operators and crew did not appear to be overly concerned about negative consequences of area management or buybacks. Of course there were some concerns such as overcrowding at docks, market gluts of product, localized displacement of workers, and congestion on fishing grounds. Solutions offered by stakeholders were found to often been so widely different that there was simply no way to adequately implement proposed solutions.

Despite the numerous problems, it was possible to determine that community-based, co-management was not a highly probable approach to consider for managing this fishery, particularly relative to area management. That does not mean, however, that stakeholder concerns should be ignored. Research for this project also revealed that the framework of more traditional approaches used to determine the feasibility of community-based, co-management needed to be modified to reflect community isolation and community dependency. In addition, this research developed some basic measures of economic diversification and dependency for the various communities examined in this study. It was found that the economies of traditional fishing communities such as New Bedford had become increasing diversified in the past 10 years; in contrast, however, the economy of Cape May, although becoming more diversified over time, had the least diversified economy of the four major communities examined in this study. Last, it was possible to identify community concerns, and offer some recommendations to address those concerns expressed about area management and buyback programs.

6.2 Community Concerns and Recommendations

At the present time, there is difficulty in incorporating community concerns into fisheries management and regulation. In part, these difficulties stem from divergent opinions as to what level of community should be represented; a lack of communities being viewed as stakeholders; and a preference by some fishery participants to have rules the same throughout the wide range of the fishery. There is also an apparent apathy on the part of municipal officials regarding the viability of commercial fisheries; without proper support from the municipalities, it is difficult to adequately determine the means by which stakeholders can adjust to area closures and vessel reduction programs (i.e., buybacks). Last, there appears to be an increasing interest by industry on the use of individual transferable quotas rather than the existing program of area management. Despite these difficulties, it
is possible to offer recommendations to help communities adapt to area management and buyback programs.

6.3 Recommendations for Area Management

To address concerns that were discussed within the fishing communities and industry, several ideas could be incorporated into the development of area management strategies. These ideas include determining the size of the area and the distribution of specified management areas; developing incentives for use; timing openings of areas to prevent market gluts; imposing reasonable and equitable enforcement criteria; and a guaranteeing that at some point, areas will be reopened to fishing.

6.3.1 Size and Distribution of Specified Management Areas

Industry is concerned that future closed areas could be as large as Areas I and II. To counteract that concern, industry through FSF has requested that areas be as small as possible to protect juvenile scallops but also allow for growth of scallops. This recommendation appears sound with the proviso that the areas are large enough and properly situated (not too near shore for rapid entry and exit) for proper monitoring and enforcement of closures.

In addition to the size of closure, there is a suggestion that at least some portion of areas that are either currently productive, or were productive in the past, remain accessible. Industry has suggested that areas be designated by the presence of small scallops, but that areas with a mix of large and small scallops remain open. To provide clarification of this issue, consultation with FSF and/or the scallop advisory committee and the industry advisors committee regarding their interpretation of what mix of size of scallops would be acceptable to place into special management areas should take place. This information can then be used to help determine the areas to be closed. In addition, some areas that are not seen to be as productive may be worthwhile to close for short periods to determine if simply lessening disturbance may induce spat set and recruitment. Another factor to consider is if one of the areas has good spatfall, but does have good recruitment (as the Virginia Beach closure shows), the risk will be lessened to have small areas set aside rather than placing all expectations on one larger area.

Particular concern has been expressed to reopen the Georges Bank closures and Nantucket Lightship areas again as three years will have gone by between the last opening. The areas that have been closed for the entire time have the reputation of being filled with "clappers" (scallop shells that are the remains of dead scallops), and some members of the fishery are quite concerned that there is available stock that they are not permitted to access. Re-opening some of these areas again would be beneficial for New Bedford fishery participants and those who can travel and find economic benefit to take advantage of the reopenings.
This will help decrease harvest pressure on more southern resource areas, and could allow some areas of the Mid-Atlantic to be more heavily fished by Mid-Atlantic vessels.

Finally, if areas are to be small, then to avoid the potential for boom and bust for specific ports, distributing those areas throughout the scallop range is essential. The closure of Georges Bank that affected both the groundfish fishery and the scallop fishery was detrimental to the community of New Bedford as little of its base industries remained active and there was a need for alternative employment and education for those affected. If several small areas are distributed throughout the range, no one community and no one group of industry participants should be harder hit than others with closure, and with multiple reopenings throughout the range the potential for concentrating effort into one or two areas should be reduced.

6.3.2 Incentives for Use

At present, the allowable quota for the re-opened areas of the Mid-Atlantic are not perceived to be sufficient to induce participation for most of the limited access vessels. The only group of permit holders to find much benefit in entering the Hudson Canyon area are those with small dredge vessels. This has created a privileged group among the limited access holders, and others find it inequitable. To offset this concern, as well as to induce harvest among limited access vessels, the quota from the reopened areas will need to be equal or higher than the expected catch for the days-at-sea tradeoff from areas that are generally accessible.

6.3.3 Timing of Openings

An issue brought up by a processor in Hampton Roads, as well as by a boat owner in New Bedford, was the fact that at certain times of the year, landings are so high that the market is glutted, and as a consequence, prices and revenues decline. Timing the openings of areas across the range may assist in keeping down the possibility that vessels will save their days-at-sea to take advantage of the opening of a single area, which is thought to have been done with the reopening of Nantucket Lightship. In addition, having the openings last for an entire year rather than a few months should allow the vessel owners and operators to decide when to harvest within the reopened areas. The short window of the prior re-openings was another factor that may have promoted a run on those areas and market glut.

6.3.4 Enforcement Criteria

Stakeholders, particularly vessel owners, operators, and crew, have expressed to major concerns regarding enforcement. The first of these issues is the legal interpretation of the areas, and the second is the interpretation of the quotas.
At the present time, there has been the interpretation by the Coast Guard that fishermen should not be within a mile of the designated areas for closure. VMS and GPS are supposedly good to within three meters. A designated closed area has no buffer. A reasonable question is which interpretation is to be used in general practice. If at least a rule of thumb were distributed, lessened confusion may yield better response to determining which areas should be closed and may enhance compliance due to knowledge of what the Council has determined.

With regard to the quota from the areas, informants expressed concern about going over the quota by as little as a pound and no statement as to what would be the expected level of punishment. They have suggested that either the overage be donated to a food bank with no compensation to the fishermen or that catches be averaged. While averaging catches over two or three trips may be acceptable to fishermen, it would mean computer monitoring of catches and a requirement that all dealers participate in the system so that the averages could be taken whether or not the fisherman returns consistently to the same port. While a potential solution, it may prove difficult to enact. Donation of overage to a food bank may be acceptable if only a reasonably small amount, but there would need to be an understanding of how much could be donated without censure as resource protection would require monitoring the amount taken from the special management areas and enforcement of those rules would still be required.

6.4 Recommendations for Buyback Programs

At present there is no perceived need for a buyback, federally funded or otherwise, by members of the scallop industry. Several reasons are given for the lack of a need for buyback, including that all participants are managing to make a living on the current days at sea and with the current stock. If fleet owners perceived a need to retire a vessel with whom they compete, they would prefer to purchase it and retire it themselves rather than have the Federal government serve as intermediary. The addition of the government is seen as adding a layer of decision-making which the boat owners would be required to pay, so it is not perceived as worthwhile.

Despite these concerns, the fishery still has excess capacity. There are a number of procedures outlined for setting up buybacks in the MSFCMA, and those requirements may inhibit development of alternative buyback strategies. If a buyback should be determined to be necessary in the future, those requirements would apply. Alternatively, the National Marine Fisheries Service (NOAA Fisheries) has specific guidelines and requirements for conducting a formal buyout. A major aspect is that the program is voluntary, and therefore, no one has to participate in a buyback. In light of stakeholder concerns and a lack of support for a buyback of either vessel and/or permits, the recommended option is to maintain the status quo of no buyback for the sea scallop fishery.