

# **JOB SATISFACTION, WELL-BEING AND CHANGE IN SOUTHERN NEW ENGLAND FISHING COMMUNITIES**

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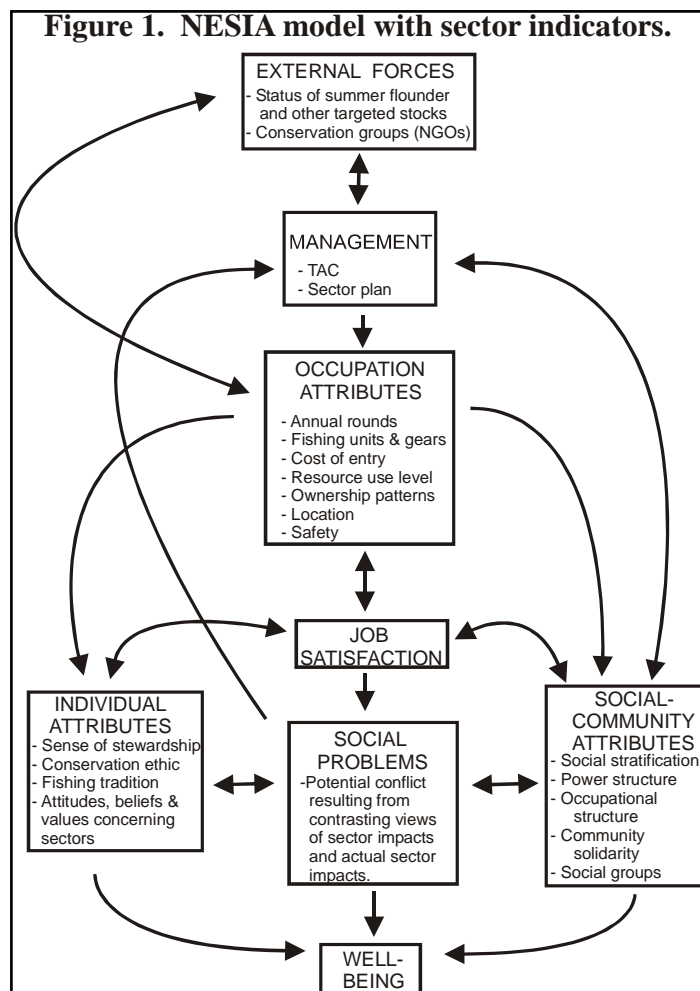
<sup>3</sup>*Participated in data collection, both surveys and qualitative interviews. Coded qualitative interviews.*

# JOB SATISFACTION, WELL-BEING AND CHANGE IN SOUTHERN NEW ENGLAND FISHING COMMUNITIES

## 1. INTRODUCTION & RESEARCH METHODS

**Introduction** This report is directed at examining interrelationships between well-being of Rhode Island’s commercial fishermen and fishery resource management and change. Rhode Island’s commercial fishermen have been facing a number of changes in the fishery which can impact their well-being. The Fishery Conservation and Management Act of 1976 brought joy to the hearts of Rhode Island fishermen who had been seeing the large European factory trawlers sweeping the offshore waters, some said to the detriment of our own fishermen. After passage the fishery expanded, but so did the rules regulating the

fishery. Before long harvests began declining—some declines the result of over fishing, natural cycles in stock sizes, disease, an oil spill, and some the result of the multiplication of state and federal regulations limiting where and when they can fish and how much they can catch to foster the rebuilding of fish stocks. Fishermen began complaining about the rapidly multiplying, complex and ever changing regulations, saying that they were ruining the fishing communities and their way of life.



In order to objectively examine the impacts of management on the well-being of Rhode Island’s commercial fishermen we use a recently developed model of non-economic social impact assessment (NESIA) developed by Pollnac and his colleagues (Pollnac, et al. 2008). An example of the use of this model to frame research to ask questions concerning impacts of fishery management on well-being in Rhode Island is presented as an introduction and background to the research presented in other sections of this report. It must be stressed that the fluke sector example is only presented as an example of the application of the model. We do not focus on sectors in this report.

The recently (2009) implemented fluke sector is used to illustrate how the model will be employed to frame research questions in our research. This example will be superficial in the sense that it is merely selecting examples of the process to indicate how such a model will be applied in the research presented here.

Figure 1 illustrates application of the NESIA model to frame research questions to understand potential impacts of a specific type of management initiative, sector management of the fluke fishery in Rhode Island. We will be examining impacts of many aspects of management in this report, but sectors, currently a contentious issue in the Rhode Island fishery are used as a very current example of the use of the NESIA model in framing research questions (or hypotheses). Figure 1 is based on a heuristic model which illustrates the relationship between the categories of variables important for understanding the interrelationships between fishery management and its social impacts, including impacts on well-being. In the description of the application of the model below, italicized concepts indicate categories in the model, and arrows indicate influence of one category on another. For example, *external forces* influence *management* and vice versa.

With regard to *external forces*, the status of summer flounder and other targeted species led to pressure from conservation groups and NOAA Fisheries to manage the fishery (*management*). Summer flounder (fluke (*Paralichthys dentatus*)) is among the groundfish being managed in the waters off Rhode Island. In contrast to other groundfish, Rhode Island's total allowable catch (TAC) of fluke is managed by the state. The TAC is divided into 3 seasons with daily possession limits, some days closed, and the season closed when the TAC is reached. Fluke caught exceeding the daily possession limit or when the season is closed are discarded.

In terms of *occupation attributes*, fluke are hard to avoid since they are mixed with other targeted groundfish; hence, significant amounts are discarded—an action abhorrent to beliefs concerning appropriate, traditional fishing behavior; hence, probably reducing fishermen's *job satisfaction*. Fishermen's attempts to avoid fluke influenced where and when they would fish (annual rounds and location) and possibly their safety by causing fishermen to go to sea in questionable weather to try to catch fluke when the TAC was approaching depletion.

These *occupation attributes*, which were changed by the TAC, probably influenced levels of *job satisfaction* and conflicted with *individual attributes* such as tradition of fishing and conservation ethic (discarding fluke that would die and not be used for human food). The conflict with *individual attributes* further decreased levels of *job satisfaction* influencing some fishermen to form a group of like thinking individuals to attempt to influence changes in management—a new social group, which forms part of the *social-community attributes* section of the NESIA model.

This new group of eight fishing boats was the Rhode Island Fluke Conservation Cooperative (RIFCC). The group devised a plan to manage itself as an IFQ and developed a proposal for a sector allocation (*management*) which was approved March 2009 and began operations in April of the same year as a pilot program by the Director of the RI Department of

Environmental Management (RIDEM). Now we cycle through the NESIA model again from *management* to *well-being* looking at potential impacts of the newly implemented management scheme.

The RIFCC was allocated a share of the Rhode Island fluke allocation, which they could harvest year round, not being constrained by the seasonal TACs applied to non- RIFCC member vessels (*management*). In exchange for this right they had to follow a set of member agreed upon rules (*management*) which: 1) regulated their fishing grounds (area within which they could fish for or use gear that could catch fluke); 2) required retention of all legal sized fluke with undersized discards counting against sector quota; 3) had to complete detailed forms for RIDEM regarding fluke landings and discards (data available to public), as well as notify RIDEM at least 1 hour of landing any fish in Rhode Island; 4) bear responsibility for costs incurred through trip monitoring and observation (e.g., onboard observers); and 5) use a specialized gear (dropped chain net design) in the small mesh fishery as a fluke excluder device.

These rules, of course, obviously influenced many of the *occupation attributes* noted in figure 1, which in turn influenced levels of job satisfaction when mediated by various *individual attributes*. For example, different fishermen have beliefs concerning an idealized “way to fish” or fishing tradition. For many in the sector this included a conservation ethic which was violated by throwing back good food fish which would then die (regulatory discards), a desire to fish year-round for groundfish unconstrained by the state imposed TACs and fish in a manner that would allow them to take only short trips—day trips if possible to be home with their families more. Some have also hypothesized that “ownership” would result in greater stewardship on the part of the fishers. All this gave RIFCC members an enhanced level of *job satisfaction*. Ability to fish for fluke when other fishers could not also improved the market value of fluke for RIFCC members, possibly influencing social stratification based on income in the fishing community (*social-community attributes*).

Of course, many non- RIFCC members (both commercial and recreational fishermen) had strong negative perceptions concerning the *occupation attributes* associated with members, fearing that sector allocations would detract from their access to the resource and ability to fish the way they wished (*occupation attributes*), influencing perceived impacts on *job satisfaction*, and resistance to sector management. This negative perception of sector management was manifested in the community by verbal conflict (*social problems*) and polarization of the community into different social groups (pro-sector and anti-sector groupings—*social-community attributes*). Activities of the anti-sector groups, not only in Rhode Island, but throughout New England, resulted in subsequent attempts to reverse NOAA Fisheries’ plans to implement sector management (*management*) in the groundfish fishery. These anti-sector sentiments were expressed at public meetings, on web sites and with lawsuits, most of which are documented at the web site SavingSeafood.org. The pro- and anti-sector groupings have leaders (power structure, *a social-community attribute*) and activities of the groups may lessen the social solidarity of the fishing community (*social-community attributes*)—illustrating the fact that variables within the major categories are

also interrelated. All these changes, of course, are proposed to have differential potential impacts on *well-being*.

**Research Questions** As can be seen in the brief discussion above, use of the NESIA model can generate many research questions. The brief discussion was based on information that could easily be obtained in the mass media (including web sites), attendance at fishermen's meetings, and discussions with group leaders. Some information gathered in this manner is relatively straight forward and reliable. But some of the information begs several questions, 1) What is the reliability of these readily available sources? and 2) What are the distributions of these impacts throughout the fishing communities in the research area? These questions can only be answered with the use of triangulated key informant interviews in combination with survey research.

Although our general research question involves the applicability of the NESIA model to understanding management's impacts on well-being, we have selected several very specific research questions as well. These specific questions will provide a strong test of elements of the model.

- *First*, how has the implementation of management impacted perceptions of the management system?
- *Second*, how has management impacted elements of job satisfaction? Our specific hypotheses concerning job satisfaction are the following: 1) regulations which negatively influence occupational attributes such as income and time and areas fished will reduce job satisfaction in terms of basic and social-psychological needs. 2) Management will have little if any impact on satisfaction on the self-actualization component (Pollnac & Poggie 2008; Pollnac, et al. 2011).
- And *third*, how are elements of job satisfaction and attitudes towards management interrelated to each other and to the fishermen's sense of well-being? The specific hypothesis associated with this research question is that individual well-being will be positively correlated with levels of job satisfaction.

**General Research Methods** Three general research methods were used: 1) literature review; 2) open-ended key informant interviews and 3) survey, including both current and archived survey data. The literature review was conducted to provide a brief sketch of the recent background of the fishery in Rhode Island. The key informant interviews were conducted to determine the perceptions of the impacts of management on the lives of fishermen in Rhode Island over the past several decades. And the survey was conducted to provide qualitative and quantitative data to supplement the background material as well as test the three specific research questions derived from the NESIA model. Together, the background material (literature review & key informant interviews) and the results of the survey will provide a test of the applicability of the NESIA model. The sample is a representative sample of 138 Rhode Island fishermen.

**Measurement of variables** The survey form used (Appendix I) provides the operational definitions of variables examined. Most of the questions are relatively straight forward, but several of the categories will be more fully described in this part of the report.

*Job satisfaction* is a complex variable first used by Pollnac & Poggie in 1977 (Acheson et al., 1980; Pollnac & Poggie, 1988) and then by them and many others in the US and Canadian fisheries over the following years (e.g., Pollnac, et al. 2008; Pollnac and Poggie, 2008, 2006, 1988, 1980; Gatewood and McCay, 1990; Binkley, 1995; Apostle et al., 1985). Since then the job satisfaction variable has been used in several fisheries outside the US and Canada (Pollnac, et al. 2011, Monnereau, et al. 2010). All these studies indicate relative stability in the structure of the job satisfaction variables (the 3 components derived from the 22 indicators used in most of the cited studies); hence, Pollnac (2011) analyzed data collected in surveys in New England, Alaska and the Dominican Republic using a standard list of 22 job satisfaction indicators and derived 3 principal components reflecting findings very similar to most analyses done with this list of attributes (table 1.1). Since 22 indicators is a relatively large number, and since the structure of job satisfaction had remained markedly similar across numerous analyses (Binkley, 1995), Pollnac (2010, 2011) reduced the number of indicators for each component to the 3 that manifested the highest loadings on each component.

**Table 1.1 Principal component analysis of job satisfaction items**

	<b>Social &amp; Psycho Needs</b>	<b>Self Actualize</b>	<b>Basic Needs</b>
Time away from home	<b>0.703</b>	0.051	-0.020
Physical fatigue of the job	<b>0.646</b>	0.152	0.042
Healthfulness of job	<b>0.644</b>	0.147	-0.084
Hours spent working	0.644	0.152	0.346
Time for recreation & family	0.569	-0.032	0.189
Mental pressure of job	0.496	-0.179	0.358
Time to the fishing grounds	0.496	0.110	0.253
Adventure of the job	0.097	<b>0.816</b>	-0.018
Challenge of the job	0.158	<b>0.730</b>	-0.061
Opportunity to be own boss	0.000	<b>0.631</b>	0.079
Being on the water	0.113	0.628	0.048
Doing something worthwhile	0.088	0.611	0.354
Your actual earnings	0.153	0.082	<b>0.785</b>
Predictability of earnings	0.254	-0.120	<b>0.782</b>
Job Safety	0.036	0.308	<b>0.514</b>
Cleanliness of job	0.373	0.100	0.156
Community in which you live	0.124	0.110	0.120
<b>Percent of Total Variance</b>	<b>16.801</b>	<b>15.398</b>	<b>11.919</b>
<b>R<sup>2</sup> of top 3 with factor score</b>	<b>0.79</b>	<b>0.86</b>	<b>0.86</b>

Multiple correlations between these top 3 and the factor scores for each component were high enough to accept the three as reliable representatives of each component (table 1.1). The 9 items used are questions 1 through 9 in the job satisfaction section of the survey form (Appendix I). Questions 1, 3 and 4 represent the Basic Needs component; questions 5, 7 and 8 the *Self Actualization* component; and questions 2, 6 and 9 the *Social-psychological* component. Two other job satisfaction questions, questions 10a and 11a, (would you advise a young person to go into fishing and would you still fish if you had your life to live over), which were previously used by Pollnac and others, are also used as indicators of job satisfaction.

*Well-being* Analyses conducted by Pollnac (2010) similar to those described for job satisfaction were used to select the 4 questions used to evaluate individual and environmental well-being (questions 12 – 15 in the well being section of the survey form

found in Appendix I). Other analyses (see Oswald & Wu 2010) have presented objective confirmation of responses to the subjective measure “In general, how satisfied are you with your life (question 13 in the well-being section of the survey form, Appendix I) providing further validation for our use of this question. The environmental well being measure is based on the single question “How satisfied are you with the overall health of the marine environment?” scaled from 1 to 5, very dissatisfied to very satisfied. The individual well-being measure is an indicator formed from the summing of the other 3 well being measures (How satisfied are you with your life, How satisfied are you with your physical health, and How often do you feel really happy?) resulting in a scale ranging from 3 to 15.

## 2. EFFECTS OF REGULATIONS ON THE RHODE ISLAND FISHING INDUSTRY THROUGH TIME – THE PARTICIPANT’S PERSPECTIVE

**Introduction** When the Fishery Conservation and Management Act (FCMA) was implemented in 1976, fishermen were elated. The large foreign trawlers that were depleting the stocks and negatively impacting all the New England fisheries, including Rhode Island, would be banned from fishing the waters within 200 miles of the coastline allowing the fish to recover for the benefit of U.S. fishermen. This change stimulated investment in new boats and gear. It was not long, however, until fishermen began to realize that they were going to be more strictly managed. By 1977 fishermen began to complain about quotas that they felt were unfairly imposed by the new U.S. management regime, a combination of regional councils that were supposed to provide representation of the fishing industry and NOAA Fisheries (the National Marine Fisheries Service). Negative attitudes towards this management system began early and intensified through the years. The following provides a brief context for the social impacts of fishery management on the Rhode Island fishing industry.

**The Historical Context** The state of Rhode Island is home to fishing traditions that are centuries old. The first British settlers, adopting Native American customs, began exploiting marine life for subsistence in the New England region in the early 1600s. The first recorded commercial fishing operations in Newport and Sakonnet Point date back to the 1700s, therefore making it reasonable to conjecture on the importance of the activity to the local economy and subsistence during Rhode Island's early stages of development. Although in the 18<sup>th</sup> century fishing was not yet established locally as a steady economical activity--the 1790 census lists only one head of household in the state whose primary job was fishing -- many farmers, who constituted the majority of the working force, fished part-time when agricultural activities were in their off-seasons (Gersuny and Poggie 1973).

The first commercial and subsistence fishermen of Rhode Island relied mainly on simple techniques such as hook-and-line, floating fish traps, and beach seines. In Point Judith, current location of the state’s most important fishing port, seine fishermen often fished from the beach, using a small rowboat and two men throwing the net over the stern to surround the fish. Occasionally, spot fishermen on horseback signaled the location of fish schools from ashore using flags on long poles. As many as sixteen men were needed to haul in the nets, making it not unusual for neighbors to help in exchange for a share of the catch.

The period dating from 1800 to the early 1900s is believed to have been primarily characterized by “nearshore fishing exploitation” in the state of Rhode Island. The menhaden fishery, which started commercially around 1867, was practiced seasonally by “fishing gangs,” and was the primary fishing resource until its decline in the 1940s. In 1889, 89 percent of the 127 million pounds of fish landed in the state were comprised of menhaden that was sold for fertilizer for \$1 per thousand. During the 1800s, menhaden fishermen could make up to \$100 per month from their catch. Bass fishing was also reported for the late 19<sup>th</sup> century in Rhode Island, where a number of “fishing gangs” fished primarily for that species (Poggie and Pollnac, Eds. 1980).



Throughout the 1800s, New England fisheries underwent several changes brought by the use of new technology. In Point Judith, records dating from the 19<sup>th</sup> century show the introduction of new fishing techniques such as trolling, lobster traps, and barrel traps. Although steamships had been successfully introduced into fisheries at the time, by 1885 Point Judith's fishing industry was comprised entirely by a couple of sailboats and approximately 130 rowboats (Gersuny and Poggie 1973). Nonetheless, the Rhode Island fishery was gaining strength, and the state's fishing industry was expanding beyond the local market. The port of Newport offered a steamship service overnight that transported local catch to be sold the next morning in New York markets, inducing Point Judith's fishermen to haul their catch to Newport on a regular basis.

Although Rhode Island's fishing industry saw itself in an ascending trajectory during the late 19<sup>th</sup> century, it was also then that the first conflicts began regarding declining fish stocks and the use of different fishing technologies. In 1870, the Rhode Island General Assembly named a special committee to investigate a dispute in which hook-and-line fishermen alleged that the disappearance of a number of species in the Narragansett Bay was due to the use of fish traps and seines. Although the investigation did not yield any revealing conclusions, thus not resulting in the adoption of any specific measure to overcome the conflict in place, its importance lies in how well it illustrates the origins of a familiar scenario of debate in the history of U.S. fisheries, repeated often by the introduction of innovative fishing technology.

The Port of Galilee located in Point Judith has been Rhode Island's largest and most fruitful fishing port for many decades, ranking numerous times among the East Coast's most productive fishery landing sites. Before the Port of Galilee was established as number one port in Rhode Island, Newport was the principal fishing port for the state. While the Port of Galilee developed, Newport tended to decline. Although by the mid-1960s the port of Newport reemerged as an important fishing port in Rhode Island, its character as a mainly tourist attraction prevailed.

The rise of the Port of Galilee into becoming the most important fishing port in the state of Rhode Island was due essentially to two large construction projects finalized in the early 1900s. The first project, adopted in 1889, involved the construction of a "harbor of refuge," that consisted in the placement of three extensive breakwaters totaling more than 11,800 feet. Point Judith, protruding into the Atlantic at the mouth of Narragansett Bay, had long been a danger to coastal shipping between New York and Boston ports. Therefore, the construction of a harbor where ships could seek refuge and avoid sailing during extreme weather conditions was naturally welcome.

The other large intervention that contributed to the success of the Port of Galilee was the dredging of the channel into Point Judith Pond. Shifting sand deposits at the pond's outlet to the sea obstructed recurrent navigation, limiting the access of large steamship boats into the harbor. The project for the opening of the breach way was received with strong opposition by the United States Army Corps of Engineers on the grounds that the benefits associated with opening the pond were too narrow to justify the exorbitant costs of the construction. Therefore, even though the first debates concerning the opening of the Point Judith Pond began in the late 1800s, dredging was only initiated around 1904. Although the

motivation for improving the port was not primarily related to the fishing industry, impacts of the two interventions on the productivity of the local fisheries were evident: records show that landings increased from 300 tons in 1895 to 3000 tons in 1935 (Gersuny and Poggie 1973).

In 1935, major improvements were made to the Port of Galilee. The government expended \$300,000 with the construction of two piers and the dredging of a thirty-five acre anchorage basin inside the pond, in a project which was partially aimed at providing jobs during difficult times for the U.S. economy. Subsequent to these improvements, fish landings increased drastically reaching a total of 17,000 tons in 1945. The fishing industry continued to prosper in the following decades, and despite capital shortage associated with the World War II, both tonnage and value of catch continued to rise, reaching a record of 142 million pounds in 1957 (Marshall 1973).

The extremely large landings observed for the periods that follow the early 1930s can be comfortably associated with the introduction of the first large trawlers in the New England fisheries. As inshore menhaden stocks plummeted, technologies allowing efficient pursuit of fish farther from shore became available. The otter trawler became the primary method in the early 1930s employed in the hunting of mostly whiting and red hake. The successful implementation of the off-shore fleet in Point Judith would seal the future of the Port of Galilee as the primary port in the state of Rhode Island and one of the most important landing sites in the U.S. East Coast.

The year of 1947 was marked by one event that would contribute immensely to the success of the Port of Galilee and the Rhode Island fishing industry as a whole: in October of that year, the Point Judith Fishermen's Cooperative Association was born. The co-op was established as a means to look out for the economic interests of the local fishermen. As the fleet grew and transformed from a shore fishery into a vessel fishery, private interests in the receiving and transporting of the catch subjected the fishermen to manipulation by the fish-market middlemen who charged the highest possible prices to handle the catch. Therefore, in order to protect their interests, sixty-five local fishermen formed the cooperative that abolished the outside middlemen and put in the fishermen themselves at an advantage in the bargaining market for fish products.

Although the cooperative ensured higher fish prices and therefore higher incomes for the fishermen, gross landings of many important species began to decline after 1960. As a response to this decline, Rhode Island fisheries went through a phase of diversification in species, in an effort to maintain a relatively stable amount and value of total landings. As part of this diversification process, offshore lobstering was introduced in the early 1960s. Moreover, new methods such as wing trawls and pair trawls were employed primarily for the effective capture of herring, which probably contributed with this species decline in the mid-1970s.

The acknowledgment of the decline in fish stocks in the early 1960s accentuated the animosity between U.S. and foreign fishermen whose activity intensified considerably in the mid 1960s. Traditionally, New England and Canadian fleets had the fishing grounds off the New England coast to themselves. In 1960 U.S. fishermen were responsible for landing 90

percent of the resources harvested in Georges Bank grounds and Canadian fishermen for landing most of the remaining 10 percent. It was in that same year that the first modern foreign “factory ships” arrived in New England waters. By 1972 American fishermen landed a little over 10 percent of the harvest from Georges Bank (Doeringer *et al.* 1986).

**The Fisheries Conservation and Management Act to Today** The intensification of foreign fishing off the coast of New England and the prominent decline of important fish stocks, as well as the strengthening of a fisheries science that had initiated a debate over sustainability of fishing resources in the mid-1950s (see Gordon 1954) set the stage for the implementation in 1976 of the Fisheries Conservation and Management Act (FCMA). The FCMA set a new regime in the U.S. fisheries; one in which the open access to the seas and its resources was no longer accepted. The main transformations proposed by the FCMA were the establishment of a 200 mile U.S. Exclusive Economic Zone (EEZ) and the development of eight regional councils for managing the fisheries.

The implementation of the FCMA was highly encouraged and celebrated by the U.S. fishermen, who saw the exclusion of the foreign fleets out of New England waters as the main solution for prosperity of local fish stocks, especially that of groundfish. This feeling was expressed by one fisherman, “*When they imposed it, it was good. Because if they didn’t do that – the foreigners, they’d come over here and they cleaned [it] right out.*” (Newport Historical Society 1987). The FCMA and the establishment of the EEZ was seen by the U.S. authorities as a way to boost the domestic industry and also to protect national boundaries during the cold war. For fishery scientists, the FCMA represented the first step towards controlling fishing pressure on fishery resources. For local fishermen, the Act was seen a means to regain full control over fishing grounds and empower family owned and community-based businesses. It is not difficult to see how the various interests in play would eventually bring about antagonism. This idea is expressed in the words of one fisherman:

*“What the fishermen were looking for was to get rid of the foreign fleets. What a lot of people were looking for, particularly people in the bureaucracy, was a management system that would protect the resources and manage the fishermen regardless of whether they were foreign fishermen or domestic fishermen. What we ended up with was something that was a mix. It began a process of getting rid of the foreign fleets, but it also put a system of domestic management – a regional council system that we operate under today. That brought a lot of changes in how domestic fisheries are conducted – a lot more rules and regulations under which fishermen have to operate”* (Newport Historical Society 1987).

The years following the implementation of the FCMA met the local fishermen’s expectations and were fruitful for the industry in all New England: “*We noticed a difference right after that and it took a few years for the stuff to start to come back*” (Newport Historical Society 1987). The fishery experienced a great deal of expansions and modernization throughout the late 1970s and 1980s. In 1977 groundfish landings in New England increased approximately 34 percent in comparison with the previous year (Doeringer *et al.* 1986). As a consequence of the prosperity and excitement attributed to the implementation of the Act

and the subsequent incentives provided by the federal government, the fishing industry increased its capacity enormously. Offshore and inshore fishermen bought new boats, and new docks were built along the East Coast; the late 1970s were especially welcoming times for newcomers and the fishing industry became a reliable and thriving source of employment for many Americans.

The rush, however, was short lived. Overcapitalization, combined with an increase in costs of the activity, contributed to the overexploitation of some of the most important resources off the coast of New England. Some fisherman attributed the overcapitalization in the fishery to excessive incentives by the federal government, as stated by one fisherman from Newport “[the government] made a lot of money available for the fisheries. [...] What they did is they made a lot money available on cheap loans and things like that and they did it wrong” (Newport Historical Society 1987). The threat of overfishing caused by the boom in the industry led to more aggressive responses by the New England regional council that, now using the FCMA as a robust legal tool, imposed measures to severely restrict the groundfish fishery.

During the period that followed the adoption of the new management system, boats had caught more fish than they were allowed by law, which culminated in the closure of haddock, cod and yellowtail fisheries in 1977. The new system also brought intense competition between fishermen who saw themselves under pressure to catch fish faster than the “rival” boats in order to obtain a favorable portion of the Total Allowable Catch (TAC) imposed. As fishermen were not allowed much adaptation time into the new system, and managers put pressure for strict conservation measures, conflicts naturally burst forth that would dramatically mark the relationship between fishermen and managers with a lack of trust and empathy.

Although the first conflicts of interest between fishermen and managers began during the decade that followed the implementation of the FCMA, that was also a time marked by great technological advancements and investments in the fishery off the coast of New England. High speed diesel engines, lightweight nylon nets, radar and sonar, and hydraulic systems to haul in the nets, all contributed to making fishermen better at what they do. Despite the new rules put in place to regulate the fisheries, vexed fishermen found loopholes and ways to transcend the laws. One member of the Rhode Island Marine Fisheries Council said that, by the mid 1980s, due to new technology, “it became possible to fish every piece of the ocean bottom” and New England fishermen “were overfishing the area as hard as the Russians” (Davis, 2007).

By the end of the 1980s decreases in stocks coupled with increases in costs for fishing supplies and boat insurance began to have impacts on the Rhode Island fishing industry. James A. McCauley, president of the Point Judith Fishermen’s Cooperative was quoted by the Providence Journal (January 28, 1990) as saying, “I’d like to say it can’t get any worse. But I’m not sure that’s the case” (Fitzpatrick 1990). A prophetic statement—the cooperative failed in 1994. While its failure has been attributed to overcapitalization, some local fishers suggested to Pollnac that pricing and poor market conditions might have also contributed to the failure. Several fishers, descendants of the original founders, suggest that it expanded too rapidly, building expensive new facilities that resulted in larger shares of the

catch going to the cooperative to pay off loans. This resulted in some fishers leaving the cooperative and selling their catches elsewhere. This along with the decrease in landings in the early 1990s resulted in a situation where the cooperative had trouble paying its bills and went bankrupt. One fisherman plaintively said, *“I’d still fish for the co-op if it were here”* (Pollnac 2003).

The 1990s also brought significant new challenges to the already uneasy relationship between fishermen and regulators in New England. In June 1991, the Conservation Law Foundation (CLF) took the National Marine Fisheries Service (NMFS) to court on the basis that the groundfish management plan adopted by the New England council was negligent to the fragile status of the stocks. Data showed a decline in groundfish landings from 1.6 billion pounds in 1965 to less than 220 million pounds in 1991 (Buck 1996). As a consequence of the lawsuit, a consent decree was signed in which authorities agreed to implement a plan that would rebuild the stocks of cod, yellowtail and haddock in periods of 5 to 10 years. The plan imposed a decrease in 50 percent of all groundfish landings in order to succeed. Under heavy protest by the fishermen who claimed that the new management plan would force many to leave the fishery and cause a great deal of boat owners to go bankrupt, Amendment 5 was passed in 1994 imposing many restrictions to the groundfish fishery.

The provisions imposed on the groundfish fishery in the mid 1990s had severe impacts on the way fishermen conducted their activities. Amendment 5 reduced and constrained considerably the amount of days at sea (DAS) boats had to harvest their share. As stated by one fisherman concerning the impacts of the constraints on DAS: *“now all of a sudden you are on the clock from the minute you get out past the demarcation buoy so you had to change things”* (NOAA 2011). Amendment 5 also imposed constraints on mesh size, minimum size limits, closed areas, and changed logging reporting procedures. All these measures were adopted with very little consideration to the impacts they would have on the job satisfaction and well being of fishermen and their communities.

The groundfish fishery was the sector of the industry most affected during the years that followed the implementation of the FCMA due to the frail status of the stocks. However, the complexity of regulations was increasing for all the fisheries. Lobster resources were traditionally managed on a state by state basis that imposed rules mainly on legal size. After the implementation of the FCMA, lobster management in the U.S. became a more cohesive unit and measures to regulate outputs as well as inputs in the fishery became stricter. The same pattern is observed for the scallop fishery, as it was stated by one fisherman when asked about the best years for him as a scalloper in the fishing industry: *“For me it was the early 1990s. The regulations were not so stringent, you could do more. I mean I worked in the 1980s for people but even back then [...] there was a lot more freedom. You could catch a lot more and you weren’t reporting every second”* (NOAA 2009).

The increase in complexity of regulations affected not only the fishermen – *“anyone out there fishing at any hour of the day is probably in violation of something”* (Davis 2007) – but also the enforcers: *“back in 1984 the officers had to contend with two or three fishery plans [...]. Now there are 65 pages and there 22 plans”* (Davis 2007). Be it in federal or state

waters, the complex body of rules constraining New England fishermen imposes a great deal of pressure on them. One fisherman's wife said: "*[with] every new regulation he gets all discouraged and I get depressed [...] but then he seems to adapt to it. But [it] seems to me that sooner or later there is going to be another one...*" (NOAA 2004).

In 1996 the FCMA was re-authorized and amended extensively with the implementation of the Sustainable Fisheries Act (1996). The FCMA was then also renamed Magnuson- Stevens Fishery Conservation and Management Act, commonly referred as the Magnuson-Stevens Act, in honor of senators Warren G. Magnuson and Ted Stevens, both having important roles in the implementation of the fisheries regulatory body in the U.S. One important contribution of the Sustainable Fisheries Act (1996) was the recognition of impacts that regulations have on fishing communities expressed in National Standard 8. Although the Magnuson-Stevens Act takes into consideration the economic well-being of fishing communities, little improvement has been made so far to truly balance sustainability of resources and livelihood.

The general discontent with the path fisheries regulations took in New England since the implementation of the FCMA in 1976 is expressed by the following quotes by Rhode Island fishermen and one fisherman's wife:

*"I think the industry is a lot different now. I think is much more of a grind than it used to be"* (NOAA 2008);

*"[...] he's not making enough money in the summer sometimes that he can see himself making because of all the regulations. There is plenty of fish out there. He can't catch them all [...] because the government doesn't let him. [...] So sometimes to make ends meet he goes out on these bigger boats, which he risks his life to go out on"* (NOAA 2008);

*"[...] they decided they were going to cut back out effort some more even though we had reached the goals that they stated. So I said, well, it is a losing battle and we are never going to win. We get regulated by every federal agency there is"* (NOAA 2011).

Throughout the last decade, fisheries management in New England has been focused heavily on the implementation of limited entry measures generally described as "catch shares." NOAA defines catch shares as "management strategies that include Limited Access Privilege Programs (LAPP) and individual fishing quotas that dedicate a secure share of fish to individual fishermen, cooperatives or fishing communities for their exclusive use" (NOAA 2010). Although the first catch share program was implemented in the U.S. in the early 1990s, this type of management strategy has more recently received a great deal of attention, culminating in the implementation of Amendment 16 in May 2010 that instituted and set the rules for "sector management" in the groundfish fishery.

The implementation of sectors was received with a lot of controversy by the industry. The main objective of the new management system was to substitute for the DAS system previously in place. Fishermen fear, however, that negative effects on entire communities as a consequence of sector management will not be outweighed by any positive effects on fish stocks. In an article published by the blog About.com in March 2011, Dick Grache, a Point Judith fisherman stated:

*“There was no demonstrable scientific need in 2010 for a drastic change in the management regime to the new catch shares or for a further reduction of the catch limits at that time. The input control or days-at-sea system had seen the majority of fish stocks return to health, some were completely rebuilt, and most were not being overfished and were progressing toward sustainability. A fishery will fail under any type of management scheme if there are simply not enough fish in the system that can be landed, whether it's a days-at-sea, or a hierarchical point system, or a catch shares/sector model. What effects fish mortality is Total Allowable Catch (TAC), not who owns what percentage of the TAC” (Grache 2011).*

Grache's statement points out to a very important issue of debate concerning the implementation of catch share programs: fairness. Many fishermen believe the criteria for allocation of shares between sectors, basically based on historical landings, to be unfair, and moreover that the implementation of the new system will lead to major consolidation in the industry putting a lot of people out of business and leaving few with control over the resources. Some of the quotes from oral histories conducted by NOAA social scientists in 2010 and 2011 with Rhode Island fishermen capture well the industry's mixed sentiment concerning sector management and catch shares in general:

*“The downsides to that whole system is, among the things we are seeing, consolidation of the fleet [...] and [...] I think the way the allocations were done in that very first year. I think [allocations] were very unfair to certain people. [What] they did is strictly on a history basis” (NOAA 2011).*

*“[Before sectors], you had X amount of days at sea so it was somewhat of a level playing field, well then they went to a total history, it kind of made that currency, that former currency of days at sea null and void at that point. So there were guys [...] that bought a license and a boat and they couldn't get now what they paid for it five years later. It has really put them under an ax almost impossible to climb out” (NOAA 2011).*

*“[T]he catch share system [...] is something we fought against for a long long time because it is going to lead to consolidation and you can see that over and over again in history and other fisheries once you move into that sort of system” (NOAA 2010).*

*“I don't understand [sectors] to be perfectly honest with you. Except that, you know, I see a lot of changes, I see people's income every year and I see a lot of changes and not for the good” (NOAA 2010)*

Although recently there has been increased concern among the scientific community for the socio-economic health of fishing communities and the importance of conducting Social Impact Assessments (SIA) as part of the protocol for the implementation of fishery management plans, the trend in New England fisheries management continues to reinforce distrust between fishermen and managers. This sentiment of distrust and suspicion is reflected in this quote by one Point Judith fisherman, *“It is asinine the way they manage fish, but it is not really, if you think about what their ultimate goal is. The ultimate goal is not to save fish, the ultimate goal is to save their jobs. If you look at it from that prism, it makes*

*perfect sense the way they manage”* (NOAA 2010). This feeling of mistrust and often betrayal strongly influences Rhode Island’s fishermen’s perceptions of the future of the industry in the state, as evidenced in the following quotes:

*“I would say, within 20 years, I feel we’ll be extinct due to pressures from protective resources and [...] the radical attempts to change fishing regulations in what we’re allowed to catch, sizes, amounts”* (NOAA 2010).

*“[...] I would not advise anybody to get into fisheries because they are going to get hammered. I think the fleet is going to continue to diminish and I think the ultimate goal of the government is to have four or five large companies, just like they do right now in the surf clam industry, that they can tax to the limit, and it is a lot cheaper for them [...]”* (NOAA 2010).

The many pages of transcribed oral histories of Rhode Island fishermen and their wives tell a story worthy of the attention of fisheries managers and members of the public who will be influenced by what happens to the industry. Fishermen are generally in favor of the adoption of fishery management plans; they agree the resources must be exploited in a sustainable and conscientious fashion. They are concerned however that their interests are not being assigned a proper level of importance, and that the future of the Rhode Island fishing industry is being jeopardized by management strategies focusing almost exclusively on reducing effort with little consideration for the socio-economic impacts these measures might have -- *“I know in Point Judith alone the fleet is reduced by thirty percent over the last five years alone. There are a lot fewer boats in Point Judith than there used to be”* (NOAA 2010). With the downfall of the fishing industry, Rhode Island faces the degeneration of a valuable part of the state’s culture and a tradition nurtured by hard-working families for centuries. One fisherman’s wife states, *“[...] [fishermen] have salt water in their veins”* (NOAA 2008); a fisherman declares *“[...] if I have something to do that I get to put on my boots, it’s like slipping into little wombs, and it feels good, the wooden docks feel good under my feet, and the boats feel good”* (NOAA 2008). With fishing it is hard to separate the job from the passion they feel for their occupation. They love the adventure, challenge and freedom associated with fishing at sea, the loss of which, with no comparable alternatives, will plunge them into the depths of the despair of job dissatisfaction and its accompanying social ills. The remainder of this paper quantifies their attitudes towards management and its impacts on job satisfaction and the well being of fishermen and their communities.



### 3 MANAGEMENT ANALYSIS

#### Demographic Profile of Surveyed Fishermen

Fishermen who participated in this study were interviewed with a structured questionnaire that included demographic information (Table 3.1). The questionnaire provided detailed information about their participation in fishing as well as their participation in, and views on, the management process. Participation in the fisheries management process was evaluated based on demographic characteristics (age, education, years fished, family) as well as principal fishery, crew status and gear type.

<b>Table 3.1 Demographic profile of Surveyed Fishermen</b>							
		<b>Years fished</b>	<b>Generations fished</b>	<b>Number of immediate family</b>	<b>Number of other relations</b>	<b>Age</b>	<b>Years of education</b>
n= 137 <sup>1</sup> Overall	Min	1.0	1.0	0.0	0.0	18.0	8.0
	Max	57.0	5.0	10.0	6.0	75.0	20.0
	Mean	24.0	1.9	1.1	0.4	43.6	13.2
n= 17 Groundfish	Min	2.0	1.0	0.0	0.0	30.0	8.0
	Max	50.0	4.0	3.0	6.0	66.0	16.0
	Mean	30.3	2.1	0.6	0.6	49.6	12.6
n=5 Scallops	Min	3.0	1.0	0.0	0.0	26.0	9.0
	Max	30.0	3.0	5.0	0.0	62.0	17.0
	Mean	13.0	1.6	1.6	0.0	39.2	13.4
n= 71 Lobster	Min	1.0	1.0	0.0	0.0	18.0	10.0
	Max	57.0	5.0	5.0	4.0	75.0	20.0
	Mean	23.8	1.9	0.9	0.4	43.2	13.7
n= 29 Squid	Min	4.0	1.0	0.0	0.0	24.0	11.0
	Max	42.0	3.0	10.0	4.0	60.0	16.0
	Mean	24.1	1.9	1.7	0.4	43.4	12.7
n= 15 Other <sup>1</sup>	Min	5.0	1.0	0.0	0.0	25.0	10.0
	Max	39.0	5.0	3.0	4.0	54.0	16.0
	Mean	22.8	2.0	1.4	0.6	42.2	12.1

<sup>1</sup> One fewer case than total sample (138) is due to missing data on principal fishery.

It is commonly thought that the mean age of fishermen is rising and there are more people leaving than entering the fishing industry. The results of the survey provided a snapshot sample of the age structure and demographic characteristics of Rhode Island fishermen in 2010 by fishery. These data do not provide a time history of participation, but the age structure and length of engagement in fishing is some indication of the trends in participation. Similar data was collected in 1977 (Acheson et al., 1980) and can be used for comparison (Table 3.2). In 2010, the overall mean age for fishermen was 43.6 years and ranged between 49.6 for groundfishermen and 39.2 years for scallop fishermen, a full 10 year difference. In contrast, in 1977, the overall mean age for 79 RI fishermen was 33.9 years and ranged from 17 to 60 years old. The overall mean for years engaged in fishing in 2010 was 24 years and ranged from 13 for scallop fishermen to 30.3 years for groundfishermen. It is worth noting that the minimum number of years fished ranged

from 1 year for lobstermen to 4 years for squid fishermen, and all fisheries had at least one respondent with 5 or fewer years fished. These results suggested that there were at least some new recruits seeking fishing as a livelihood in 2010. Lobster fishing had both the lowest and highest years fished as well as the lowest and highest ages, which might indicate a lower entry requirement for experience and lower risk or cost for maintaining participation. Scallop fishing had a low maximum age (62) and the lowest number of years fished (13) which might indicate a higher risk or cost for maintaining participation. Overall the mean age of 43.6 years and 24 years fishing indicated that the fishermen in Rhode Island in this 2010 sample had extensive experience and have found a way to continue fishing despite changing conditions.

Family history in fishing can indicate both the strength of connectedness to the profession as a way of life as well as the vulnerability of this lifestyle. While there were fishermen in the Rhode Island sample that are the first generation in their family to pursue fishing as a profession, there were also multigenerational fishing families (as many as 5 generations, Table 3.1). Including the interviewee as one generation, the overall mean for fishermen in this study was 1.9 generations showing family histories that in most cases spanned two generations. The mean education in Rhode Island fishermen was slightly above secondary school (13.2) with one lobsterman with 8 years of post-secondary education.

<b>Table 3.2 Demographic results for Fishermen in 1977</b>	<b>Age</b>
N of Cases	79
Minimum	17.0
Maximum	60.0
Mean	33.9

### **Engagement in the Management Process**

What was the nature and level of engagement of Rhode Island fishermen in the fishery management process in 2010? What was the difference between those that do participate and those that do not? A series of questions were asked related to different types of participation in the fisheries management process including membership in fisheries related organizations, attendance at meetings where management issues are discussed, whether or not one talks at meetings or urges others to participate, use of the internet, and reading industry related publications.

Table 3.3 shows relationships between different demographic characteristics and types of participation in fishery management activities. Cell values represent the mean for each demographic and participation variable combination. Cells with an asterisk\* indicate statistically significant differences between “no” and “yes”. For example, those that do belong to fishermen’s organizations have fished for 30.8 years while those that do not have fished for only 20.4 years, a ten year difference. Those that belong to fisheries organizations have 10 years more fishing experience, a longer family history in fishing, are older by nearly nine years, and more highly educated than those that do not belong. Those that attend meetings where fishery management issues are discussed have fished more than 10 years longer and are more than 8 years older than those that do not attend. Of those that attend meetings, those that talk at meetings tend to have 1 year more education than those that do not talk. The use of internet to obtain information on fishery or fishery management regulations is also related to age. Not surprisingly, those that use the internet are nearly 5 years younger than those that do not. There were no statistically significant

relationships based on family involvement in fishing. The results suggest that fishermen with greater life experience are more likely to participate in the fishery management process.

<b>Table 3.3 Participation in the Fisheries Management Process</b>							
<b>Variable</b>		<b>Belong</b>	<b>Attend</b>	<b>Urge<sup>1</sup></b>	<b>Talk<sup>1</sup></b>	<b>Internet</b>	<b>Read</b>
Number of years fished	No	20.4	18	25.7	26.9	27.2	20
	Yes	30.8**	28.6**	29	29.4	23.8	25.7
Number of generations fished	No	1.6	1.5	1.8	1.9	2	1.8
	Yes	2	1.9	1.9	1.9	1.6	1.7
Number of immediate family fishing	No	1.4	1.3	2	2.1	1.6	0.9
	Yes	1.4	1.5	1.1	1.2	1.3	1.5
Number of other relations fishing	No	0.6	0.6	1.1	0.6	0.8	1.2
	Yes	1.1	0.9	0.8	1	0.8	0.7
Age	No	40.7	38.8	46.3	46.3	46.8	39.7
	Yes	49.4**	47.3**	46.9	47.7	42*	43.9
Years of Education completed	No	12.8	12.9	13.3	12.6	12.9	12.8
	Yes	13.9**	13.4	13.5	13.8*	13.4	13.3
<sup>1</sup> Only those that attended meetings 2- tailed t test * p ≤ 0.05 ** p < 0.01 *** p < 0.001							

### **Participation by Crew Status, Fishery, and Gear Type**

To effectively reach all members of the fishing community there is a clear need to better understand those that participate in the fishery management process and those that do not. What are the characteristics of those actively involved and those who are less engaged, or not involved in the management process? Here we evaluate different types of participation in relation to crew status, fishery, and gear type. We summarized information for those that answered yes to the questions related to various types of participation in the fishery management process (Table 3.4). The first row shows that 67 percent of captain owners interviewed belonged to at least one fishermen’s organization while 21 percent of captain-non-owners and 2 percent of crew belonged. Captain owners had the highest rate of attendance (78%) at public meetings where management issues were discussed while crew had the lowest (24%). Of those that attend meetings, 62 percent reported that they talk, present ideas, or debate issues. Of these a greater number of crew (58%) indicated that they were likely to talk than were captains (44%) but less than captain owners (86%).

When considering how to garner greater industry involvement in the management process, it is worth noting that the highest overall level of participation was for reading

publications related to fisheries, and that was consistent across all crew types (>80%). Use of the internet to gather information on fisheries or the fisheries management process was also notable across all groups. When looking at participation by fishery, Table 3.5 shows that there was a statistically significant difference between fisheries for reading

industry related publications. One hundred percent of squid fishermen surveyed read industry publications. This is in contrast to scallop fishermen of which 60 percent reported reading industry publications. Table 3.6 shows a statistically

significant difference between dredgers and gillnetters who indicated they were likely to talk, while only ¼ of “other gear” types would talk (Tables 3.5, 3.6).

	<b>Captain Owner %</b>	<b>Captain %</b>	<b>Crew %</b>	<b>Total %</b>	<b>p value<sup>2</sup></b>
Belong	67	21	2	34	0.000**
Attend	78	64	24	56	0.000**
Urge <sup>1</sup>	70	55	91	68	0.105
Talk <sup>1</sup>	86	44	58	72	0.003*
Internet	71	65	59	66	0.419
Read	85	96	81	86	0.185

<sup>1</sup>Only those that attend meetings  
<sup>2</sup> Significance for difference between those that did participate and those that did not. Chi-Sq test \* p < 0.01 \*\* p < 0.001

	<b>Groundfish</b>	<b>Scallops</b>	<b>Lobster</b>	<b>Squid</b>	<b>Other</b>	<b>p value</b>
Belong	35	20	35	31	39	0.948
Attend	53	40	49	72	69	0.201
Urge <sup>1</sup>	44	100	65	80	75	0.293
Talk <sup>1</sup>	75	100	82	57	67	0.275
Internet	71	40	66	69	54	0.633
Read	71	60	87	100	85	0.024*

<sup>1</sup>Only those that attend meetings Chi-Sq test \* p < 0.05

	<b>Dragger</b>	<b>Dredge</b>	<b>Trap/pot</b>	<b>Gillnet</b>	<b>Other</b>	<b>p value</b>
Belong	31	29	37	29	60	0.732
Attend	67	57	50	29	80	0.172
Urge <sup>1</sup>	69	100	64	100	75	0.599
Talk <sup>1</sup>	62	100	82	100	25	0.045*
Internet	69	29	66	72	60	0.330
Read	89	57	88	71	100	0.113

<sup>1</sup>Only those that attend meetings Chi-Sq test \*p < 0.05

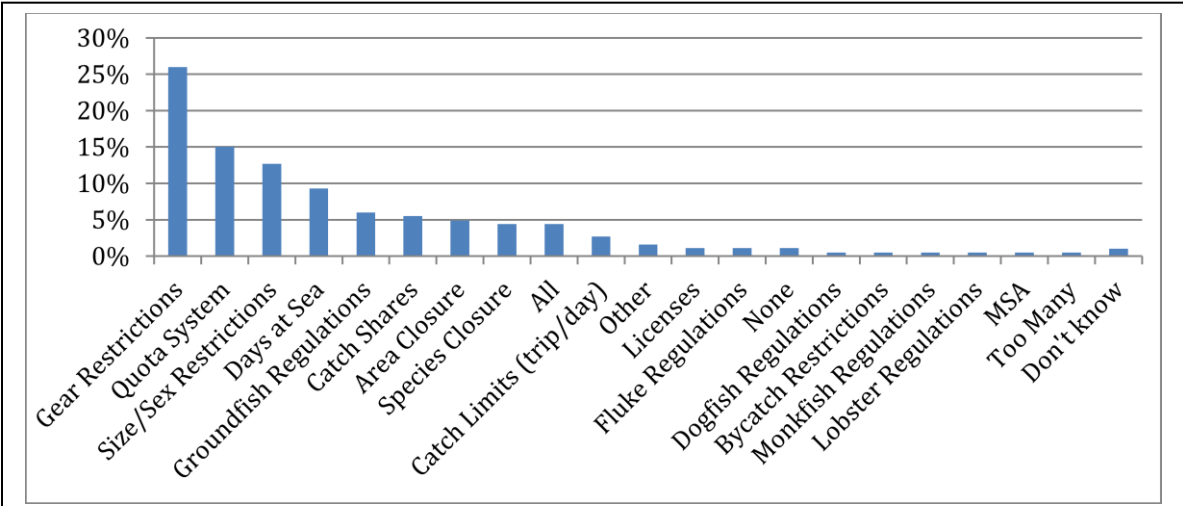
## **Views on Participation**

Do fishery management related organizations and meetings attended by fishermen represent a full range of perspectives, or are member's and attendee's views not representative of the full range of perspectives? Two questions were posed, "do you feel your participation makes a difference" (asked of only those that attend meetings) and "do you feel the meetings have any influence on the management plans developed" (asked of all surveyed). Both questions are based on a 6 point scale with 0 indicating "no difference" and 6 indicating a "big difference". There were no statistically significant results across crew status, fishery, or gear type. Responses were consistent and uniformly below the midpoint on the scale (2.1 for both questions) indicating that most felt that their participation had little influence on the outcome of the fishery management process. Nevertheless, 25 percent of responses were above the midpoint indicating that some think participation does make a difference.

How does this relate to characteristics of the fishermen interviewed? Correlations between scale scores concerning participation makes a difference and years fishing ( $r=-0.03$ ), generations fishing ( $r=-0.09$ ) age ( $r=0.07$ ) and years education ( $r=-0.001$ ) are not statistically significant (all  $p>0.05$ ). Similarly, correlations between scale scores on perceptions that the result of the public meetings influence management plans and years fishing ( $r=-0.03$ ), generations fishing ( $r=0.18$ ) age ( $-0.02$ ) and years education ( $-0.05$ ) are not statistically significant (all  $p>0.05$ ). Turning to the relationship between principal species fished and perceptions of the influence of meetings on management, we find that groundfish fishermen manifest a lower score than fishermen targeting either squid or lobster (means = 0.8, 2.4, and 2.1 respectively, Kruskal Wallis test statistic = 6.766,  $p<0.05$ ). With regard to perceptions that fishermen's participation in management makes a difference, we find a similar pattern, with the lowest mean for groundfish fishermen (1.33) and higher means for squid and lobster fishermen (2.3 and 2.2 respectively, but these differences are not statistically different (Kruskal-Wallis = 1.27,  $p>0.05$ ). Finally, crew status appears to have no statistically significant relationships with either perceptions that participation makes a difference (means for captains (2.9) and crew (2.1),  $U=218$ ,  $p>0.05$ ) or perceptions concerning the influence of public meetings (means for captains (2.3) and crew (2.0),  $U=1192$ ,  $p>0.05$ ).

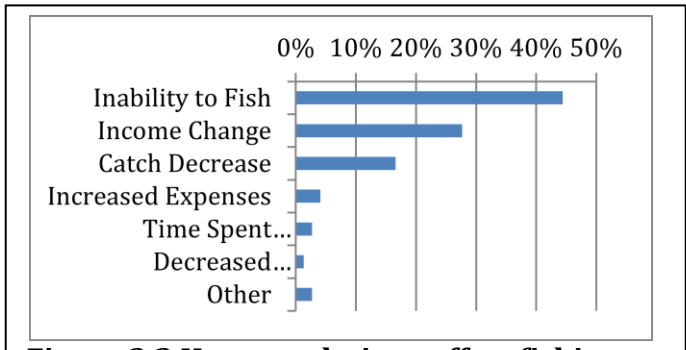
## **Impacts of regulations on fishing activity, families, and income**

Questions related to the effects of fishery management regulations on fishermen and their families identified which regulations have most affected "fishing activity", "families", and "income". For most regulations it was difficult to distinguish impacts based on these categories because all three categories yielded similar results. The top 8 regulations reported accounted for nearly 75 percent of all responses include gear restrictions, quota system, all regulations, size/sex restrictions, days at sea, groundfish regulations, catch shares, and area closures (Figures 3.1, 3.3, and 3.5).



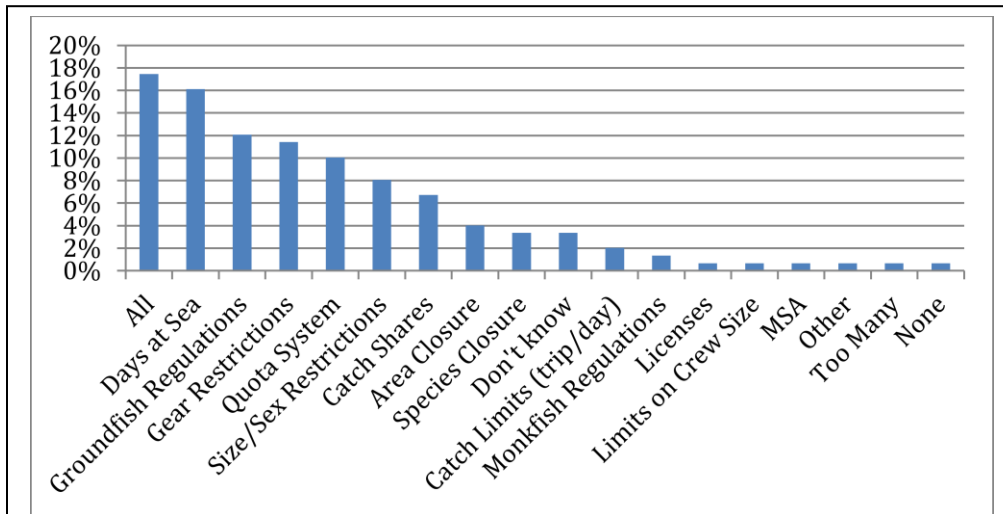
**Figure 3.1 Regulations that affect fishing activity**

The results for “how” regulations affect “fishing activity” (Figure 3.2) and “families” (Figure 3.4) were also consistent across categories with a few exceptions. Change in income, inability to fish, decrease in catch, time spent away from home, and loss of independence were shared across categories. However, stress, conflicts, and a concern for safety were only related to how families are affected. Related to “how” regulations affect income, the last of the three categories, there was insufficient data. Most reported that they had already described this in under “fishing activity” and “families”



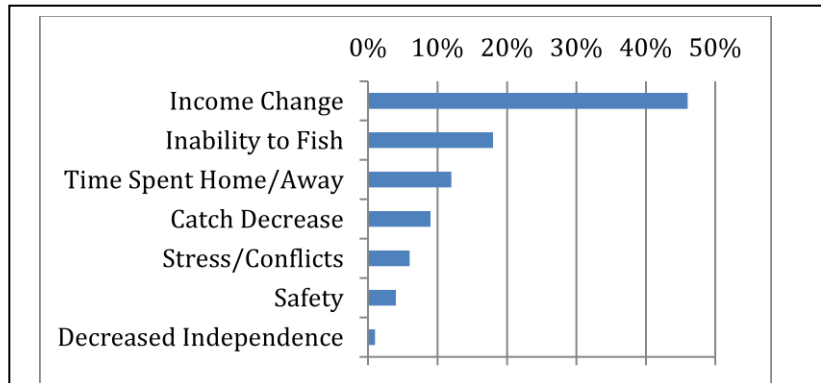
**Figure 3.2 How regulations affect fishing activity**

Figure 3.3 shows that “all regulations” was the most common response for what regulations most affect families, suggesting it is the cumulative effects of regulations more than any specific regulation that has had the greatest impact on families.



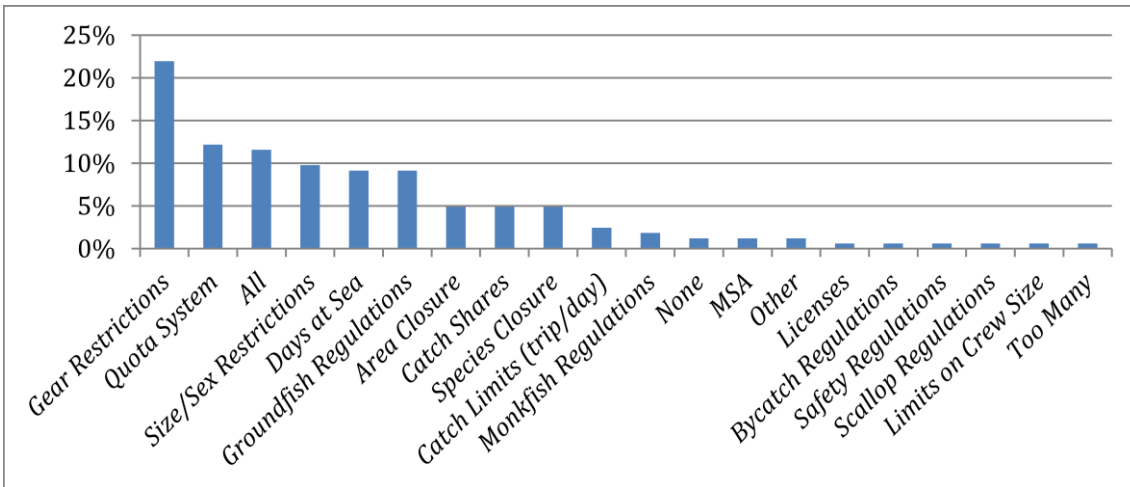
**Figure 3.3 Regulations that affect families**

As mentioned above, change in income, inability to fish, decrease in catch, time spent away from home, and loss of independence were consistent with responses to “how” regulations affect fishing activity. Nearly 45 percent of all responses identified change in income as most significant (Table 3.4).



**Figure 3.4 How regulations affect families**

Consistent with figure 3.1 and figure 3.3, the top 8 regulations reported to affect income were gear restrictions, quota system, all regulations, size/sex restrictions, days at sea, groundfish regulations, catch shares, and area closures (Figure 3.5). Nearly 23 percent of all responses identified gear restriction as the most significant. There was insufficient data to report on “how” regulations affected income as the most common response to this question was that they had already answered this in the previous questions.



**Figure 3.5 Regulations that affect income**

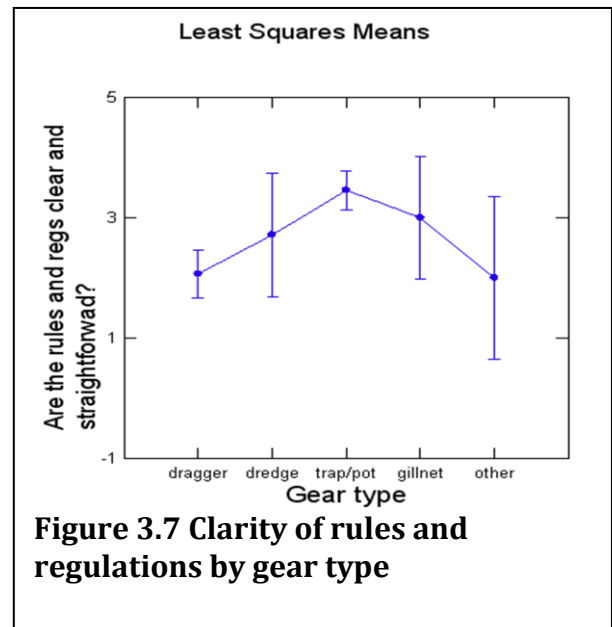
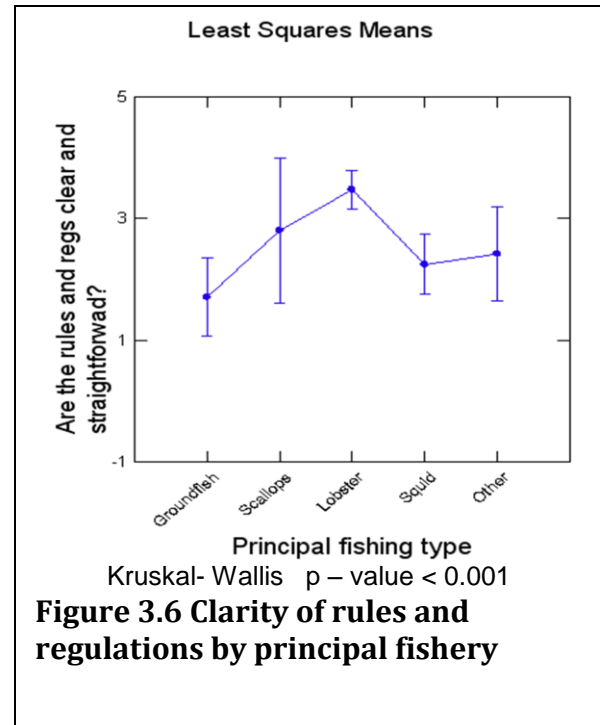


### Views on Management

To what extent “are the rules and regulations that affect fishing activity clear and straightforward”? This question is based on a 5 point scale with 1 indicating “very unclear”, 3 indicating “neutral”, and 5 indicating “very clear”. While the overall mean for all groups (2.87) was just below neutral, statistically significant differences were found for both fishery and gear type. Figure 3.6 shows a sharp difference between lobstermen and groundfishermen perspectives on the clarity of rules and regulations. The mean for groundfishermen (1.7) ranged between “very unclear” and “unclear” while the mean for lobstermen (3.5) was between “neutral” and “clear”. A similar relative difference was also found when examining gear types (Figure 3.7). The mean for those who reported dragger as their primary gear type was 2.1 indicating “unclear” while the mean for those who use traps or pots was 3.5 between “neutral” and “clear”. These results suggest that some of the fixed gear fisheries (lobster) perceive that the regulations for their fisheries were clearer than the mobile gear fisheries (trawlers and dredgers) and gillnetters.

### Income and Participation

How might economic viability influence participation in the management process? Is there a difference in participation between those that have greater financial stability than those that do not? Fishermen were asked “is your current income from your fishing business enough for you to see yourself fishing in the short term, medium term, and long term”. This question is a 3 point scale with 1 “short term”, 2 “medium term”, and 3 “long term”. The mean for this question is 2.3 indicating that most think their income is enough to sustain them in at least the medium term. However, there is a statistically significant difference for those that belong to fishing industry related organizations and those that talk at meetings. Both groups are more likely to report that their income is sufficient to see themselves fishing between the medium and long term (Table 3.7). Those who do not belong or attend are the least likely to see their income as sufficient to sustain even medium term fishing (Table 3.7).



They were also asked “how does your income from fishing this year compare to what it was two years ago”. This question is a 5 point scale with 1 “much lower”, 3 “no change”, and 5 “much higher”. The overall mean was 2.0 indicating that income at the time of the interview was lower than the previous two years. In both cases income now compared to two years earlier was “lower” to “much lower”. In contrast, there are statistically significant differences for those that did not belong to organizations or attend meetings. Both groups reported their income to be between “lower” and “no change” (table 3.8). This may indicate that those that participate in management meetings considered their livelihood more at risk than non-participants who felt less need to engage in the management process.

**Table 3.7 Income sufficient to continue to fish in short (1), medium (2), and long term (3)?**

Participation types		N	Mean	U
Belong	no	85	2.2	1,292*
	yes	42	2.6	
Attend	no	60	2.3	1,862
	yes	67	2.4	
Urge <sup>1</sup>	no	18	2.4	492
	yes	59	2.3	
Talk <sup>1</sup>	no	23	1.9	329**
	yes	56	2.6	
Internet	no	52	2.4	1,854
	yes	76	2.3	
Read	no	19	2.4	803

<sup>1</sup> Attendees only Mann-Whitney U test  
\*p < 0.01 \*\*p ≤ 0.001

**Table 3.8 Current income compared to 2 years ago: Much lower (1), No change (3), Much higher (5)**

Participation types		N	Mean	MWU
Belong	no	89	2.3	2,583*
	yes	45	1.7	
Attend	no	61	2.4	2,986**
	yes	73	1.8	
Urge <sup>1</sup>	no	20	1.9	617
	yes	60	1.7	
Talk <sup>1</sup>	no	23	1.8	675
	yes	60	1.8	
Internet	no	55	2.1	1,974
	yes	80	2.0	
Read	no	20	2.4	1,078
	yes	113	2.0	

<sup>1</sup> Attendees only Mann-Whitney U test  
\*p < 0.01 \*\* p < 0.001

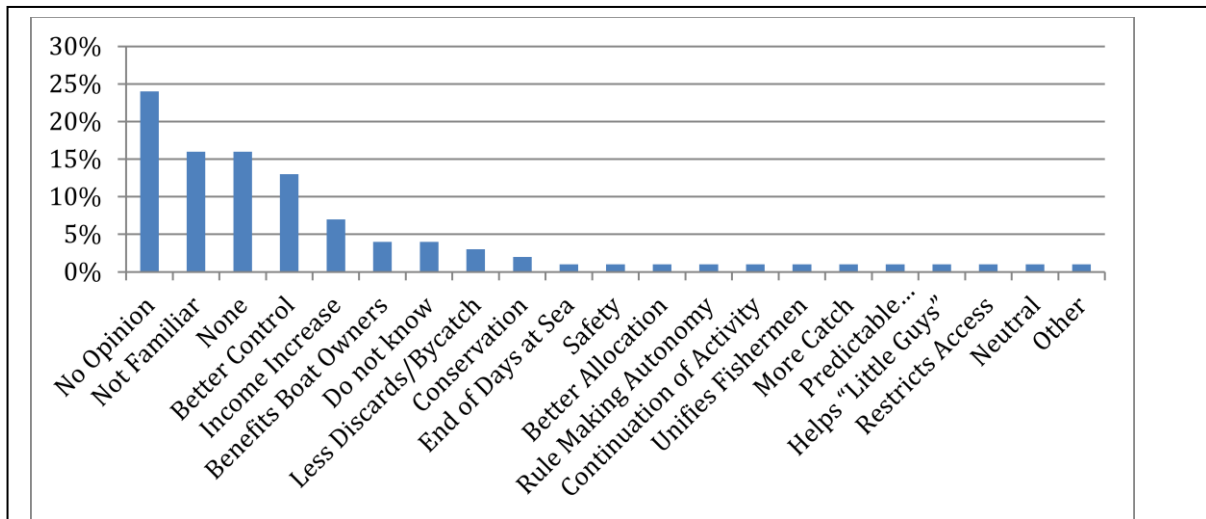
## Sectors and Participation

Is there a relationship between those that chose to join sectors and those in the common pool that did not and levels of participation in the management process? We examined this relationship using the 6 categories of participation used above “belong”, “attend”, “urge”, “talk”, “internet”, and “read”. Aside from those that attend meetings, there were no other statistically significant relationships. Twenty-two percent of those interviewed both belonged to a sector and attended meetings where fishery management issues were discussed. Of those that belong to a sector 74 percent also attended meetings.

Will views on management and participation differ for those that belong to sectors and those that do not? To determine this we evaluated sector membership in relation to the questions “do you feel your participation makes a difference”, “do you feel the meetings have any influence on the management plans developed”, and “are the rules and regulations that affect fishing activity clear and straightforward”. We found no statistically

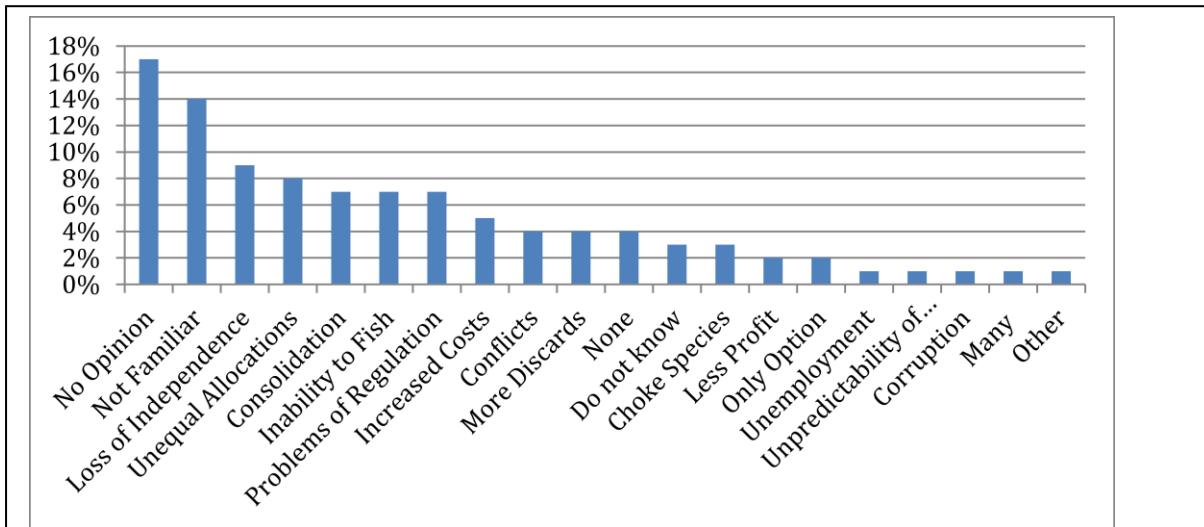
significant relationships between sector membership and whether or not sector members feel their participation makes a difference or that meetings influence the management process. However, a statistically significant relationship was found between sector membership and perceptions of the clarity of rules and regulation. The mean for sector members was 2.4, between “unclear” and “neutral” while the mean for those that did not belong to a sector was slightly higher (3.0) indicating they were neutral about the clarity of regulations.

We then turn to questions about the advantages and disadvantages of belonging to a sector. Figure 3.8 shows the advantages of belonging to a sector. It is notable that 40 % of all responses reported having “no opinion” or “not familiar” with sectors followed by 16 % of responses that identified “no advantages”. Advantages identified related to more control and autonomy; improved quality of life and job; stock conservation; and better management alternatives.



**Figure 3.8 Advantages of belonging to a sector**

Figure 3.9 shows a similar high percentage (31%) of responses related to “no opinion” or “not familiar”. The most common disadvantages related to loss of control and autonomy, inequitable allocations, increased costs, and conflicts.



**Figure 3.9 Disadvantages of belonging to a sector**

### Summary of Management Analysis

When compared to a study conducted 33 years earlier, this analysis shows that the overall mean age for fishermen (46.3) increased by 10 years for those who participated in the survey although this varied across fishery. The minimum number of years fished ranged from 1 year for lobstermen to 4 years for squid fishermen, and all fisheries had at least one respondent with 5 or fewer years fished. These results suggest that there were at least some new recruits seeking fishing as a livelihood in 2010 however this varied across fishery. Overall the mean age of 43.6 years and 24 years fishing indicates that the fishermen in Rhode Island in this 2010 sample had extensive experience and have found a way to continue fishing despite changing conditions.

Those that belong to fisheries organizations have 10 years more fishing experience, a longer family history in fishing, are older by nearly nine years, and more highly educated than those that do not belong. Those that attend meetings where fishery management issues are discussed have fished more than 10 years longer and are more than 8 years older than those that do not attend. Of those that attend meetings, those that talk at meetings tend to have 1 year more education than those that do not talk. The results indicate that fishermen with greater life experience are more likely to participate in the fishery management process.

Captain owners had the highest rate of attendance at public meetings where management issues were discussed while crew had the lowest. Of those that attend meetings, 2/3rds reported that they talk, present ideas, or debate issues. Of these the majority of captain owners reported that they talk at meetings followed by crew. It is worth noting that the highest overall level of participation was for reading publications related to fisheries, and that was consistent across all crew types. Use of the internet to gather information on fisheries or the fisheries management process was also notable across all groups.

In relation to questions on the efficacy of participation in the management process, there were no statistically significant results across crew status, fishery, or gear type. The overall mean indicated that most felt that their participation had little influence on the outcome of the fishery management process. Nevertheless, 25 percent of responses were above the midpoint indicating that some think participation does make a difference. The difference in views between those that do think “participation makes a difference” and those that do not captures the relative difference in opinions between these two groups.

Questions related to the effects of fishery management regulations identified which regulations have most affected “fishing activity”, “families”, and “income”. The most common response was “all regulations” for regulations that most affect families, suggesting it is the cumulative effects of regulations more than any specific regulation that has had the greatest impact on families. The results for the question: “are the rules and regulations that affect fishing activity clear and straightforward” suggest that some of the fixed gear fisheries (lobster) perceive that the regulations for their fisheries were clearer than the mobile gear fisheries (trawlers and dredgers) and gillnetters.

Fishermen were asked “is your current income from your fishing business enough for you to see yourself fishing in the short term, medium term, and long term”. The results indicated that most think their income is enough to sustain them in at least the medium term. However, those that belong to fishing industry related organizations and those that talk at meetings are the most likely to report that their income is sufficient to see themselves fishing between the medium and long term. Those who do not belong or attend are the least likely to see their income as sufficient to sustain even medium term fishing. They were also asked “how does your income from fishing this year compare to what it was two years ago”. The results indicated that income at the time of the interview was lower than the previous two years. Those that did not belong to organizations or attend meetings reported their income between “lower” and “no change” and perceived themselves as less affected. This may indicate that those that participate in management meetings considered their livelihood more at risk than non-participants who felt less need to engage in the management process.

Sector membership was evaluated based on different types of participation, in relation to views on participation in the fishery management process, and the clarity of rules and regulations. A statistically significant difference was found between sector and non sector members who attend management meetings and the clarity of rules and regulations. Sector members found rules and regulations less clear than non sector members. When asked to describe advantages and disadvantages of sectors the most frequent responses were “not familiar” and “no opinion” suggesting that sector management regulations may have been poorly understood.

## 4 JOB SATISFACTION ANALYSES

### Job Satisfaction Across the Years

*Analysis* Differences between the three job satisfaction scales through time can be found in table 4.1. Table 4.1 clearly shows a drop in satisfaction with the items in the Basic Needs scale over the 33 year period, the sharpest drop between 1977 and 2007. The same sharp drop between 1977 and 2007 occurs with regard to the Social-Psychological Needs scale, but there appears to be a slight increase between 2007 and 2010. Analyses of the changes between 2007 and 2010 indicate that the changes are not statistically significant (Basic Needs  $t=0.529$ ,  $d.f.=156$ ,  $p=0.60$ ; Socio-Psychological  $t=0.579$ ,  $d.f.=157$ ,  $p=0.56$ ). Finally, there is no change in satisfaction with regard to Self-Actualization—the values are equally high across the years.

**Table 4.1. Changes in job satisfaction through the years.**

	Basic Needs	Social-Psychological	Self Actualization
1977	11.570	11.342	12.759
2007	9.440	10.000	12.800
2010	9.150	10.321	12.677
F-Ratio	28.562	5.539	0.074
d.f.	2 234	2 235	2 234
Probability	<0.001	0.004	0.929
d.f. varies due to missing data			

To determine if there are within gear differences with regard to changes in job satisfaction, we compared the values on the job satisfaction scales across the years 1977 and 2010 for lobster and dragger fishermen separately. The results of this analysis are in table 4.2. Table 4.2 clearly indicates greater changes among dragger fishermen than lobstermen.

Draggermen differ on 2 components and the lobstermen differ on only one. All significant differences reflect a decrease in job satisfaction, but the degree of decrease is greater among fishers who fish from dragger boats.

**Table 4.2 Job satisfaction changes through time by gear type.**

Lobster Pots							
Variable	Year	N	Mean	SD	t-value	d.f.	Prob.
Basic Needs	1977	24	11.542	1.841	3.608	89	0.001
	2010	67	9.612	2.374			
Social-psychological Needs	1977	24	11.792	1.668	0.983	89	0.328
	2010	67	11.269	2.403			
Self Actualization	1977	24	12.875	1.825	-0.406	89	0.686
	2010	67	13.045	1.736			
Dragger							
Variable	Year	N	Mean	SD	t-value	d.f.	Prob.
Basic Needs	1977	31	11.516	1.860	6.211	74	0.000
	2010	45	8.111	2.630			
Social-psychological Needs	1977	31	11.032	1.906	3.351	74	0.001
	2010	45	9.133	2.727			
Self Actualization	1977	31	12.871	1.628	1.309	74	0.194
	2010	45	12.200	2.510			

Turning to the questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over” we find a similar pattern—an expression of more negative responses as we move through the years. The analyses are presented in tables 4.3 through 4.6. With regard to advising a young person to fish, 77

percent said they would in 1977 in contrast to 24 and 37 percent in 2007 and 2010 respectively.

This result is statistically significant (table 4.3). The slight rise between 2007 and 2010 is not statistically significant ( $\chi^2=5.02$ , d.f=2, p=0.08). With regard to still becoming a fisherman if the respondent had his/her life to live over, we find a somewhat steadily declining percentage saying “yes” between 1977 and 2010, but the percentage is relatively high, indicating that most (almost 3/4ths in 2010) do not regret their choice of occupation. This result is also statistically significant, but the probability is suspect due to small cell values in the “maybe” category. This category was combined with the “yes” category and the distribution was reanalyzed (table 4.4). The results are similar and remain statistically significant ( $\chi^2 = 8.71$ , d.f=2, p=0.013).

Turning to analysis of the two questions within fishing type, the changes through time with respect to lobstermen who would advise a young person to go into fishing can be found in table 4.6. The analysis indicates that there has been a statistically significant drop in the percent willing to advise a young person to go into fishing, but the decrease is relatively small (about 16%).

Table 4.7 analyzes whether a lobsterman would be willing to become a fisherman again, and the results indicate no statistically significant differences in the responses over the years. The probabilities in table 4.7, however, are unreliable due to small cell sizes (the small proportion of fishermen replying “maybe”). The “yes” and “maybe” cells were merged and the revised analysis is in table 4.8, which also indicates no statistically significant change.

**Table 4.3. Percent distribution of advise young to fish across years.**

	1977	2007	2010	Total	N
No	7.595	76.000	54.015	41.079	99
Maybe	15.190	0.000	8.759	9.959	24
Yes	77.215	24.000	37.226	48.963	118
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>79</b>	<b>25</b>	<b>137</b>		<b>241</b>

$\chi^2 = 59.337$ , d.f=4, p<0.001

**Table 4.4. Percent distribution of willing to become a fisher again.**

	1977	2007	2010	Total	N
No	7.595	20.000	23.529	17.917	43
Maybe	6.329	0.000	2.941	3.750	9
Yes	86.076	80.000	73.529	78.333	188
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>79</b>	<b>25</b>	<b>136</b>		<b>240</b>

$\chi^2 = 10.74$ , d.f=4, p=0.030 (p unreliable)

**Table 4.5. Percent distribution of willing to become a fisher again.**

	1977	2007	2010	Total	N
No	7.595	20.000	23.529	17.917	43
Yes/Maybe	92.405	80.000	76.471	82.083	197
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>79</b>	<b>25</b>	<b>136</b>		<b>240</b>

$\chi^2 = 8.71$ , d.f=2, p=0.013

**Table 4.6 Percent distribution of advise young to fish across years (lobstermen)**

	1977	2010	Total	N
No	4.167	47.826	36.559	34
Maybe	29.167	11.594	16.129	15
Yes	66.667	40.580	47.312	44
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>24</b>	<b>69</b>		<b>93</b>

$\chi^2 = 15.254$ , d.f=2, p<0.001

**Table 4.7. Percent distribution of lobstermen willing to become a fisher again.**

	1977	2010	Total	N
No	4.167	18.841	15.054	14
Maybe	8.333	2.899	4.301	4
Yes	87.500	78.261	80.645	75
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>24</b>	<b>69</b>		<b>93</b>

$\chi^2 = 3.958$ , d.f=2, p=0.138 (unreliable)

Changes through time with respect to draggermen who would advise a young person to go into fishing can be found in table 4.9. The analysis indicates that there has been a statistically significant and relatively large decrease in the percent willing to advise a young person to go into fishing—a decrease of about 50 percent, from about 84 percent in 1977 to only 33 percent in 2010. The probabilities in table 4.9, however, are unreliable due to small cell sizes (the small proportion of fishermen replying “maybe”). The “yes” and “maybe” cells were merged and the revised analysis is in table 4.10, which also indicates a relatively large, statistically significant change—a drop of about 60 percent.

Table 4.11 analyzes whether a draggerman would be willing to become a fisherman again, and the results indicate a relatively small but statistically significant difference, a decrease in those who say they would. The probabilities in table 4.11, however, are unreliable due to small cell sizes (the small proportion of fishermen replying “maybe”). The “yes” and “maybe” cells were once again merged and the revised analysis is in table 4.12, which also indicates a small but statistically significant decrease.

*Attitudes towards regulations and job satisfaction through the years* The section above examined relationships between various individual variables and job satisfaction through the years. Now we examine relationships between attitudes toward management and job satisfaction. In 1977 and 2007 fishermen were asked their level of satisfaction with management officials on a scale of from 1 to 5 with 1=very dissatisfied and 5=very satisfied.

Mean values for this scale were 2.54 in 1977 dropping to 1.68 in 2007. This difference is statistically significant (Mann-Whitney U = 1522.5, p<0.001). Table 4.13 indicates that

**Table 4.8. Percent distribution of lobstermen willing to become a fisher again.**

	1977	2010	Total	N
No	4.167	18.841	15.054	14
Yes/Maybe	95.833	81.159	84.946	79
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>24</b>	<b>69</b>		<b>93</b>

$\chi^2 = 1.961$  (Yates corrected), d.f=1, p=0.161

**Table 4.9 Percent distribution of advise young to fish across years (draggermen)**

	1977	2010	Total	N
No	3.226	64.444	39.474	30
Maybe	12.903	2.222	6.579	5
Yes	83.871	33.333	53.947	41
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>31</b>	<b>45</b>		<b>76</b>

$\chi^2 = 29.300$ , d.f=2, p<0.001 (unreliable)

**Table 4.10 Percent distribution of advise young to fish across years (draggermen)**

	1977	2010	Total	N
No	3.226	64.444	39.474	30
Yes/Maybe	96.774	35.556	60.526	46
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>31</b>	<b>45</b>		<b>76</b>

$\chi^2 = 28.792$ , d.f=1, p<0.001

**Table 4.11. Percent distribution of draggermen willing to become a fisher again.**

	1977	2010	Total	N
No	6.452	26.667	18.421	14
Maybe	9.677	2.222	5.263	4
Yes	83.871	71.111	76.316	58
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>31</b>	<b>45</b>		<b>76</b>

$\chi^2 = 6.402$ , d.f=2, p=0.041 (unreliable)

**Table 4.12. Percent distribution of draggermen willing to become a fisher again.**

	1977	2010	Total	N
No	6.452	26.667	18.421	14
Yes/Maybe	93.548	73.333	81.579	62
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>31</b>	<b>45</b>		<b>76</b>

$\chi^2 = 4.991$ , d.f=1, p=0.025



satisfaction with management is positively correlated with both the Basic and Social-Psychological Needs scales. Turning to the questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over” we find that those who would advise a young person to become a fisherman score higher on the management performance scale than those who would not (mean = 2.47 and 1.92 respectively, Mann-Whitney U = 646,  $p < 0.01$ ). Responses to whether or not the respondent would go into fishing if they had their life to live over were not statistically significantly related to attitudes towards performance of management (means values for no=2.09 for yes=2.37,  $U=496$ ,  $p > 0.05$ ).

**Table 4.13. Correlation between attitudes towards management and job satisfaction (1977 & 2007).**

	Performance of Management
Basic Needs	0.386***
Social-psychological Needs	0.243*
Self Actualization	-0.138
*** $p < 0.001$ * $p < 0.05$ N=104	

### Factors influencing job satisfaction in the present

Turning to factors influencing levels of job satisfaction among fishermen in Rhode Island in the present, we first examine the influence of individual characteristics such as age, education, environmental ethic, years fishing experience, familial involvement in the occupation, and aspects of the individual’s participation in the occupation (e.g., crew status, gear type and target species). Following these analyses we examine relationships between the individual’s involvement in and perceptions of management and aspects of job satisfaction.

**Analysis** *Individual level variables and job satisfaction* Table 4.14 presents correlations between some of the individual level variables and the three job satisfaction scales. The analysis indicates only 3 statistically significant correlations ( $p < 0.05$ )—years fishing experience and age are negatively correlated with satisfaction on Basic Needs, and environmental ethic is positively correlated with Basic Needs.

**Table 4.14 Correlations between individual level variables and job satisfaction.**

	Basic Needs	Social-Psychological Needs	Self Actualization
Years Fishing	-0.258*	0.109	0.070
Generations Fishing	0.149	0.093	0.121
Family Fishing	0.071	-0.028	-0.099
Relatives Fishing	0.012	-0.095	0.072
Age	-0.202*	0.118	0.025
Education	0.027	0.181	0.119
Environmental Ethic	0.289**	-0.006	0.048
** $p < 0.01$ * $p < 0.05$ N= 130-134, varies due to missing data.			

Turning to the questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over” we find a similar pattern—only years fishing experience and age are related to the first question (table 4.15).

**Table 4.15. Relationships between individual level variables and the 2 job satisfaction questions.**

<b>Variable</b>	<b>Become a fisher again</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>t-value</b>
Years Fishing	No	36	23.250	13.287	-0.357
	Yes	102	24.186	13.623	
Generations Fishing	No	35	1.600	1.006	-0.849
	Yes	100	1.770	1.024	
Family Fishing	No	36	1.500	2.741	1.478
	Yes	101	0.980	1.341	
Age	No	36	42.806	11.992	-0.442
	Yes	101	43.911	13.163	
Education	No	35	12.914	1.792	-0.908
	Yes	100	13.265	2.022	
<b>Variable</b>	<b>Advise Young to fish</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>t-value</b>
Years Fishing	No	76	26.158	12.606	2.164*
	Yes	62	21.226	14.140	
Generations Fishing	No	74	1.595	0.935	-1.662
	Yes	61	1.885	1.097	
Family Fishing	No	75	1.120	1.979	0.023
	Yes	62	1.113	1.621	
Age	No	75	45.720	12.010	2.134*
	Yes	62	41.081	13.422	
Education	No	74	13.115	1.944	-0.384
	Yes	61	13.246	2.003	

\*p<0.05

Relationships between the 3 job satisfaction scales and crew position, gear type used and principal target species are found in table 4.16. Table 4.16 indicates that captains (includes captain-owners) are more satisfied with Basic Needs than crew. This is the only statically significant relationship between the 3 job satisfaction scales and crew status. All three of the job satisfaction scales are related to gear type. In this case the pattern is clear, lobstermen are overall more satisfied than draggermen. We find a similar pattern with regard to target species, with those focusing on lobster being more satisfied with regard to Basic and Social-psychological needs, with little discernable difference between the squid and groundfish fishers. Levels of self-actualization do not differ between the fishers of these three species classifications.

**Table 4.16. Relationships between crew status, gear used, target species and the 3 job satisfaction scales.**

Variable	Crew status	N	Mean	SD	t-value
Basic Needs	Captain	48	9.979	2.589	2.930**
	Crew	85	8.682	2.372	
Social-Psychological Needs	Captain	49	10.102	2.347	-0.726
	Crew	85	10.447	2.809	
Self Actualization	Captain	47	12.362	1.799	-1.333
	Crew	86	12.849	2.123	
Variable	Gear Type	N	Mean	SD	t-value
Basic Needs	Dragger	45	8.111	2.630	-3.140**
	Lobster Pots	67	9.612	2.374	
Social-Psychological Needs	Dragger	45	9.133	2.727	-4.366***
	Lobster Pots	67	11.269	2.403	
Self Actualization	Dragger	45	12.200	2.510	-2.107*
	Lobster Pots	67	13.045	1.736	
Variable	Target Species	N	Mean	SE	f-value
Basic Needs	Groundfish	16	8.500	0.621	4.547*
	Squid	29	8.000	0.461	
	Lobster	69	9.580	0.299	
Social-Psychological needs	Groundfish	16	9.125	0.622	9.810***
	Squid	29	9.138	0.462	
	Lobster	69	11.246	0.300	
Self Actualization	Groundfish	16	12.000	0.519	2.563
	Squid	29	12.138	0.386	
	Lobster	69	12.986	0.250	

\*p<0.05 \*\*p<0.01 \*\*\*p<0.001

Turning to the questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over” we find no statistically significant (alpha = 0.05) relationships with crew status, gear type and principal target species (tables 4.17-4.19).

**Table 4.17. Advise young to fish and enter the occupation again by crew status**

	Advise young to fish				Enter the occupation again			
	Captain	Crew	Total	N	Captain	Crew	Total	N
No	48.000	59.091	55.072	76	28.000	25.000	26.087	36
Yes	52.000	40.909	44.928	62	72.000	75.000	73.913	102
Total	100	100	100		100	100	100	
<b>N</b>	<b>50</b>	<b>88</b>		<b>138</b>	<b>50</b>	<b>88</b>		<b>138</b>

All p>0.05  $\chi^2$  test

**Table 4.18. Advise young to fish and enter the occupation again by gear type**

	Advise young to fish				Enter the occupation again			
	Dragger	Lobster Pots	Total	N	Dragger	Lobster Pots	Total	N
No	64.444	48.571	54.783	63	26.667	21.429	23.478	27
Yes	35.556	51.429	45.217	52	73.333	78.571	76.522	88
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>		<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>45.000</b>	<b>70.000</b>		<b>115</b>	<b>45</b>	<b>70</b>		<b>115</b>

All  $p > 0.05$   $\chi^2$  test

**Table 4.19. Advise young to fish and enter the occupation again by principal species.**

	Advise young to fish					Enter the occupation again				
	Groundfish	Squid	Lobster	Total	N	Groundfish	Squid	Lobster	Total	N
No	68.750	62.069	51.389	56.410	66	18.750	31.034	23.611	24.786	29
Yes	31.250	37.931	48.611	43.590	51	81.250	68.966	76.389	75.214	88
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>		<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	
<b>N</b>	<b>16</b>	<b>29</b>	<b>72</b>		<b>117</b>	<b>16</b>	<b>29</b>	<b>72</b>		<b>117</b>

All  $p > 0.05$   $\chi^2$  test

*Attitudes towards regulations and job satisfaction* The section above examined relationships between various individual variables and job satisfaction. Now we examine relationships between attitudes toward management and job satisfaction. Fishermen were asked which regulations most affected their 1) fishing activities, 2) family, and 3) income. For the analysis reported here, if a specific regulation were reported for any of these 3 impacts, the respondent was coded as indicating that specific regulation. Three types of regulations were mentioned by more than 20 percent of the respondents: 1) days at sea, 2) gear restrictions and 3) quotas. Another high frequency category (>20%) was a non-specific reply “all regulations”. Table 4.20 examines relationships between these responses and the three job satisfaction scales.

Table 4.20 indicates that the only response with statistically significant relationships with job satisfaction is the general “all regulations” response. Here we find that those who give this response score lower on both the Basic and Social-psychological needs scales.

**Table 4.20. Relationships between the 3 job satisfaction scales and regulations cited as affecting activities, family and/or income.**

Variable	Days at sea	N	Mean	SD	t-value
Basic Needs	No	104	9.231	2.626	0.695
	Yes	29	8.862	2.117	
Social-Psychological Needs	No	104	10.433	2.687	0.910
	Yes	30	9.933	2.504	
Self Actualization	No	103	12.583	2.126	0.996
	Yes	30	13.000	1.597	
Variable	Gear restrictions	N	Mean	SD	t-value
Basic Needs	No	88	9.114	2.507	0.234
	Yes	45	9.222	2.575	
Social-Psychological Needs	No	89	10.067	2.580	1.568
	Yes	45	10.822	2.733	
Self Actualization	No	88	12.500	2.150	1.415
	Yes	45	13.022	1.712	
Variable	Quotas	N	Mean	SD	t-value
Basic Needs	No	102	9.029	2.451	1.004
	Yes	31	9.548	2.743	
Social-Psychological Needs	No	103	10.563	2.667	1.952
	Yes	31	9.516	2.448	
Self Actualization	No	102	12.794	2.060	1.218
	Yes	31	12.290	1.865	
Variable	All Regulations	N	Mean	SD	t-value
Basic Needs	No	103	9.563	2.428	3.659***
	Yes	30	7.733	2.348	
Social-Psychological Needs	No	104	10.635	2.385	2.611*
	Yes	30	9.233	3.213	
Self Actualization	No	104	12.808	1.870	1.421
	Yes	29	12.207	2.470	
***p<0.001 *p<0.05					

Turning to the questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over”, percent distribution of responses to these job satisfaction questions and regulations mentioned as most impacting the respondent’s fishing activities, family and/or income are presented in tables 4.21 through 4.24. None of the distributions indicate a statistically significant relationship between these two questions and the fishermen’s perceptions of impacts of regulations.

**Table 4.21. Advise young to fish and enter the occupation again by days at sea (percent distribution)**

Days at sea	Advise young to fish				Enter the occupation again			
	No	Yes	Total	N	No	Yes	Total	N
<i>Not Mentioned</i>	53.271	46.729	100	107	26.168	73.832	100	107
<i>Mentioned</i>	61.290	38.710	100	31	25.806	74.194	100	31
<i>Total</i>	<b>55.072</b>	<b>44.928</b>	<b>100</b>		<b>26.087</b>	<b>73.913</b>	<b>100</b>	
<b>N</b>	<b>76</b>	<b>62</b>		<b>138</b>	<b>36</b>	<b>102</b>		<b>138</b>
All p>0.05 $\chi^2$ test								

**Table 4.22. Advise young to fish and enter the occupation again by gear restrictions (percent distribution)**

Gear restrictions	Advise young to fish				Enter the occupation again			
	No	Yes	Total	N	No	Yes	Total	N
<i>Not Mentioned</i>	55.556	44.444	100	90	28.889	71.111	100	90
<i>Mentioned</i>	54.167	45.833	100	48	20.833	79.167	100	48
<b>Total</b>	<b>55.072</b>	<b>44.928</b>	<b>100</b>		<b>26.087</b>	<b>73.913</b>	<b>100</b>	
<b>N</b>	<b>76</b>	<b>62</b>		<b>138</b>	<b>36</b>	<b>102</b>		<b>138</b>

All  $p > 0.05$   $\chi^2$  test

**Table 4.23. Advise young to fish and enter the occupation again by quotas (percent distribution)**

Quotas	Advise young to fish				Enter the occupation again			
	No	Yes	Total	N	No	Yes	Total	N
<i>Not Mentioned</i>	53.271	46.729	100	107	22.430	77.570	100.000	107.000
<i>Mentioned</i>	61.290	38.710	100	31	38.710	61.290	100.000	31.000
<b>Total</b>	<b>55.072</b>	<b>44.928</b>	<b>100</b>		<b>26.087</b>	<b>73.913</b>	<b>100.000</b>	
<b>N</b>	<b>76</b>	<b>62</b>		<b>138</b>	<b>36</b>	<b>102</b>		<b>138.000</b>

All  $p > 0.05$   $\chi^2$  test

**Table 4.24. Advise young to fish and enter the occupation again by all regulations (percent distribution)**

All regulations	Advise young to fish				Enter the occupation again			
	No	Yes	Total	N	No	Yes	Total	N
<i>Not Mentioned</i>	51.402	48.598	100	107	25.234	74.766	100	107
<i>Mentioned</i>	67.742	32.258	100	31	29.032	70.968	100	31
<b>Total</b>	<b>55.072</b>	<b>44.928</b>	<b>100</b>		<b>26.087</b>	<b>73.913</b>	<b>100</b>	
<b>N</b>	<b>76.000</b>	<b>62.000</b>		<b>138</b>	<b>36.000</b>	<b>102.000</b>		<b>138.000</b>

All  $p > 0.05$   $\chi^2$  test

Next we turn to examining relationships between job satisfaction and 1) the degree to which the respondent feels that his/her participation in public meetings makes a difference, 2) the degree to which the respondent feels that the meetings have any influence on management and 3) the degree to which the management rules are perceived as being clear. Correlations between the 3 job satisfaction scales and responses to these questions can be found in table 4.25.

**Table 4.25 Correlations between job satisfaction and attitudes towards management.**

	Basic Needs	Social-Psych Needs	Self Actualize
Participation Makes a Difference	0.115	0.172	0.109
Meetings Influence Management	0.230*	0.158	0.169
Regulations are Clear	0.279**	0.348***	0.123

\*\*\* $p < 0.001$  \*\* $p < 0.01$  \* $p < 0.05$

Table 4.25 indicates that there are statistically significant positive correlations between the degree to which the respondent perceives the regulations as being clear and satisfaction with both the Basic and Social-Psychological Needs scales. There is also a statistically significant correlation between perceptions that meetings influence management decisions and satisfaction with Basic Needs.

	Advise young to fish				Enter the occupation again			
	No	Yes	U-score	N	No	Yes	U-score	N
Participation Makes a Difference	2.7	3.1	283	136	2.9	2.9	119*	136
Meetings Influence Management	1.6	2.7	962**	65	1.0	2.4	665**	65
Regulations are Clear	1.6	2.7	1948	105	1.2	2.4	1703	105

\*\*p<0.01 \*p<0.05

Table 4.26 presents the analysis of relationships between these three perceptions of management variables and responses to the questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over”. The analysis indicates that those who would advise a young person to enter the occupation of fishing feel more strongly that public meetings have an influence on management, and that those who would enter the occupation again if they had their lives to line over feel more strongly that participation in public meetings makes a difference and that these meetings have an influence on management.

### Summary of Analyses of Job Satisfaction

The analyses clearly shows a drop in satisfaction with the items in the Basic and Social-Psychological Needs scales over the 33 year period (1977-2010), with greater changes among dragger fishermen than lobstermen. Draggermen differ on 2 components (basic, social-psychological) and the lobstermen differ on only one (basic). There are no statistically significant differences with regard to the Self-actualization scale.

With regard to advising a young person to fish over 3/4ths said they would in 1977 in contrast to a little over one third 2010 . This result is statistically significant. With regard to still becoming a fisherman is the respondent had his/her life to live over, we find a somewhat steadily declining percentage saying “yes” between 1977 and 2010, but the percentage is relatively high, indicating that most (almost 3/4ths in 2010) do not regret their choice of occupation.

The analysis, however, indicates that there has been a statistically significant and relatively large decrease in the percent of draggermen willing to advise a young person to go into fishing. The analysis also indicates a relatively small but statistically significant decrease in the percent of draggerman would be willing to become a fisherman again through the 33 year time period. With respect to lobstermen who would advise a young person to go into fishing the analysis indicates that there has been a statistically significant drop in the percent willing to advise a young person to go into fishing, but the decrease is relatively

small (about 16%). In terms of whether a lobsterman would be willing to become a fisherman again, and the results indicate no statistically significant differences in the responses over the years.

Satisfaction with management in 1977 and 2007 is positively correlated with both the Basic and Social-Psychological Needs scales. Turning to the questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over” we find that those who would advise a young person to become a fisherman score higher on the management performance scale than those who would not. Responses to whether or not the respondent would go into fishing if they had their life to live over were not statistically significantly related to attitudes towards performance of management in the 1977 and 2007 time periods.

Turning to the analyses of the 2010 data, the analyses relating individual level variables and the three job satisfaction scales indicates only that years fishing experience and age are negatively correlated with satisfaction on Basic needs. Turning to the questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over” we find a similar pattern—only years fishing experience and age are related to the first question.

We also find that captains (includes captain-owners) are more satisfied with Basic needs than crew. This is the only statically significant relationship between the 3 job satisfaction scales and crew status. All three of the job satisfaction scales are related to gear type. In this case the pattern is clear, lobstermen are overall more satisfied than draggermen. We find a similar pattern with regard to target species, with those focusing on lobster being more satisfied with regard to Basic and Social-psychological needs, with little discernable difference between the squid and groundfish fishers. Levels of Self-actualization do not differ between the fishers of these three species classifications. Turning to the questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over” we find no statistically significant relationships with crew status, gear type and principal target species

With regard to regulations that impact fishing activities, family and income, we find that those who give the general “all regulations” response score lower on both the Basic and Social-psychological needs scales. The questions “would you advise a young person to go into fishing” and “would you still fish if you had your life to live over”, are found to be unrelated to the fishermen’s perceptions of impacts of regulations.

There are, however, statistically significant positive correlations between the degree to which the respondent perceives the regulations as being clear and satisfaction with both the Basic and Social-Psychological Needs scales. There is also a statistically significant positive correlation between perceptions that meetings influence management decisions and satisfaction with Basic Needs. Finally, those who would advise a young person to enter the occupation of fishing feel more strongly that public meetings have an influence on management, and those who would enter the occupation again if they had their lives to live



over feel more strongly that participation in public meetings makes a difference and that these meetings have an influence on management.

## 5 WELL BEING ANALYSIS

*Analysis* Table 5.1 presents correlations between individual attributes, attitudes towards management and the environmental and individual well-being scales. The analysis indicates that lobster fishers (as opposed to draggersmen), fishers who feel impacted by sex/size regulations and those that feel that participation in public meetings concerning fishery management have higher levels of individual well-being. In contrast, fishermen who report being impacted by all regulations and who have more immediate family involved in the fishery report lower levels of well-being. None of the variables are statistically significantly correlated with the environmental well-being scale.

**Table 5.1. Correlations between individual attributes, attitudes toward management & well-being indices.**

	Well-being Index	Environmental Well-being
Lobster Fishermen	0.309**	0.019
Days at Sea Regulations	-0.035	0.015
Gear Restrictions	0.096	0.075
Sex/Size Restrictions	0.172*	0.126
Quotas	-0.095	0.034
Groundfish Regulations	0.084	0.052
All Regulations	-0.211*	-0.121
Sector Member	-0.026	0.084
Years Fishing	0.052	0.079
Generations Fishing	0.006	0.097
Family Fishing	-0.177*	0.044
Relatives Fishing	-0.093	0.090
Age	0.062	0.022
Education	0.093	0.019
Participation Makes a Difference	0.305*	-0.140
Meetings Influence Management	0.089	-0.159
Crew Status	0.045	-0.021
**p<0.01 *p<0.05		

Turning to relationships between job satisfaction and individual and environmental well-being, table 5.2 indicates that all five measures are significantly and relatively strongly positively correlated with individual well-being. As the scores on the Basic Needs, Social-Psychological Needs and Self Actualization scales increase, so do reports of individual well being. Additionally, those who say they would advise a young person to enter the occupation and also report that they would enter the occupation if they had their lives to live over also report higher levels of individual well-being. The only job satisfaction indicator statistically significantly related to environmental well-being is the Basic Needs scale.

**Table 5.2. Correlations between job satisfaction scales and well-being indices.**

	Well-being Index	Environmental Well-being
Basic Needs	0.394***	0.189*
Social-Psychological Needs	0.554***	0.003
Self Actualization	0.398***	-0.132
Advise Young to Fish	0.206*	0.058
Fish Again	0.367***	0.085
***p<0.001 **p<0.01 *p<0.05		

The sample of those who left fishing is relatively small (N=15) with an older average age (mean 52.4, range 27 to 81) than current fishermen (mean=43.6); hence, the following analysis should be viewed with these limitations in mind. The ex-fishermen were asked the same job satisfaction and well-being questions. The job satisfaction questions, however,

were qualified by asking each question for level of satisfaction both while fishing and in current occupation. Hence, we are able to create a degree of change variable for each of the job satisfaction scales. Table 5.3 examines differences between job satisfaction levels reported for fishing and non-fishing phases of the respondents' careers. Table 5.3 indicates statistically significant increases in the Social-Psychological and decreases in the Self Actualization scales.

**Table 5.3. Paired sample comparisons of job satisfaction scales during fishing and non-fishing phases of non-current fishermen.**

Variable	Phase	N	Mean	t-value
Basic	Fishing	12	11.417	0.449
	Non-Fishing		11.750	
Social-Psychological	Fishing	13	10.000	3.811**
	Non-Fishing		12.538	
Self-Actualize	Fishing	13	12.846	2.843*
	Non-Fishing		11.385	

\*\*p<0.01 \*p<0.05

The increase in satisfaction on the Social-Psychological scale can be explained by the fact that the non-fishing occupations are less physically demanding and allow for more time at home. The non-fishing occupations also provide less adventure, challenge and independence than fishing; hence, fishers report lower levels of Self Actualization.

How are these differences related to individual well being? Correlations between degree of change in levels of satisfaction (non-fishing levels minus fishing levels) and individual well-being are in table 5.4. Table 5.4 indicates that change in Self Actualization manifests the only statistically significant correlation. This correlation also indicates a large effect size. Since the average change between the fishing and non-fishing phases for Self Actualization is a minus 1.46 (range from minus 4 to plus 2), this relatively strong correlation indicates that with less of a negative change there are higher levels of well being, just as our hypothesis would predict.

**Table 5.4. Correlations between change in job satisfaction levels and individual well being.**

	Well-being
Change in Basic Needs	-0.105
Change in Social-Psychological Needs	0.008
Change in Self Actualization	0.517*

\*p<0.05 (1-tail test)

## 6. DISCUSSION AND RECOMMENDATIONS

**Perceptions of Management** The differences in opinion found between those that think participation makes a difference (25%) and those that think participation does not make a difference (75%) may indicate problematic social relationships and inadequate communication between the fishing community and management officials. M. Estelle Smith, who conducted research on participation and communication during the formative stages of the Regional Fisheries Management Councils in the late 1970s, reported similar skepticism among involved fishermen and related it to differences in attitudes, beliefs and values of participants and various procedural issues. She admitted the complexity of the issues involved and called for further research (Smith 1982). It appears we have not improved the situation much in the past 35 years and perhaps should follow Smith's recommendation for further research.

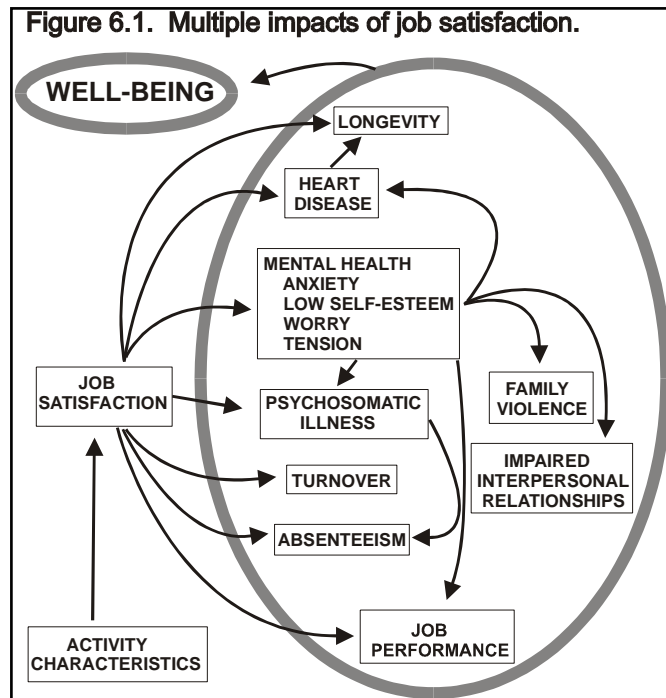
Continuing with an issue related to communication problems, the extent to which regulations were considered clear and straightforward was evaluated in relation to fishery and gear type. These relationships were found to be significant, indicating that some find management rules and regulations unclear. This was most significant amongst groundfishermen. Outreach efforts aimed at facilitating greater understanding of rules and regulations may improve this. Views on participation were uniformly low showing a lack of confidence in the management process. Involvement early in the management process would make it possible to more effectively incorporate concerns in social impact assessments.

Finally, our findings, that a significant number of fishermen reported that "all" rather than specific regulations have had the greatest impact on families, presents a challenge for the conduct of social impact assessment. Management plans are generally species specific, each fishery managed separately, making it difficult to evaluate cumulative impacts that are felt by those fishermen, and their families, who harvest more than one species. Further, although a specific management measure may be the final one to result in a fisherman leaving the industry to seek other work; it is the long term adaptation to multiple management measures that is the real culprit.

**Management, Job Satisfaction and Individual Well Being** The analysis makes it clear that the general hypothesis relating management to job satisfaction and individual well being is supported by the data. The proliferation of regulations imposed on the Rhode Island fishermen after the 1970s depressed levels of job satisfaction on two of its three components (Basic and Social-Psychological Needs) subsequently lowering levels of subjective well-being. The only component of job satisfaction unaffected by increasing regulation of fishermen was Self Actualization as predicted by our hypotheses. Decreased levels of job satisfaction are not a trivial matter. A great deal of research (Pollnac, et al 2008; Martin & Miller 1986; Hollinger & Clark 1982; Strauss 1979; Inkson 1978; Jacobs and Solomon 1977; Srivastva et al. 1975; Gelles 1974; HEW 1973; Martin and Miller 1986; Hollinger and Clark 1982; Palmore 1969; Robinson, Athanisou, and Head 1969; Kornhauser 1965) has linked job satisfaction to a host of important variables ranging from psychosomatic illness to longevity and family violence (figure 6.1 adopted from Pollnac, et

al 2008). Hence, management has had truly negative impacts on the fishermen of Rhode Island. It is fortunate that management has not impacted the most important component of job satisfaction, self-actualization (Pollnac et al 2011, Pollnac and Poggie 2008).

Pollnac and Poggie (2008), based on their own research and a comprehensive review of the literature, argue that the self actualization component of the occupation of fishing is a satisfaction that keeps fishermen fishing even as income decreases. Interestingly, if we dichotomize the sample at the sample mode for Basic Needs (mode = 9), the only job satisfaction scale statistically significantly related to advising a young person to go into the fishery is Self Actualization ( $r=0.30$ ,  $p<0.05$ ,  $N= 56$ ).



It seems that only if fishermen leave the occupation will we find changes in self-actualization. We could only find a very small sample of individuals from Rhode Island who left the fishery (one knowledgeable fisherman that the only way people leave the occupation of fishing is in a pine box), and the data analysis clearly indicates a significant decrease in Self Actualization. As our hypothesis predicted, the analysis indicated that the larger the degree of negative change, the lower the level of individual well-being.

Some alternatives to fishing, however, may provide comparable levels of Self Actualization. Just by chance, Pollnac met a fisherman (in a doctor's office) who quit lobstering and became a fireman. He said that being a fireman is a lot like fishing—when the alarm goes off, you never know what's going to happen; when the engine takes off from the fire station, he reported the same adrenalin rush that occurs going out on a fishing trip. But, how many available alternative occupations provide the same or similar "self actualization" challenges as fishing? Pollnac and Poggie (2008) argue that there are not many, and those that exist could not absorb a large input from the fishery. The job dissatisfaction that would result among those forced out of the fishery would result in the negative health, social and psychological impacts indicated in figure 6.1 to the detriment of the fishing community.

In sum, we have demonstrated significant relationships between management, job satisfaction and well-being; thus, providing support for the model of non-economic social impact assessment (NESIA) developed by Pollnac and his colleagues (Pollnac, et al. 2008).

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**APPENDIX I**

**SURVEY FORM**

**WELL-BEING, JOB SATISFACTION, AND CHANGE IN NORTHEAST FISHING COMMUNITIES**

Interviewer: \_\_\_\_\_ Date: \_\_\_\_\_

<b>Section A: Demographic information</b>
---

1. Location of interview: \_\_\_\_\_
2. Town/city of residence of interviewee: \_\_\_\_\_
- 3a. Do you own a commercial fishing vessel?  Yes  No **(Go to 4)**    3b. Number of vessels: \_\_\_\_

If number of vessels does not exceed 2:

3c. Vessel Type	3d. Vessel Length

<b>Use the table below to answer questions 4a and 5a.</b>
---

- 4a. What is your principal fishing type (target species)?
- 4b. What gear do you use? \_\_\_\_\_
- 5a. What other types of fishing do you conduct (target species)?
- 5b. What gear do you use? \_\_\_\_\_

Target Species	Principle Fishing Type (4a)	Other Fishing Type(s) (5a)
Black Sea Bass	<input type="checkbox"/>	<input type="checkbox"/>
Bluefish	<input type="checkbox"/>	<input type="checkbox"/>
Butterfish	<input type="checkbox"/>	<input type="checkbox"/>
Dogfish	<input type="checkbox"/>	<input type="checkbox"/>
Herring	<input type="checkbox"/>	<input type="checkbox"/>
Large Mesh Groundfish	<input type="checkbox"/>	<input type="checkbox"/>
Lobster	<input type="checkbox"/>	<input type="checkbox"/>
Mackerel	<input type="checkbox"/>	<input type="checkbox"/>
Monkfish	<input type="checkbox"/>	<input type="checkbox"/>
Ocean Quahog	<input type="checkbox"/>	<input type="checkbox"/>
Red Crab	<input type="checkbox"/>	<input type="checkbox"/>
Scallop	<input type="checkbox"/>	<input type="checkbox"/>
Scup	<input type="checkbox"/>	<input type="checkbox"/>
Small Mesh Groundfish	<input type="checkbox"/>	<input type="checkbox"/>
Squid	<input type="checkbox"/>	<input type="checkbox"/>
Whiting/Hake	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>

6. In terms of income, which fishery was the most important for you in the past year? \_\_\_\_\_

7. Primary port of landing (in terms of frequency or the most recently used): \_\_\_\_\_

8. Homeport: \_\_\_\_\_

9. Do you have any occupation(s) in addition to fishing?  Yes  No (Go to 11)

10. Rank these activities (including fishing as one activity) in terms of importance to your income:

Occupations	Rank

11. What is your current position in the fishery/on the boat?

Position	Check One
Non-fishing owner (shore captain)	<input type="checkbox"/>
Captain/Owner	<input type="checkbox"/>
Captain	<input type="checkbox"/>
Crew	<input type="checkbox"/>

**Only vessel owners, captains or captain/owners answer question 12. If not go to 13.**

<i>Very difficult</i>	<i>Difficult</i>	<i>No change</i>	<i>Easy</i>	<i>Very easy</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

13. What is/was your average crew size?

(13a.) Today	(13b.) Two years ago	(13c.) Two years from now

14. How many years of commercial fishing experience do you have? \_\_\_\_\_

15. How many generations of your family have fished? (Including interviewee as a generation) \_\_\_\_\_

16. Number of immediate family members involved in fishing? (e.g.: parents, siblings, kids) \_\_\_\_\_

17. Number of other relations involved in fishing? (e.g.: grandparents, uncles, aunts, cousins, brothers/sisters in law, etc.) \_\_\_\_\_

18. Is the current level of income from your fishing business enough for you to see yourself still fishing in the short term, medium term, or long term?

<i>Short Term</i>	<i>Medium Term</i>	<i>Long Term</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

19. How does your income from fishing this year compare to what it was two years ago?

<i>Much lower</i>	<i>Lower</i>	<i>No change</i>	<i>Higher</i>	<i>Much higher</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

20. How old are you? \_\_\_\_\_

21. How many years of formal education do you have? \_\_\_\_\_

## Section B: Participation

1. Do you belong to any type of fishermen's organization?  Yes  No
2. Do you attend any public meetings where fishery management issues are discussed (e.g., Regional Council, Department of Environmental Management, etc.)?  Yes  No **(Go to 6)**
3. Do you urge others to attend the meetings?  Yes  No
4. Do you talk at the meeting, present ideas, debate issues, etc.?  Yes  No
5. Do you feel your participation makes any difference?

No difference 0\_\_ 1\_\_ 2\_\_ 3\_\_ 4\_\_ 5\_\_ 6\_\_ Big difference

**All interviewees answer question 6! Regardless of attendance to meetings or not.**

6. Do you feel that the meetings have any influence on the management plans developed?

No difference 0\_\_ 1\_\_ 2\_\_ 3\_\_ 4\_\_ 5\_\_ 6\_\_ Big difference

7. Do you use internet to obtain information about the fishery or fishery management?  Yes  No
8. Do you read any publications related to fisheries?  Yes  No

Notes

## Section C: Management

1. What regulations have most affected your fishing activity? How?

Regulation(s)	Effects

2. What regulations have had the greatest impact on families? How?

Regulation(s)	Effects

3. What regulations affect income the most? How?

Regulation(s)	Effects

4. Are the rules and regulations that affect your fishing activities clear and straightforward?

<i>Very unclear</i>	<i>Unclear</i>	<i>Neutral</i>	<i>Clear</i>	<i>Very clear</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

Notes

## Section D: Catch Shares Perspectives

1. Do you belong to a sector?  Yes  No

**All interviewees answer question 2 and 3 regardless of them belonging to a sector or not.**

2. What are the advantages of belonging to a sector?

Answer:

3. What are the disadvantages of belonging to a sector?

Answer:

Notes

## Section E: Performance Measures

1. On a scale of 1 to 10, how important is it for people to benefit equally from the catch shares system?

Not important 1\_\_ 2\_\_ 3\_\_ 4\_\_ 5\_\_ 6\_\_ 7\_\_ 8\_\_ 9\_\_ 10\_\_ Very important

2. On a scale of 1 to 10, how important is the financial status of the fishery?

Not important 1\_\_ 2\_\_ 3\_\_ 4\_\_ 5\_\_ 6\_\_ 7\_\_ 8\_\_ 9\_\_ 10\_\_ Very important

3. On a scale of 1 to 10, how important is it that workers in the fishery participate in the fisheries management process?

Not important 1\_\_ 2\_\_ 3\_\_ 4\_\_ 5\_\_ 6\_\_ 7\_\_ 8\_\_ 9\_\_ 10\_\_ Very important

4. On a scale of 1 to 10, how important is it that fishermen use the resource in a careful and responsible way?

Not important 1\_\_ 2\_\_ 3\_\_ 4\_\_ 5\_\_ 6\_\_ 7\_\_ 8\_\_ 9\_\_ 10\_\_ Very important

5. On a scale of 1 to 10, how important is the well-being of participants in the fishery?

Not important 1\_\_ 2\_\_ 3\_\_ 4\_\_ 5\_\_ 6\_\_ 7\_\_ 8\_\_ 9\_\_ 10\_\_ Very important

Notes

## Section F: Environmental Ethics, Job Satisfaction and Well-Being

### Environmental Ethics:

Ask if the person interviewed agrees, disagrees or neither with regard to each question. If agree or disagree, ask if they strongly agree/disagree, just agree/disagree or agree/disagree a little.

**1. There are way too many fishermen in the sea.**

<i>Strongly disagree</i>	<i>Disagree</i>	<i>Disagree a Little</i>	<i>Neutral</i>	<i>Agree a Little</i>	<i>Agree</i>	<i>Strongly agree</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>

**2. Today's fishing practices are not enough to hurt nature.**

<i>Strongly disagree</i>	<i>Disagree</i>	<i>Disagree a Little</i>	<i>Neutral</i>	<i>Agree a Little</i>	<i>Agree</i>	<i>Strongly agree</i>
7 <input type="checkbox"/>	6 <input type="checkbox"/>	5 <input type="checkbox"/>	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>

**3. The so-called over fishing of the oceans is exaggerated.**

<i>Strongly disagree</i>	<i>Disagree</i>	<i>Disagree a Little</i>	<i>Neutral</i>	<i>Agree a Little</i>	<i>Agree</i>	<i>Strongly agree</i>
7 <input type="checkbox"/>	6 <input type="checkbox"/>	5 <input type="checkbox"/>	4 <input type="checkbox"/>	3 <input type="checkbox"/>	2 <input type="checkbox"/>	1 <input type="checkbox"/>

**Job Satisfaction:**

Ask if the person interviewed is satisfied, dissatisfied or neither with regard to each question. If satisfied or dissatisfied, ask if they are very satisfied/dissatisfied or just satisfied/dissatisfied.

How satisfied are you with...

**1. Your actual earnings?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**2. Time spent away from home?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**3. Predictability of your earnings?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**4. Job safety?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**5. Adventure of the job?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**6. Physical fatigue of the job?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**7. Opportunity to be your own boss?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**8. Challenge of the job?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**9. Healthfulness of the job?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
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1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
----------------------------	----------------------------	----------------------------	----------------------------	----------------------------

10a. Would you advise a young person to enter fishing?  Yes  No

10b. Why?

11a. Would you still fish if you had your life to live over?  Yes  No

11b. Why?

**Well-being:**

**12. How satisfied are you with the overall health of the marine environment (for example pollution, fish stocks, etc)?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**13. In general, how satisfied are you with your life?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**14. How satisfied are you with your physical health?**

<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Neutral</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

**15. How often do you feel happy?**

<i>Never</i>	<i>Not often</i>	<i>Neutral</i>	<i>Often</i>	<i>All the time</i>
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>

12a. In the unlikely event that you could no longer fish, what kind of a job would you like to have?

\_\_\_\_\_

12b. Would you need additional training to get this type of job?  Yes  No