

APPENDIX



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Literature Review

In order to contextualize and understand the challenges faced when dealing with economically and environmentally sensitive communities such as the Port of Belford, a review of existing reports pursuant to fisheries, aquaculture, shellfishing, and processing facilities and techniques practiced within the Northeast region and more specifically in New Jersey is provided below. Both past and present land use policies and zoning regulations specific to Middletown and the study area are also included.

Belford, New Jersey. Community Profile Project. Rutgers University. 2003. Jones, S.K. Barbara, et al.

This 2003 report defines the historical significance of the waterfront areas along the Raritan and Sandy Hook Bays and provides an overview of the existing social and economic conditions of Belford during the 2000 Census. It is noted that 17 individuals or 2.2 percent of employed Belford residents work either in agriculture, forestry, or fisheries. The per capita income was \$25,412, more than \$5,700 less than the Monmouth County average.

Originally called Shoal Harbor, records indicate that Belford is approximately 200 years old and has had ties with the fishing industry since before the Revolutionary War. Founded in 1953, the Belford Seafood Cooperative is believed to be the oldest continually operating fishing cooperative on the east coast.

Pollution from the refineries and factories that lined the northern and western areas of Raritan Bay and the completion of the Garden State Parkway in 1957 significantly contributed to high pollution levels in the Bayshore waters, and to a lesser extent the Sandy Hook Bay. By the mid-1970's fish and shellfish caught in the area were no longer safe for consumption. Water quality improvements over the past twenty years have encouraged planners, developers, and environmentalists to reinvest in the area, for both economic and environmental purposes. The report identifies the Belford Ferry as one of the primary reasons leading the Belford area to be the heart of revitalization efforts. However, local residents and fishermen are concerned about the significant increase in property values and taxes over the past few years. There is also concern that incoming residents will complain about the visual appeal and smell of the port area and threaten their way of life.

Revitalization efforts by both the Township of Middletown and Monmouth County have come by means of road and bridge improvements. While the municipal governments insist such improvements have been to increase the viability of commercial fishing, fishermen disagree. Additionally, there is some discrepancy as to how fishing in the area should be classified: recreational or commercial. Yet the 2002 Middletown Master Plan recognizes the importance of the commercial fishery in Belford and the significance of the waterfront. In doing so, Belford was defined as a fishing village.

It is thought that the installation of a fishing and aquaculture facility should be used as an opportunity to protect the cultural heritage along the waterfront while earning a living. As a primary producer, one committee member indicates that the money generated from commercial fishing multiplies at a rate of between four and six and it therefore a significant financial contributor to the economy. Additional changes proposed in Belford include the now built residential development The Dunes, a marina, a mixed retail shopping area, and the Bayshore Technology Center which would be used for fish farming and clam depuration. It is anticipated that the Center would cost millions of dollars but would in turn generate jobs and growth in commercial fishing.



The clam depuration facility is desirable to local fishermen as it is viewed as the “transfusion in the arm.” Presently, the Highland plant is used by Belford fishermen for such activity. Some have proposed the use of the old seine house as a possible site for the depuration facility and, further claim that it will not interfere with the new residential units. The report claims that the New Jersey Division of Fish and Wildlife is against the building of a depuration facility because of issues regarding regulation and water quality.

The Belford co-op was built to protect local fishermen from the constantly changing prices received for their fish and to increase market opportunities. The adjacent area that has since been converted to fulfill the services offered by the Belford Ferry Service was heavily disputed by fishermen who thought the ferries would interfere with their use of the creek. However, they also knew that having the parcel used for such services was better than other development options. While some view the ferry services as an economic benefit, others are still unhappy with the decision.

There are approximately twenty to thirty boats associated with the Belford Seafood Cooperative, and about forty boats using the port on a regular basis. There are additional fishermen who would like to join the co-op however they are not currently taking new members. In 2000, the average vessel size was slightly less than forty-eight feet. There are no 80-foot boats in the port. Species sold by the Cooperative in the early 1980’s included but were not limited to fluke, whiting, ling, lobster, and clams.

The port is unique in that it is still primarily a baymen’s port, largely because of its inshore location. Boats and equipment are modified based on the season and time of year. Several of the fishermen rely on clamming to get them through the winter months. Bunker fishing during the summer has become somewhat of a political issue because of competition with recreational fishermen.

Study of the Fishing Industry at the Port of Belford, New Jersey. Port Authority of New York and New Jersey, 1985. Grant, George, G. Charles, Brian Harris and Bonnie McCay.

This study was prepared by Princeton Economic Research, Inc. (PERI) in 1985 for the Port Authority of New York and New Jersey. The study sought to examine the existing conditions and patterns in commercial fisheries in Belford; to identify the potential and need for the expansion of such establishments; to design a conceptual master plan to that will be appropriately matched with existing needs and identified growth potential; to examine the relationship and balance between the commercial fisheries and adjacent land uses; and to prepare development scenarios which include financing options.

A series of interviews with local fishermen to determine existing need and concerns concludes that 1) the lack of space for berthing, off-loading, servicing of vessels and storage of gear, supplies, etc. and 2) the inability to purchase or obtain a long-term lease on the land currently used by the Belford Co-op and additional berthing activities are the primary concerns, with more than 75 percent of respondents indicating as such.

An examination of the historical context of Belford, existing operations, resource availability, and market penetration was used as a mechanism by which to evaluate the potential and opportunities for an increase in economic activities. The PERI study concludes that despite many of the hardships the fishermen have endured during their long history in the Belford area, it is highly probable that the



Belford fishery can continue to act as an economic engine for the area and if given the opportunity, an expansion of existing facilities will be able to sustain a moderate rate of internal growth.

The Belford landings account for approximately one-third of the finfish available within 30 miles of the New York Harbor and only 3 percent of waters between 30 and 125 miles offshore. Area fishermen have indicated that with an upgrade of existing facilities that they would consider purchasing larger vessels, which would allow them to fish further off-coast. Assuming this, the PERI study finds that with a facility expansion and an internal growth rate of 10 percent that finfish volumes have the potential to rise between 50 and 60 percent of their current level.

Lobster landings at the Belford port generated approximately \$660,000 in 1984. A recent federal lobster management plan has been implemented which regulates the minimum weight of lobsters available for harvesting. While there was an initial decline of approximately 30 percent in lobster harvesting in New Jersey the year after implementation, the years following had an increase of approximately 80 percent. However, this data is largely based on statistics from a number of states. The PERI study anticipates lobster harvesting in the Belford area to remain relatively stable in the coming years.

Despite measures that have been implemented to improve water quality, there is still a considerable amount of sediment on the water's bottom which prohibits the (re)opening of large-scale shellfishing beds. As a result, the PERI study concludes that the potential to revitalize the shellfisheries in the Raritan Bay is not optimistic. If the proposed spawner sanctuaries for hard clam depuration are opened along coastal waters in central and southern New Jersey, it is anticipated the clamming within the area will maintain its presence in the area.

The 1982 closing of Seacoast Products had a significant impact of the area. Between 1982 and 1984, landings at the Belford port decreased from 7.5 million to 2 million pounds. Studies indicate that a fish meal plant would be able to sustain the ample supply of fish, however, the economic viability of such is largely dependent on outside economic conditions such as worldwide protein prices and the strength of the dollar. The introduction of a large-scale industrial operation has the potential to revitalize and further induce redevelopment efforts on neighboring properties and may result in the return of local boats that have sought other ports that have proven to be more advantageous.

There are a number of companies in the area that have expressed interest in using the Seacoast buildings for aquaculture to raise brine shrimp, sea scallops, and shrimp. Such use of the Seacoast buildings will not directly involve local fishermen but has considerable potential to increase revenues for future development.

The PERI study finds, based on existing need and demand projections, which the Belford port would benefit if space was provided for 75 boats, both those from the Co-op and independent, at a depth of 10 feet and 55 feet long. Between 8 and 10 boating slips should be for vessels up to 65 feet long. The operating, storage, and off-loading space should be increased to 30,000 square feet of building space on 4 to 5 acres with truck access. An additional 7 to 8 acres including but not limited to the storage of gear, net drying, etc. should be included in redevelopment plans.

A number of locations were evaluated for their feasibility to house the new facilities for the Belford commercial fisheries. Based on a number of indicators including operational cost estimates and environmental considerations, the study recommends that the west bank of Compton's Creek be used solely for expanded shoreside operations and facilities while the east side is limited to berthing



activities. In keeping such uses on the west bank, a major widening of the Creek on the east side and extensive infrastructure improvements will not be necessary. This would also minimize the adverse impacts that would otherwise be incurred of dredging were to be performed. It is anticipated that the rehabilitation of the west bank and stabilization of the east bank will show a reduction in siltation in the Creek bed and minimize erosion. The above-mentioned improvements are estimated at \$7.5 million.

The redevelopment of the adjacent (factory) property has spurred concerns regarding the over use of the Creek frontage and backlands. Government agencies have expressed considerable interest in the continuation of the Belford fisheries, and as a result it is highly likely that any redevelopment of the adjacent parcel would likely support such enterprises. Given this, the PERI study concludes that a mixed-use development would offer few benefits to the industry. However, mixed-use development does not propose detrimental effects on the other portions of the Seacoast parcel.

The Status and Condition of New Jersey's Marine Fisheries and Seafood Industries. New Jersey Department of Agriculture, 1995. McCay, Bonnie, George Grant and Adesoji Adelaja.

Commissioned by the New Jersey Department of Agriculture, this study is designed to act as a resource guide for members of the industry, legislators, and government agencies on the status and trends of commercial fisheries. This study is intended to be used for those responsible for planning and dictating the future of New Jersey's fisheries.

The study can act as the backdrop for engaged parties to begin pertinent discussion focusing on problem definition, needs assessment, the exploration of alternative solutions, policy planning, and impact assessment. There are numerous factors that have prompted the need for such a study: the depletion of the fish and shellfish supply, state and federal regulations related to the harvesting of such supply, conservation concerns, the position of New Jersey and U.S. seafood in global markets, marine recreational industry, and opportunities for aquaculture.

New Jersey's commercial marine fishery landings play a significant role in the supply of certain fish throughout the country. Such fish species include but are not limited to seas clams, black sea bass, ocean quahogs, scup, squid, Atlantic mackerel and bluefish. Both the poundage and the value of fish brought through commercial marine fishery landings in New Jersey more than doubled between the early 1980's and early 1990's. Approximately 196 million pounds with a dockside value of \$96.3 million was generated in 1993. Worrisome though is the fact that the amount and value of edible seafood landings have not kept pace with inflation, landings of lower value species are replacing higher value species, New Jersey prices overall are below the national average, and of serious detrimental effect is that the economic return to harvesters has not grown at the same pace at which shellfish volumes have increased.

While surf clams and quahogs still dominate New Jersey's commercial fisheries, changes in the geographical distribution of landings are affecting landing volumes. However, total landings by county in 1993 show little change over the past decade in terms of the distribution of commercial fishing efforts. The study finds that landings in Monmouth County have the greatest diversity of species and that Belford has seen a significant increase in ocean quahog and squid landings. Traditional fisheries, such as fluke, whiting, and ling, have seen a significant decline. Belford has been victim to such a decline and as a result has increased the number of landings for squid, surf clams, and quahogs. This has helped increase retail potential.



The National Marine Fisheries Service (NMFS) finds that the majority of vessels in the state are old, generally from the mid-1970's. Vessels in and around Cape May tend to be the largest while smaller vessels dominate other port areas. The scarcity and high maintenance costs of adequate docking facilities are among the leading factors limiting both commercial and recreational fishery landings. Belford is cited as one such port that suffers from such limitations and continues to struggle with development pressures.

In 1993, polluted waters across the state resulted in an increased dependence on special state programs for the harvesting of both soft and hard clams. In 1993, approximately 48 percent of hard clams harvested in New Jersey were dependent on such programs.

By the early 1990's, aquaculture represented a significant portion of worldwide fisheries value, approximately 40 percent by 1991, a considerable gain from just seven years earlier. Approximately 16 percent of fish and shelling landings were generated through aquaculture. However, the United States accounted for only about 4 percent. At the time when this report was released, aquaculture nationwide was increasing steadily however, not as rapidly as global trends.

Catfish, crawfish, trout, bait-fish, and oysters are the dominant species in U.S. aquaculture yet large gains in the past decade include salmon, shrimp, and tilapia, and a variety of other species. More than 70 percent of the annual oyster harvest value comes from aquaculture practices. There is considerable potential to increase the harvesting of hard clams using aquaculture techniques, it is currently the states major aquaculture activity, yet represents only 21 percent of the harvest value in 1992.

A study from 1983-1992 found that output prices for species harvested through culture production have performed better than those which have been harvested through fresh water methods. New Jersey, with approximately \$2.4 million in profit, represents less than 2 percent of the northeast region aquaculture value. It ranks fifth out of the twelve northeastern states in the production of marine species.

Climate conditions and the seasonal change in water temperature have raised concerns about certain species being produced in the northeast region. Yet these challenges and constraints can lead to opportunities if adequate measures are mitigated. A state plan has recently been completed and accepted by the Governor for aquaculture development. A recent survey indicates that consumers are aware of aquacultured products and typically judge them on factors other than price, including but not limited to higher quality, "environmentally friendly", and safer than non-aquacultured products. A retail survey indicates a discrepancy between retailers' appraisal of what consumers are looking for and what consumers say attracts them. Restaurants and other food service establishments see the same benefits to aquacultured products as consumers yet are concerned about the disadvantage of such products as they have the potential to result in higher prices, less flavor, and limited variety.

There have been considerable changes in the processing of marine species over the course of the past decade. Shifts in processing are largely due to a decline in the oyster industry and independent ocean clam shuckers in addition to the explosive emergence of frozen prepared products on the market.

There is a weakness in relying on the NMFS for reporting information on processing activities as it is a voluntary system NMFS has a voluntary reporting system. As a result, many processors do not participate. The number of New Jersey firms reporting such activities decreased from 28 to 18 between 1983 and 1992. Of those reporting, employment decreased by approximately 260 persons.



Average employee size per processing plant increased by approximately 6.5 persons during the same period indicating that those establishments that either closed or stopped reporting had a smaller employment base.

In terms of both processing plants and employees overall, the Mid-Atlantic region was hit hard between 1982 and 1992 when the rest of the U.S. experienced growth. However, New Jersey performed better than the rest of the Mid-Atlantic region. A 1988 survey found that approximately 31 percent of seafood processors were dependent on species caught in New Jersey. Oyster shucking and mussel processing largely rely on products brought in from out of state. Surf clams and ocean quahogs are the most valuable for processing. Oyster shucking represents a smaller percentage of the total processing value than it had in the past.

A 1988 survey of seafood processing plants, 19 newer and 29 older, sought to assess both the advantages and disadvantages of having operations in New Jersey. Proximity and access to markets and ports, availability and quality of raw products, state image, low shipping costs, pollution regulations, and a variety of other indicators directly related to labor factors were among the identified advantages. Many of the perceived disadvantages are a direct result of some of the abovementioned advantage: unable labor, state image, an insufficient supply of raw seafood products, and the high cost of complying with state environmental regulations.

It was estimated that there were approximately 2,706 full-time employees in commercial fish harvesting in 1993: 1,950 in fish and seafood processing, 100 in aquaculture, and 860 in wholesale. Another 3,278 were estimated to work in retailing. It is estimated that approximately 9,100 persons were employed in all sectors of the commercial fishing industry. Therefore, assuming a multiplier of 2.4, approximately 21,840 New Jersey jobs are directly or indirectly related to the state's commercial fish and seafood industry. Another 9,700 are directly linked to the state's marine recreational fisheries. In 1993, commercial and marine recreational fisheries contributed approximately \$1,362 million the New Jersey economy – this number does not reflect contributions made to the federal, state, or local governments which is expected to exceed \$100 million.

Changes in species population and harvesting restrictions affect not only New Jersey but the entire Atlantic coast. Those species classified as “underexploited” are those which have relative prices associated with them since they have low levels of demand in the marketplace. Such species include but are not limited to Atlantic herring, Atlantic mackerel, butterfish, skate, and dogfish. Species essential to New Jersey fisheries that are classified as “overexploited” include fluke, winter flounder, black sea bass, tilefish, lobster, and sea scallops. “Fully exploited” fish include whiting, bluefish, and ocean clams, which have considerable landings in the Belford area.

Surf clam and ocean quahog communities along the New Jersey coast have been significantly depleted and not shown signs of revitalization. As a result, some harvesting and processing establishments have moved north where current activity is higher.

The Status of Shellfish Beds in the NY-NJ Harbor Estuary. New York-New Jersey Harbor Estuary Program, 2002. Yuhas, Cathy.

The New York portion of the Raritan Bay, including all waters inside the Rockaway Point-Sandy Hook Transect, is classified as uncertified. Uncertified waters represent a closed market indicating high pollution levels. Special permits are needed in order to harvest species in uncertified waters. Shellfishing in New York waters is monitored by the New York State Department of Environmental



Conservation. There was a decrease in the number of acres harvested from 2001 to 2002. Despite water quality improvements, direct market harvesting in the Raritan Bay may not happen due to high levels of CSO discharges during wet weather. Only hard clams are permitted to be harvested in this area, however, there are restrictions on the size and quantity of such landings.

The majority of waters located in the Raritan Bay-Sandy Hook, Navesink River, and Shrewsbury River are classified as special restricted. Water classifications in New Jersey are determined by total coliform levels, which are assessed after a storm. Buffers are established around outfalls and marinas in order to prevent sewage treatment from entering waters where species are harvested. The Monmouth County Bayshore Outfall Authority's outfall is located 1-mile offshore in the Atlantic Ocean. There are approximately 36 stations which monitor water quality in the area.

Raritan and Sandy Hook Bays Sanitary Survey Report 1994-1997. NJ Department of Environmental Protection, 1998. Farnsworth, John.

For designated growing areas, this report is completed every 12 years. In addition to examining the conditions in such areas, the report addresses the request by the shellfish industry to reexamine the condition and quality of waters classified as *Prohibited*. In such areas, water quality improvements may raise the designation to *Special Restricted*. This change would permit shellfishing under special permits designed for depuration and relay.

Water samples in shellfish growing areas of the Raritan and Sandy Hook Bays conclude that total coliform bacterial water quality has not changed significantly since the last reevaluation report in 1989-1994. Water quality in the Sandy Hook Bay improved during the summer sampling season (May-October). The report recommends water quality testing to be performed during periods of high rainfall to determine how pollution levels change between periods. The study concludes that until this analysis is performed that the existing water classification remains unchanged. This study is performed in order to comply with the National Shellfish Sanitation Program (NSSP) and to provide input for the State Water Quality Inventory Report as part of the Federal Clean Water Act.

Raritan and Sandy Hook Bays Sanitary Survey Report 1997-2000. NJ Department of Environmental Protection, 2004. Zimmer, Bonnie.

This report is an updated version of the above-mentioned *Raritan and Sandy Hook Bays Sanitary Survey Report from 1994 to 1997*. Water samples were gathered in order to analyze the amount of toxicants, heavy metals, and organic compounds in the area waters. Samples were also gathered to examine the potential adverse impacts of the Middlesex County Utilities Authority discharge.

Sampling results from 1997 to 2000 in the Raritan and Sandy Hook Bays indicate that the total coliform bacterial water quality in shellfish growing waters has improved slightly since the previous sampling period, 1994 to 1996. This follows area trends of overall water quality improvements. Such results lead to an upgrade in the waters from *Prohibited* to *Special Restricted* in the triangular area to the west of Sandy Hook known as Flynn's Knoll and a smaller area just west of Conaskonk Point. These areas and their corresponding upgrades constitute approximately 5,714 acres.



New Jersey Fishing and Aquaculture: Harvesting the Garden State's Waters

New Jersey harvests approximately 100 different species of fish and shellfish each year. More than 170 million pounds valued at over \$120 million were brought ashore by New Jersey boats in 2003. The state has 6 major fishing ports, one of which is Belford. The commercial fleet has more than 1,500 vessels which employ more than 3,000 fishermen. There are 15 processing plants and 81 wholesalers employing an additional 2,200 workers.

Introduced in mid-2005 as a marketing tool, the New Jersey Department of Agriculture has branded the term "Jersey Seafood" for all fish and shellfish caught or cultivated in the state. Not only does this satisfy national labeling requirements but also ensures the freshness of the product itself. As a result, a grant of \$47,100 was awarded to a number of aquaculture producers to market clams.

In partnership with entrepreneurs, local fishermen, and government agencies, the Bayshore Development Office has proposed a commercial fishing and aquaculture project at Belford's Compton's Creek. The proposal includes an aquaculture development facility, a seafood cooperative which would permit the expansion of an existing restaurant, and the construction of a fish market. As part of the Bayshore Development Office's proposal, the aquaculture facility would use high hydrostatic pressure (HHP) which is a technique that increases both the safety and shelf life of the product. Hardshell clams would be the dominant species of the aquaculture facility and would also have a hatchery, nursery, and grow-out facilities.

There are two depuration plants in Monmouth County, one of which is privately funded and the other is supported by a number of grants. After the first plant opened, the number of clambers and the harvest grew by approximately 50 percent.

National Standard Eight and Processing Labor: An Assessment of Processors in the Mid-Atlantic Region. Report to the Northeast Fisheries Science Center, NOAA Fisheries. Gloucester Point, VA: College of William and Mary, School of Marine Sciences. Kirkley, James E., Bonnie McCay, Bryan Oles, Winifred Ryan, Satsuki Takahashi, and Wendy Weisman. 2005.

This study was performed in order to collect information regarding processing labor dependency on fisheries subject to federal fishery management plans (FMPs), which was used to assess how regulation changes affect labor, determine productivity levels, and sources for raw materials required for processing fish and shellfish products. The distribution of labor, gender breakdown, and the level of employment were also examined.

The Mid-Atlantic region includes New York, New Jersey, Maryland, North Carolina, Virginia, and Pennsylvania. Due to lack of reporting policies, Delaware has been omitted. This study comprised a questionnaire that was administered in person and on-site. After determining the difficulties associated with administering a large sample size, using the NOAA Fisheries processed products file, a survey scheme was devised. A 20 percent error relative to employment determined that 44 surveys were necessary to make the evidence statistically significant. After initial difficulties with fishermen refusing to participate for lack of time or other reasons, the sample size was limited to 38.

Based on survey findings, evidence concludes that a growing number of fishermen are relying on foreign and out-of-region suppliers for raw materials. This was also true for herring and mackerel,



two fish in plentiful supply in the region. Numerous plant owners said that they had shifted from processing finfish and shellfish to repackaging and shipping them. Approximately 37 to 50 percent of processors admitted to selling to buyers from out-of-state or foreign markets and 85 percent sold to other processors or wholesalers as opposed to retail outlets, restaurants, and institutions. Between 19 and 50 percent of the 38 surveys administered said they purchased species subject to FMPs. Such species include but are not limited to ocean quahog, haddock, cod, flounder, bluefish, and black sea bass.

Despite the small sample size, 14 unique job categories were identified. Processing and production, 49 percent, was the largest category while quality control, at 10.1 percent, was the next highest category. More the 57 percent of those employed in processing were female. Approximately 51.6 percent of workers were Caucasian.

According to survey results, 81.6 percent of processors believe that processing regulations and fisheries management has directly affected their business. Approximately the same percent felt that land-use policies have not affected their ability to process fish and shellfish. Roughly half of survey respondents felt that environmental restrictions had impacted their business. Interesting, the study finds that many processors are unaware as to whether they are being limited by state or federal regulations. Some processors indicated they had plans to increase the variety of species that come through their facilities and 32 percent said they would remain in the processing business despite hard times.

Belford Fisherman's Survey, Prospects for Revitalization of the Raritan Bay and Sandy Hook, Middletown Resolution and Zoning Ordinance. 1985.

The Survey, conducted in 1984-1985, confirms the long family history many of the fishermen have in the waters in Compton's Creek. Of the 44 fishermen who completed the survey, 13.8 years of age was the average at which people began to fish. Approximately 96 percent responded that they have family members that either were or still are fishermen.

Respondents were asked to report how serious they felt specific problems were at the time of the survey and how they expected this to change in the next 2 to 4 years. More than 50 percent of respondents reported berthing, servicing, and offloading to be of serious concern. For those fishermen that work in clamming, more than 50 percent during both periods reported concerns about problems in clam depuration.

This report provides a detailed overview of general trends and recommendations for the revitalization and expansion of shellfishing the Raritan Bay and Sandy Hook. The report notes that while water quality has improved, sediments remain heavily polluted. Improved sewage treatment has resulted in a decline of bacterial and viral shellfish containment yet seasonal chlorination policies of plant operators have continued to place limitations on harvesting of such species. Such limitations restrict the effectiveness of depuration facilities.

The Raritan Bay and Sandy Hook waters are heavy with metals and toxics. While existing shellfish depuration techniques are able to cleanse coliform bacteria and other viruses, metals and toxics are more difficult. Opportunities lie in the expansion of new depuration technologies and the suspended culture of hard and soft shell clams.



The Middletown resolution indicates the commitment to the protection of the Belford fisheries and the fishing fleet from being displaced. The Future Land Use and Zoning Recommendations for Compton's Creek Harbor outline the measures that should be taken in order to achieve this goal. The study area, Compton's Creek Harbor located approximately one mile from the nearest arterial roadway (State Highway 36), has three streets running through it – Main Street, Port Monmouth Road, and Church Street. The east portion of the study area can only be reached via footbridge or crossing property owned by the Township of Middletown Sewerage Authority.

All existing uses within the study area are dependent on water activities including but not limited to moorings and fish net drying, the Seacoast fish processing plant, and commercial fishing enterprises including the Belford Seafood Cooperative and two retail/wholesale fish markets. Many of the existing residential units are in need of considerable maintenance. The shared use of land makes property boundaries difficult to define. Parcels range from 3,000 square feet to more than 25-acres; approximately 60 percent are less than 2-acres in size. The study area is zoned M-1, a Light Industrial Zone. Here, light manufacturing, warehouses, professional and business offices, and scientific and research laboratories are permitted. This designation came under the 1981 Middletown Master Plan. The area east of Compton's Creek has been zoned for mixed-use development.

The waterfront portion of the study area has been designated an environmentally sensitive area by the 1982 Monmouth County Growth Management Guide. Other portions of the study area have been designated as a proposed protected and industrial use. Growth Guide policies encourage public acquisition of areas along the waterfront, the protection of tidal wetlands, and coastal development compatible with the surrounding built and natural environment.

The study area is located within a 100-year flood hazard area, with the exception of two small parcels on the east side of Compton's Creek. As a result, the study area lies within the jurisdiction of the Coastal Area Facilities Review Act. Land uses that preempt or interfere with port uses and encourage the expansion of existing ports and marine commerce facilities are prohibited under Coastal Resources and Development policies. Development within the wetlands area is therefore limited to require water access or be water-oriented, has no prudent or feasible non-wetland site alternative, results in minimal alteration or impairment of natural tidal circulation, and/or results in minimal alteration or impairment of natural contour and vegetation.

Recommendations for future land use scenarios suggest ways by which to make the best use of a working waterfront for the fishing industry and related commercial marine uses. It is the recommendation that a rezoning ordinance be implemented. Under this, based on its sensitivity, it is the recommendation that the M-1 light industrial area be reevaluated with the possibility of rezoning. The potential to acquire tidal wetlands and salt marshlands as conservation areas should be explored. This has been a growing interest to the Monmouth County Parks System.

Oyster Industry Revitalization Task Force. Report to the Governor and Legislature of the State of New Jersey, 1999.

Since the late 1950's, oyster growth and therefore harvesting in the Delaware River has suffered because of MSX disease. Average annual landings and profits have taken a significant blow as a result. Oystering in the area has continued to decline since that period because of continued disease problems, poor seed bed maintenance paired with a ban on seed imports, lack of innovative production techniques, human health concerns, and an overall depleted supply. In order to address these issues, the New Jersey State legislature passed a joint resolution establishing the "Oyster



Revitalization Task Force.” Members include staff from the Departments of Agriculture and Environmental Protection, representatives of the industry, and researchers from the Haskin Shellfish Laboratory in Port Norris.

Recommendations from the Task Force include mechanisms by which to address each of the above-mentioned reasons the oyster industry in New Jersey has suffered. The report outlines funding requirements and an estimated returned on investment. Using what the report calls a very conservative estimate, proper measures have the potential to result in an additional 130,000 bushels annually totaling 330,000 bushels with a profit of \$4 million.

A Proposal for a New Paradigm for Commercial Fishing in the Raritan and Sandy Hook Estuaries. Kavanaugh, Dennis, Sandy Hook Watermen’s Alliance and Geoff Flimlin, Rutgers Cooperative Extension, 2004.

Statistics reported by the NMFS conclude that the value of total landings in the Port of Belford have fallen drastically over the course of the past decade. In 2001, total landings were valued at \$2.4 million, a decrease of \$4.5 million since 1994. However, the study reports, if proper mechanisms are installed, the feasibility of achieving 1994 levels is high. The study attributes much of the demise of the Port of Belford to the closing of the menhaden fishery and processing plant, and furthers by stating that had this closing not taken place, residential units would not have been built at all.

One of the most significant problems faced by Belford fishermen is that money has become so tight that investment in new vessels is exceedingly and increasingly difficult. While species stocks have increased under state and federal regulations, financial investment, according to Kavanaugh and Flimlin, has become “non-existent” because fishermen cannot make enough money to make necessary repairs or replacements.

There is a plan to install an economic development project in the Belford port on Compton’s Creek. The area between the existing marine facilities and cooperative and new residential units has been slated for redevelopment. This development should be marine-oriented. Additionally, modular buildings that house aquaculture activities, fishery processing or holding businesses, or shellfish purification facilities that support traditional fisheries in Belford have been proposed. Such facilities could benefit from the new residential units in the area.

In previous years, pollution in the area drove many fishermen to abandon some fisheries. As a result, there is little historical data documenting the harvesting of certain species. After many years, these species have rebounded but fishermen are not eligible for entry into recovered fisheries since there is no documentation of historical landings. There are ongoing efforts by existing commercial fishing and shellfishing industries to work with the Utility Authorities and Environmental Organizations.

New opportunities in the Belford port need to present themselves in order for the fishing industry to thrive. The increasing average age of fishermen in the Belford area confirms the very real threat and challenges currently facing the area. Yet, the potential for new opportunities should not be overlooked. The study suggests that opportunities as such should be explored to sustain people of all age cohorts and not solely the species they are harvesting. The fishing industry must be viewed by the State of New Jersey as a viable economic money generating investment not a lost opportunity. A proactive approach to species diversification should be explored. This should come by means of an *Exploratory Fishery Permit*, which would both benefit science and the local economy. This would



allow this historically inventive fishermen's community to continue to be so while abiding by established performance standards.

It is envisioned that either a Rutgers University or other student work with the fishermen to collect data and determine sustainability levels. It is proposed that this program be managed outside of normal DEP regulations. The study lists a number of opportunities that can be explored under such a program including but not limited to an increased availability of crab pot licenses, live fish harvesting through pound or fyke nets and holding tanks for sales of live fish, and expanded fyke net season which would allow an increased harvesting capabilities.

Public Access and Waterfront Development in New Jersey: From Arthur Kill to Shrewsbury River. NY NJ Baykeeper, 2005. McCay, Bonnie, Debbie Mans, Satsuki Takahashi, and Sheri Seminski.

The Baykeeper report provides an overview of the demographic, spatial, and geographic characteristics of Middletown, paying particular attention to the areas abutting the waterfront. Waterfront challenges and planning initiatives have also been identified. The primary concerns pursuant to the waterfront include necessary repairs and other disruptions to the clamming industry, flooding, pollution, and rising housing costs.

The Middletown Master Plan recommends the rezoning of the Belford Seafood Co-op and NY Waterway Ferry area in order to coordinate economic development activities. The Bayshore Development Corporation has been working with the Port Authority of New York and New Jersey to coordinate such activity. A mixed-use development which would include existing commercial fishing and aquaculture activities and an office park have been proposed by the above-mentioned. Furthermore, zoning should permit commercial fishing and related uses, including a clam depuration facility. Uses along outlying areas should be appropriately paired with adjoining parcels to maximize economic potential.

The area is only one along the waterfront specifically for marine use, which is zoned marine commercial. Buildable lot area is 10,000 square feet with a maximum building height of 35 feet. The Planning Board has the authority to reduce the setback requirement to navigable water if it is demonstrated that the use within the building use requires such water access. Provided that they are not for the production of secondary products, such as fish oils, seafood processing is permitted as the primary use. The outdoor storage of fishing related equipment should be permitted as an accessory use. The remaining waterfront areas in Middletown are zoned for high- and medium density single-family dwellings.

There is a Middletown Township ordinance which permits mixed uses that include waterfront oriented activities and public access. Development within this area must complement, both in design and landscape, the existing architecture. Such consideration must be given to vehicular and pedestrian access, parking, and utilities. In order to achieve desirable development patterns, the Township has identified the appropriate percentage distribution of each use within the area.

Bayshore Region Strategic Plan.

The economy in the Bayshore area has suffered due to its isolated geographic location and the overall lack of awareness of cultural, historical, and natural resources in the area. In order to increase



awareness and economic potential of the area, three key economic development issues have been identified:

- *Awareness of the Bayshore Region* – Many tourists and area residents pass through the Bayshore region yet they are unaware of the amenities that these communities hold. It is the recommendation for the Bayshore region to undertake a series of strategies designed to increase awareness. Such techniques to be implemented to achieve this goal include but are not limited to an area assessment of assets, marketing and branding, event sponsorship and coordination, economic and local industry support, retention of fishing and maritime industries, cultural resources, and transportation improvements.
- *Gateway Design Concepts for Key Intersections along Route 36 and the Henry Hudson Trail* – Improvements in gateway design can be used as a tool by which to draw the attention of drivers towards the downtown and waterfront areas. Nine intersections in local Bayshore communities have been proposed for such enhancements.
- *Development of Additional Linkages* – A route should be mapped which permits visitors to travel along local streets and offers access to the waterfront. The proposed “Bayshore Drive” should feature design elements that attract visitors into local communities where they can enjoy the historical, cultural, and natural resources. Pedestrian and bicycle paths along the waterfront should also be included.

Two strategies for implementation have been recommended:

- *Municipalities should collaborate to market and promote the Bayshore area as a desirable tourist destination* – In seeking a cohesive Bayshore identity, municipalities should work both individually and separately to raise awareness of the Bayshore Region. Intergovernmental cooperation is essential for marketing and promoting the area. Specialized task forces will help achieve this goal.
- *The pursuit of potential funding sources* – Funding for the implementation of such strategies should be sought by municipalities in the Bayshore area. Using the appropriate measures, the larger regional collaborative could seek the same. The report lists a number of groups within the area that might have possible funding available.

The report continues by identifying the land use types within the study area, existing zoning, and recommendations for rezoning, and design guidelines to be followed when making infrastructure improvements. Design improvements should be sensitive to the historic character of the area. Additionally, the study recommends municipalities to utilize a variety of New Jersey funded programs such as Main Street New Jersey sponsored by the New Jersey Department of Community Affairs’ or the New Jersey Housing and Mortgage Finance Agency.

There are a number of vacant or underutilized properties throughout the Bayshore area prime for reuse or redevelopment, some of which are former industrial or commercial sites located along the waterfront. The Aeromarine site in Keyport, the Anchor Glass, Freneau, and South River Metal areas in Aberdeen, and the train station area in Matawan are examples of such sites. Reuse and redevelopment efforts should complement and be consistent with other recommendations made throughout the Bayshore Region Strategic Plan. The potential for redevelopment in Keansburg and Highlands is currently under review. Redevelopment efforts should also be consistent with the Plan’s recommendations for economic development and open space. Lastly, a comprehensive plan for the Bradlees and Stone Meadows sites in Hazlet should be consistent with plans for Route 36 and recommendations for waterfront and open space development made in the Bayshore Region Strategic Plan.



A Guide to Developing Aquaculture in New Jersey. New Jersey Department of Agriculture and New Jersey Sea Grant Extension, 2003.

The Aquaculture Development Task Force was established in 1993 as the result of an Executive Order signed by the Governor. Comprised of numerous state government agency representatives, the Task Force was charged with the responsibility to draft the State Aquaculture Development Plan for New Jersey. Technical expertise was also sought from within the fishing industry and academia. The Task Force identified three primary objectives:

- Encourage the development of aquaculture and necessary facilities in a way which protects species and their natural environment;
- Ensure coordination and cooperation between and among state agencies with jurisdiction over aquaculture and related activities; and
- Address issues related to product standards, marketing research and demonstration, and training and outreach.

The New Jersey Aquaculture Development Act was passed in 1997 as a direct result of the efforts and recommendations put forth by the Task Force. The Guide to Developing Aquaculture in New Jersey outlines how to complete an application for an aquatic farm license, answers permitting questions, reviews agricultural policies specific to New Jersey, aquaculture development and the financial commitment necessary and means by which to borrow funds to establish such facilities.

Spy House Harbor. Beyer Blinder Belle, 1989. Seaport Associates.

Spy House Harbor is a new waterfront village located in the Bayshore Development area. Development patterns in the area feature mixed-uses with an emphasis on water activities and access. The village encompasses approximately 225-acres and hosts a boardwalk, yacht club, and a marina. Architectural styles that complement traditional New Jersey waterfront homes will be utilized. Landscaping and plantings will follow established design patterns.

Bayshore Technology Center Proposed Commercial Fishing and Aquaculture Project Feasibility Analysis. The Port Authority of New York and New Jersey. 2003.

This analysis proposes three possible redevelopment scenarios for the area. The purpose of the study, however, is to examine and evaluate potential ways to implement the third option (the final bullet below) without negatively impacting other area projects.

- The site will be used to accommodate suburban growth patterns. However, this option is not desired as it will result in the loss of shellfish production in the area. Such a loss will decrease the diversity of uses currently demonstrated in the area.
- Create a dynamic community that is sensitive and welcoming of a mixed-use community that would support both the growth of residential development and the continuation of fishing activities, including the opening of a restaurant. The appropriate balance between the two is essential to maintain the economic vitality of fishing activities. If not executed properly, the site has the potential to be converted into the above-mentioned.
- Develop the site to sustain a diverse and flexible mix of uses. This could include both land- and marine-based activities including land-based aquaculture to reduce the strain on the natural habitat. The site should use its scenic waterfront access as a means by which to attract increasing numbers of ferry riders and waterfront related uses including commercial, retail, and residential.



Aquaculture Marketing Survey – Consumers, Retail Stores and Food Service in New York and New Jersey. New Jersey Department of Agriculture and the Northeast Regional Aquaculture Center, 2006. Gall, Ken and Linda O’Dierno.

Trends show that fish and shellfish are the least consumed animal proteins across the United States. Studies find that much of this can be attributed to high costs and peoples lack of knowledge of proper preparation of seafood products. However, evidence shows that seafood consumption in the Northeast is higher than elsewhere across the county.

Existing challenges faced in the seafood industry include an increasing market share for seafood relative to other animal proteins, recapturing the market for seafood products that have been displaced by cheaper imports, and expanding the export market share. Studies show that few people in the marketplace are aware of the difference between aquacultured and cultured products. Many aquacultured or farm-raised products are not labeled as such in the marketplace and sold alongside wild-caught species. The survey concludes that a major educational campaign needs to be launched in order increase awareness. Yet, according to the United States Department of Agriculture, aquaculture is the fastest growing agricultural industry in the country. In 1993, aquacultured seafood accounted for approximately 16 percent of the fish and shellfish consumed in the United States, most of which is imported.

A consumer survey was conducted at a number of public events in both New York and New Jersey during 1993. Additional data was supplemented by two focus groups, one in each state. The survey sought to examine how often, what types, and where people ate seafood products. Income levels, age characteristics, reasons why they ate seafood products, factors that dictate purchasing decisions and perceptions about aquaculture products were also reviewed. Survey results indicate the following:

- Overall, consumers are not widely aware as to whether or not the products they purchase are aquaculture or farm-raised;
- Taste and nutrition are two of the driving factors that dictate the purchase of seafood products;
- Freshness is the most important factor;
- Aquaculturists should be aware that many consumers want products that are easy to prepare. For example, fillets and steaks that are easy for any type of cooking, recipes should also be included. The consideration for prepared foods such as soup and frozen fish should be explored;
- Pricing strategies should be designed that address the concerns faced by consumers when purchasing seafood products;
- As a consumer concern, the source of seafood products and seafood safety should be considered when refining production techniques and when developing marketing strategies; and
- Given the varying markets types, retailers should evaluate the markets to which they sell products. Such an evaluation can help determine the different needs of particular markets and in the development of marketing strategies.

The retail market survey was performed to develop a profile of seafood species, sales, attitudes, and the marketing needs of retail stores in New York and New Jersey. The survey was designed to gather data that would help gain a stronger understanding of the types of seafood products available at the retail level, to identify the mechanisms and tools needed for aquaculture fisheries to increase their overall share in the market place, and to determine which potential retail markets may exist for value-added products.



Surveys were completed by 497 retailers in New York and New Jersey, of which 350 were completed by seafood departments in 12 supermarket chains and 147 were completed by independent retail seafood or fish markets. Approximately three-quarters of businesses were located in an urban environment while 19 percent were in suburban and the remaining 6 percent in either a rural setting or vacation spot. Survey questions included but were not limited to annual profits, species sold, a clientele income profile, ratio of fresh, frozen, and ready-to-eat products, harvesting location, and display of nutritional information. Survey results have led to a number of recommendations for marketing opportunities. Such recommendations include:

- Increase the number of and improve the quality of educational and promotional campaigns that target retail seafood counter personnel and store operators. Such programs should include elements of quality control and environmental benefits of farm-raised products, and safety, price, and supply advantages that such products can provide to retailers;
- An increased awareness of which products are farm-raised versus aquaculture produced. Labeling and similar techniques can be used to increase sales;
- The local independent market should be a target for smaller aquaculture producers;
- Aquaculture products must have a reasonable and stable price structure for consumption to increase at a constant pace;
- Aquaculture producers should consider the market types to which they are distributing goods. For example, some markets sell more fresh products while others sell more frozen and ready-to-eat products;
- Producers should be aware that retailers in suburban markets tend to purchase products on a more frequent basis;
- Aquaculture producers who further process foods or offer value added products should consider the needs and preferences of retailers;
- Blind taste tests could be performed as a means by which to diminish perceptions of aquaculture fish having less flavor;
- Promotional materials should be distributed to increase product recognition; and
- Consideration should be given to develop consumer education programs to increase awareness about aquaculture and products available.

Studies find that many Americans feel more comfortable eating seafood in restaurants than they do preparing it at home. On an annual basis, almost twice as much is spent purchasing seafood products in restaurants than in stores for in home preparation. As a result of these statistics, aquaculture producers must be aware of restaurant needs and then develop marketing strategies accordingly.

The final section of the report examines the fishing industry and its role and potential in the restaurant and food service industry. The survey sought to identify the products and product forms that are the most desired by restaurants in New York and New Jersey, the supply sources utilized by food service businesses, understand the attitudes and perceptions of aquaculture products in the food service industry, and identify the types of products – either value-added or prepared – that would be suitable for such businesses. Of the 2,000 surveys that were distributed, only 5 percent or 100 surveys were returned. Similar questions to those mentioned previously in the consumer and retail store surveys were also asked of those in the food service industry. Using survey responses, the report recommends the following opportunities to increase marketing in the food service industry:

- Survey respondents indicated that they were not aware which of the products they served were aquaculture products. Better labeling and an increase in educational activities that target service operators and wait staff would help strengthen the identity of such products in the food service marketplace;



- When developing marketing strategies, aquaculture producers should consider where food service businesses purchase seafood products. Producers should also consider the types of establishments and institutions purchasing their products as they have varying needs, e.g. Frozen, fresh, value-added, etc. This will also help determine portion size;
- Since many reported that they were unaware as to whether or not they had purchases aquaculture products, producers could stand to benefit from a more in-depth analysis to determine what types of establishments and institutions are purchasing such products. This has the potential to also help identify why such establishments do not purchase aquaculture products or whether people are simply unaware that they are in fact aquaculture products;
- Product safety is viewed as a one of the biggest advantages of aquaculture products. Better labeling and educational programs should be used as a key marketing strategy;
- Blind taste tests should be considered to address the consumers concern about taste; and
- The sale of prepared items that are portion controlled should be incorporated into the marketing strategy.



Summary of Stakeholder Information by Topic

There are a number of reoccurring themes that presented themselves throughout the interview process. The information outlined below provides an overview of the main themes, concerns, and/or advantages for the various development options poses for the Port of Belford as presented through a series of stakeholder interviews.

Clam Depuration Plant

- There is already a lot of competition in a limited market. When volumes increase, the price gets driven down.
- Depuration is a rather expensive process, and it is unclear if there is available money for subsidies.
- Depuration is more of a strategy fishermen believe will make money when in reality it typically does not.
- Depuration could work if people are willing to work that hard.
- In Belford, for depuration to be successful, the government would need to provide them with facilities and subsidize power.
- Depuration generally works in areas where someone controls water quality.
- The location of the shellfish is important too because 100-200 yards away from one site is water clean enough to take the shellfish directly to market. By depurating all shellfish you are then adding unnecessary costs.
- Depuration is believed to be a “magic bullet.” He has received many calls from people who are going to build depuration plants and make “gazillions,” when in reality they don’t make money.
- The Department of Health should identify whether or not a depuration facility in Belford is doable to build a plant.
- There are a lot of concerns within the region regarding the Port of Belford opening up a depuration plant. Many harvesters and plant operators believe that it may flood the existing market and drop the prices. This would significantly undercut the existing industry in the region since there is tight competition with producers in the South. She also stated that generally NJ depurated clams are seen as lesser value due the smaller size.
- Permitting for any of the facilities associated with the development alternatives would require dealing with Department of Health directly. Overall, DEP has the most stringent regulations pertaining to these facilities. Permitting in Belford is feasible however, depuration is complex and requires two permitting processes – design and operation.
- The Port of Belford poses numerous challenges for clam depuration plant. The certification of plant will require tax books to be transparent. The shellfish have to be counted which is not how existing practice is carried out in Belford. This will pose challenges on existing fishing industry at Port.



- DEP's main responsibility regarding a depuration plant is the classification of water, transportation to depuration plant, and oversight of enforcement for harvesting activities in the water. Regarding aquaculture, the Department's responsibilities also focus on intake and discharge of water and regulations regarding traditional on-bottom aquaculture. Both of these would require a water quality permit from the Department of Water Quality.
- Water for a depuration plant cannot be taken from prohibited waters. Water would have to come from outside of the creek and west of the end of the breakwater. This would not be required for a live fish holding facility.
- Chowder clams can be used as a product for the down times in Belford. He thinks the co-op could own the depuration plant. The plant wouldn't need to make money because the fishermen would be the owners and they were already getting paid for their clams.

Aquaculture

- There is no marine finfish culture occurring in NJ partly because there is no finfish culture expert, so there hasn't really been much finfish aquaculture research or development. There are also regulatory obstacles if native fish species were to be grown-possession of undersize fish. There has been recent aquaculture in Southern Jersey raising Koi – decorative tanks. There are opportunities for aquaculture for bait fish.
- Water issues are the main concern for aquaculture in NJ. For Belford, water from the Bay could be used but would have to filter with municipal water as backup. Municipal water can be used for freshwater aquaculture farms if it is dechlorinated.
- Aquaculture does provide a steady base of production. Even when times are bad you still have an income.
- Aquaculture is growing everyday with new species being introduced frequently. This is important because natural fisheries are being fished at capacity.
- Live fish in aquaculture is a problem because they need to have fish permits to catch fish below 12 inches. Permits cost \$40,000 to \$50,000.

Live Fishing Option

- A live holding facility is a real possibility for Belford. There is big opportunity in the live fish trade, especially live black sea bass; the Canadians in Toronto are always looking for that. It's a very lucrative market.
- There is a lot of shrinkage in the live fish market due to transportation. While the methods have been worked out, they are not being practiced--fish are often packed into overcrowded barrels on trucks without oxygenation, resulting in their arrival in poorer condition.
- Due to the growth in the market, the live fish option as the most profitable.



- The live-fish option is strongest when it is within close proximity to the entities served – not as much competition with imports. Recommends that investment in the live-fish option (especially for Sea Change) is best with developers and producers that are already established.
- The prices are fantastic for live fish. They get \$3 -\$4 per pound for blackfish. At those prices, the guys would only need to catch 100 pounds. This clearly has an environmental advantage.
- Right now there aren't very many boats that catch the fish alive, but if there was a market there would be many more.
- He is very enthusiastic about a live fish market at Belford; however, he doesn't know if there is a market for it.
- A live fish market might be the opportunity many of these guys are waiting for to get back into pound fishing. The problem for pound fishermen is the access to poles and a place to dry their nets.
- They have been selling live fish for 12 years, and these are the same species that have continued to sell well over time. They are trying to introduce other types of live fish. They sell a variety of frozen fish but do not have a live supply of them.
- They would like to buy local NJ seafood instead of buying from New York City. Most of the live fish comes from suppliers in Brooklyn.
- Approximately 15 percent or more of their live fish purchases die before being sold, with no particularly evident cause. For example, in the Middletown store, they buy 200 pounds of live fish per week and about 30 to 40 pounds of it die and must be sold as frozen, which is pretty much at cost. Their stores receive shipments of these fish, as they do not have trucks with aerators and tanks required for shipping.
- It is difficult to know if there is a live fish market for the species currently being brought into the Belford port.
- Ethnic tastes are relatively broad when it comes to seafood, and live is the preferred form. It may take some initial effort to stimulate the market for a given species, but the potential exists if the supply, logistics and price are relatively stable.
- General requirements for a live fish facility include a good quality water source, sufficient tanks and associated facilities such as water treatment, good biosecurity practices to minimize problems with the generally crowded physical environment, and management that knows what it is doing with regard to water quality and maintaining fish health. Google "live fish holding systems" for additional information. There are companies like Marine Biotech that design and install holding systems for fish and shellfish
- He does not think that any of the fishing related development options for the site are economically feasible without some type of government subsidy. The Live Fish is the only option that seems feasible economically but this may be too expensive. Preserving the entire site as open space may be the best option since there is very little land like this that the local and State government could use.



Open Space

- Recommend getting Green Acres funding and turning part of the area into park.
- There are two main methods of conservation that Green Acres could apply to the study area: acquisition of a portion of the study area at full market value (determined according to current zoning) or redevelopment process and application a conservation easement.
- If a conservation easement was granted at the co-op, much needed financial resources would be at their disposal and discretion. Even if a conversation easement was granted, Green Acres has no intension of interfering with the present operations of the co-op.
- The land along the Creek and Bay are of highest value to Green Acres. They would also want sufficient buffers from adjacent uses. They do not have requirements on the size of property. They would be open to acquiring the entire property to a portion as small as 1.5 acres.
- Due to the environmental value and recreation potential, Green Acres would like to see the 9-acre parcel with more preservation than development. They are interested in securing a public access component for recreational fisherman. The State Acquisition program would like to add to the existing parks along the Bay and Creeks.
- If part of the property were to be preserved, Green Acres would be able to provide the funding for outdoor improvements such as an environmental structure or ancillary facility.
- If a path or boardwalk along Bay and/or Creek were provided, Green Acres may be able to provide funding for bulkhead repair (Keyport Example).

Commercial Development

- The coop should take seriously its prime location and the fresh seafood market; needs to do a better job handling the seafood, presenting it and presenting the personnel there, and also advertising.
- Residents of the Dunes do not believe that retail is a smart investment. There simply is not enough presence in the area to make retail a viable option.

Educational Component

- Important to use the space in a way that emphasizes to visitors that they are looking at a living, working port.
- If you can incorporate traditional uses with the educational space you could provide a very exciting learning experience.
- Consider a “Save Belford Group.” This would be an organization that grows from volunteers to professionals. It is a touchy thing to develop successfully because if you hire a professional you lose the community. Volunteers need to be recruited from within the community, but that would require active support from the co-op.



- There is considerable potential to receive Green Acres funds for an educational facility (Tuckerton Seaport).

Ferry Terminal

- There are plans to expand the ferry slips to 4 slips. Currently, there are 2 ½ slips. There is an RFP out for secondary ferry service to provide additional service to ballgames, airports, etc. There is not enough parking to provide another operator during the week. The settlement on the lot prevents them from building structured parking.
- The County is going through an assessment of expanding the building but the results show that this is not necessary since most people stand outside waiting for ferry.
- The best area for parking expansion is behind the main lot, but this area is slated for an interpretive center - Baymen Education Center, as part of the mitigation in the permit (for wetland impacts from the existing lot). The county only has to construct the interpretive facility if federal funding is available, which to date, it has not been. There is a designated site for this center but Federal funding has not become available and therefore they are not required to build it. A research center is also proposed in the original permit drawings but there has been no interest in developing and maintaining this. They have reached out to numerous universities and colleges.
- He is open to working with the County to have a tent or booth selling local seafood or prepared meals next to ferry terminal building. As the riders are walking to their cars they could stop and shop. This would most likely not work in the terminal because riders do not exit through terminal. He does not see a problem with the tent or booth. They could start by trying it out a couple times a week. He sees this as potentially being a success.

Bulkhead/Dredging

- Since 2002, the County has had two dredging contracts and completed dredging of the outer harbor. They also did some spot-dredging in the inner channel, in front of the co-op, to get that entire area to -6 feet. All of this dredging was done with federal funds. The County will not be conducting any additional dredging and not responsible for any additional dredging. The channel is a Federal channel so Army Corp. is responsible for keeping it navigable. They dredge it every 6 to 8 years and the last time dredged was 1996.
- The County would like to see the channel widened from 75 feet to 200 feet. They would also like to see the bulkhead expanded. This is the responsibility of the Army Corp. They have contacted the Division of Coastal Resources to get them to sponsor a study by the Army Corp regarding the widening, deepening, and repair of bulkhead.
- The county says that NJ Coastal Resources should sponsor a widening and deepening of the channel. The bulkhead on the front side of the co-op was rebuilt by the Port Authority in the early 1990's. The county responded to allegations that the ferries had damaged the bulkhead along the corner and north side of the co-op property by conducting an examination of the bulkhead. Birdsall engineering did that study, and found that the bulkhead was failing due to age, and not by waves etc. generated by ferry traffic. The study found that the sheeting was deteriorated due to the age and is not because of the ferry. Since the bulkhead is owned by private landowners it is their responsibility.



The Port Authority repaired the bulkhead along the inner harbor in mid 1990s. There may be available funding through them for repairing this. The County does not see it as their responsibility.



Stakeholder Interview List

Alexander, Cali. NJ Department of Health and Senior Services Shellfish and Seafood Project, Interview conducted on April 4, 2007.

Best, Bob and Jack Baker. Shoal Harbor Lobster Company. Interview conducted on March 11th, 2007.

Bogan, Ray. Attorney representing Party Boats. Interview conducted on May 11, 2007.

Mr. Chan, Asian Food Market, Locations throughout New Jersey and the Northeast. Interview conducted on May 2, 2007.

Charley, Jeff and Bob Yahara. Independent Fishermen. Interview conducted on March 11th, 2007.

Compton. Brian. J. Crawford Compton, Inc (Real Estate). Member of the Northern Monmouth Chamber of Commerce. Interview conducted May 11, 2007.

Connell, Bob and Debbie Watkins, NJDEP Bureau of Marine Water Monitoring, Interview conducted April 23, 2007.

Davis, Gary. NY Waterways. Interview conducted on May 10, 2007.

Diehl, Roy, Joe Branin, and Rich Isaaksen. Belford Seafood Co-op. Interview conducted May 21, 2007.

Dixon. Bill. Department of Environmental Protection. Interview conducted on May 30, 2007.

Drummond, Shelly. Director of Programs, Tuckerton Seaport, Interview conducted April 19, 2007.

Elliott, Matthew. Conservation Director, Sea Change Investment Fund. Interview conducted on April 6, 2007.

Ettore, Joseph - Monmouth County, County Engineer; Sayed Moafi - Monmouth County, Chief Environmental Engineer; and Joe Barris - Monmouth County Planning Board, Long Range Planning. Interview conducted April 11, 2007.

Ewart, John. Aquaculture & Fisheries Specialist, Delaware Sea Grant Marine Advisory Program. Interview conducted May 29, 2007.

Flimlin, Gef. Belford Seafood Co-op. Interview conducted February 21, 2007.

Gabrysiak, John, Steve Heller, and Ed Petrosky, Residents of The Dunes at Shoal Harbor. Interview conducted on May 1, 2007.

Hahn, Faith. Acquisition and Design Department, Monmouth County Park System. Interview conducted on May 3.

Hoff, Dr. Thomas. Scientist with the Mid-Atlantic Fishery Management Council in Dover, Delaware. Interview conducted May 7, 2007.



Hutnick, Jay. Port Authority of New York and New Jersey, Project Management Division. Interview conducted May 11, 2007.

Jacobsen, Tim. Cumberland County College, Interview conducted on April 23, 2007.

Joseph, Jim. Chief of Shell Fisheries and Mike Celestino, NJDEP Bureau of Shell Fisheries, Interview conducted April 23, 2007.

Kastning, William. New Jersey Department of Environmental Protection Green Acres program. Interview conducted May 25, 2007.

Kavanough, Dennis. President, Sandy Hook Waterman's Alliance. Interview conducted November 20, 2006.

Myers, Joe. Aquaculture Specialist, NJ Department of Agriculture. Interview conducted on April 3, 2007.

O'Connor, Terry. Monmouth County Administrator Responsible for Ferry Terminal. Interview conducted May 9, 2007.

O'Dierno, Linda. Coordinator, Fish and Seafood Development Program Department of Agriculture. Interview conducted on March 26, 2007.

Pulsch, Robert. Interview conducted on May 11, 2007.

Schnoor, Jr., Tommy. Belford Seafood Cooperative. Interview conducted May 22, 2007.

Somerset, Ira. Regional Shellfish Specialist, U.S. FDA. Interview conducted on March 27, 2007.

Somerset, Ira. Regional Shellfish Specialist, U.S. FDA. Interview conducted on March 27, 2007.

Taberian, Edward. Foreman, Monmouth County Bayshore Outfall Authority. Interviewed conducted on April 5, 2007.

Young, Ink. Engineer, Monmouth County. Interview conducted June 4, 2007.

High Hydrostatic Pressure Processing (HPP) Demonstration, Rutgers University. February 21, 2007.

International Boston Seafood Show. Informal interviews at the Exposition. March 11th-13th, 2007.

Barrett, Terry. National Sales Manager, AmeriPure Oysters, Franklin, LA.

Garza, Stephen. President, C Farms LLC and White Water International, Inc., Miami Lakes, FL.

Rasmussen, Tom. Distribution Manager, Cherrystone Aqua Farms, Cheriton, VA.

Schnoor, Jason. Sales Manager, Certified Clam, Highlands, NJ.

Zeller, Bill. President, Captree Clam, West Babylon, NY.



Wellfleet Shellfish Company, South Wellfleet, MA AND Aquacultural Research Corp.

Gold Band Clams and Wine Island Stuffed Oysters

Rick Spalding, Fishery Products International and Away from Home Marketing

Presentations at the International Boston Seafood Show

Selling Successfully to Big Buyers – International Boston Seafood Show

Speakers: Terry Harriman – Seafood Category Manager, Hannaford Bros. Co., Christa Ingalls – Seafood Commodity Manager, Avendra LLC, Todd Post, President, Seafood-1 Inc.

Leveraging Sustainable Aquaculture in a Cost Driven Industry– International Boston Seafood Show

Speakers: Sally Eason – Owner, Sunburst Trout Company, Matthew Elliott – Conservation Director, Sea Change Management LLC, Mike Mitchell – Technical Controller, Young’s Bluecrest Seafood Limited, and Peter Redmond – Vice President of Seafood and Deli, Wal-Mart.
Mitchell, Mike. Young’s Bluecrest Seafood Limited