

Unclassified

AGR/FI(2000)8/FINAL



Organisation de Coopération et de Développement Economiques
Organisation for Economic Co-operation and Development

OLIS : 03-Oct-2000
Dist. : 04-Oct-2000

Or. Eng.

PARIS

DIRECTORATE FOR FOOD, AGRICULTURE AND FISHERIES
FISHERIES COMMITTEE

AGR/FI(2000)8/FINAL
Unclassified

TRANSITION TO RESPONSIBLE FISHERIES

**FISHERIES LABOUR AND ADJUSTMENT TO RESPONSIBLE FISHERIES:
CASE STUDIES**

96094

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FISHERIES LABOUR AND ADJUSTMENT TO RESPONSIBLE FISHERIES

CASE STUDIES

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FOREWORD

The Committee for Fisheries decided in 1997 to embark on a major study of the economic and policy implications associated with a move to responsible fisheries. Entitled *Transition to Responsible Fisheries – Economic and Policy Implications* the Study covers four distinct areas of work:

- Fisheries Labour and Adjustment to Responsible Fisheries
- Post-Harvesting Practices and Responsible Fisheries
- Government Financial Transfers and Resource Sustainability
- Modelling the Transition to Responsible Fisheries

In carrying out this Study the Committee relied to a large extent on the submission of country case studies and special studies. Separate volumes containing this material have been published for each of the four areas of work. The documents are also available on the OECD fisheries web site (www.oecd.org/agr/fish). The papers contained in this volume were submitted as case studies for the part of the transition study dealing with Fisheries Labour and Adjustment to Responsible Fisheries.

When finalising its Study in March 2000, the Committee for Fisheries decided to make the material available to the public. The main Study — in the form of four synthesis reports and a Statement adopted by the Committee for Fisheries — is available as an OECD publication for sale entitled *Transition to Responsible Fisheries – Economic and Policy Implications* (OECD, 2000).

TABLE OF CONTENTS

CANADA 5
KOREA 41
SPAIN..... 53
NEW ENGLAND AND THE MID-ATLANTIC REGIONS 65

CANADA

Pacific Salmon Revitalisation Strategy Case Study on the Socio- Impacts of Moving to more Responsible Fisheries: A Canadian Contribution to the OECD

Prepared by: Dianne Carbonetti, Economic Policy & Analysis Branch
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 September 1997

I. Executive Summary

In an effort to ensure conservation, resource sustainability and the economic viability of the Pacific salmon industry, the Federal Department of Fisheries & Oceans Canada (DFO) launched the Pacific Salmon Revitalisation Strategy (PSRS), in March 1996. The PSRS was primarily designed to address the conservation threat posed by fleet overcapacity in the Pacific commercial salmon fishery, which puts the resource at serious risk. The PSRS includes the following key elements:

- A new fisheries management philosophy embracing **conservation through risk averse management**.
- A voluntary licence retirement programme.
- **New licensing measures** including single gear licensing, area licensing and licence “stacking.”

Single Gear Licensing - restricts fishers to one gear type

Area Licensing - restricts fishers to one specific fishing area according to gear type

Licence “Stacking” - allows fishers to acquire an additional licence(s) from another licence holder, thereby allowing the use of additional gear types and the ability to fish other areas

- **New institutional arrangements** encouraging DFO-Industry partnering and increased industry involvement in fisheries management.
- **A review of intersectoral allocations** examining the complex issue of salmon sharing arrangements between sectors.
- **Transition measures** such as the option to refrain from fishing in 1996, thereby delaying selection of a fishing area until the following year.

In conjunction with the PSRS, a fleet reduction target of 50% over several years was established. To date, the PSRS has achieved 32% of the targeted 50% reduction to the fleet, through the licence retirement and licence stacking measures.

The coastal communities of British Columbia are particularly dependent upon the pacific salmon fishery for employment and income. The majority of jobs in the pacific salmon industry are located in coastal communities many of them isolated or aboriginal. The lack of alternate employment opportunities in these coastal communities increases the significance of fishing income for survival.

Upperbound estimates indicate that the implementation of the PSRS resulted in the loss of 2 895 permanent jobs including 2 750 from the fleet and 145 from the supply sector. Due to the minimal effects on total fish harvested, the fleet reductions resulting from the PSRS have had no major impacts on either the processing or transport and handling sectors.¹ However, there continues to be significant debate surrounding the share and degree of impacts resulting from the poor salmon seasons versus the implementation of the PSRS. For the purpose of this case study, the socio-economic impacts are expressed based on the perceived impact of the PSRS only.

The loss of 1 173 skipper positions and 1 577 deckhand positions in the harvesting sector, represents a 26% decrease in the number of fleet salmon jobs overall. In terms of earnings, the PSRS introduced a risk factor due to the cyclical nature of the salmon fishery and the inability of fishers to retreat to other areas during the low cycle. Therefore, on average under area licensing, single licence holders will experience higher net incomes; however, they will also face greater year to year risk and variability in earnings.

Licensing measures also indirectly affected employment and income. As a result of the single gear and area licensing measures, fishers found themselves in possession of gear, which had been rendered redundant. Some fishers perceived the stacking measure as an option only available to the wealthy or to large corporations.

Overall, the implementation of the PSRS has resulted in an increase in the market value of fishing enterprises due to the higher income potential and the expanded market for licences. Crewmembers have experienced an increase in income as total crew earnings are now distributed among a decreased number of crewmembers. Furthermore, fish are being harvested at a lower overall cost, as the remaining vessels are able to harvest more fish at roughly the same operating cost. This resulted in an increase of CAD 21 million in net income in 1996.

The PSRS has also had favourable impacts for many of the fishers who left the industry. The licence retirement and licence stacking measures have provided relief to those experiencing financial difficulty in that a new market for licences has been created and the licensing measures have afforded those with heavy debtloads, an opportunity to pay down their debt. In many cases, the alternative for these individuals was bankruptcy. The licensing measures have also provided the required financial resources for those interested in pursuing retraining and/or employment in other industries. Finally, for those nearing retirement age, the licence retirement programme provided them with the option to sell their licence and retire with dignity.

Predictably, the non-harvesting sector was not significantly affected by the PSRS. The transport and handling sector has not experienced any impacts other than increased competition for existing jobs

¹. It should be noted that significant fluctuations in salmon landings affect both the processing and transport and handling sectors on an annual basis.

from displaced salmon workers. Likewise, the processing sector has not experienced any impacts as a direct result of the PSRS. Processing companies held one-third of all seine licences prior to the PSRS, and that figure has remained constant to the present time. The supply sector, however, has experienced a loss of 145 jobs from a total employment base of 615 supply jobs. These job losses are attributable to fleet reductions which resulted in a decrease in the number of vessels requiring outfitting.

Due to their heavy dependence on commercial fishing, some coastal communities were severely affected by job losses in the salmon fishery. This impact was concentrated in fifteen communities. When expressed as a percentage of community employment, fleet job loss in these communities ranged from 3% to as high as 46%.

Finally, in any situation implying job loss, there are social and psychological implications for the individuals affected, including family members. These impacts are mitigated to some extent due to the fact that the PSRS provides fishers with choices and options in how they will adapt to the changes in the salmon fishery. Furthermore, supplemental programmes for displaced fishery workers have been implemented in response to major areas of concern.

In response to the substantial changes introduced by the PSRS and the rapid implementation of these changes, an independent Federal-Provincial Review Panel was formed to review the impacts of the PSRS on individuals and communities. In response to the recommendations submitted by the Review Panel, the Federal Government announced that funding in the amount of CAD 35.7 million would be provided in support of appropriate adjustment measures. The introduction of structural adjustment programmes has assisted in successfully addressing key areas of concern identified by the Review Panel and the Pacific salmon fishing industry as a whole. Perhaps most importantly, the strengthening of federal-provincial and DFO-Industry partnerships aimed at moving to a more responsible fishery through improved conservation and management of the resource, provides a promising future for a robust and economically viable Pacific salmon fishery.

II. Introduction

The Fisheries Committee of the Organisation for Economic Co-operation and Development (OECD) has decided to examine global fishery concerns related to the transition to a more responsible fisheries management approach. To this end, the Committee has commissioned a study which examines those fisheries successfully having made the transition or which are in the process of making the transition to responsible fisheries management. One component of the OECD study includes an investigation into the socio-economic implications of moving to a more responsible fishery. In terms of methodology for compiling the required information for this component of the study, member countries have been requested to submit case studies for selected fisheries. Consequently, the Department of Fisheries & Oceans Canada has selected the Pacific Salmon Revitalisation Strategy as the subject for the case study on the socio-economic implications of moving to a more responsible fishery.

The Canadian Pacific salmon fishery provides a valued source of food, commerce and recreation to various stakeholders. The fishery is located along the coastal and inland waters of the province of British Columbia, Canada and is comprised of the sockeye, pink, chum, chinook and coho salmon species. All species are harvested in Canadian waters, extending from the Strait of Juan de Fuca, northwards to the Alaska, USA boundary.² There are three major sectors comprising the Pacific salmon fishery, namely the aboriginal, commercial and recreational sectors. Relative volume share of salmon for each of the three

² See Appendix A for geographical representation of Pacific Salmon fishery boundaries.

sectors is 92% for the commercial sector and 4% for each of the aboriginal and recreational sectors. All three sectors share a common commitment to resource conservation, while at the same time, embracing fundamentally different interests.

Of particular significance is the cyclical nature of the salmon fishery both in terms of harvests and prices, *i.e.*, good years followed by poor years.³ In recent years, the negative implications of the cycle have been exacerbated by unprecedented back to back poor harvesting seasons in 1995 and 1996, coupled with world market influences. In 1995 and 1996, Pacific salmon harvests were the lowest of any two year period in the last 35 years. In addition, world market influences including capture fisheries and salmon farming, have increased competition and adversely affected salmon prices for the long term.⁴ This increased supply from farms and overseas, has led to a dramatic reduction in salmon prices, such that real Pacific salmon prices (*i.e.* adjusted for inflation) have been reduced to one half of their value in 1988. During this same period, the entire commercial salmon industry has experienced a drop in revenues by as much as 50% compared to the average from 1991 to 1994.

The commercial sector is the largest user of Pacific salmon and is comprised of the fleet (harvesting sector) and the suppliers, processors, transporters and handlers, (non-harvesting sector). Fishing gear types utilised includes seine, gillnet and troll.⁵ Entry to the commercial fishery is limited in that an individual must buy-out an existing licence holder in order to gain access.

The aboriginal sector represents the interests of the aboriginal community. The aboriginal community regards fishing as an integral part of their culture, and a form of cultural expression, which provides linkages to ancestry and tradition as well as an important aspect of socialisation for young men and women. Fishing serves as an important bond, which ties the community together. Vessels and proceeds from the salmon fishery (*i.e.* cash and food) are spread among the community, which is viewed as an extended family. Within the broader context of the Canadian Constitution, the Federal Government has designated allocation priority to the aboriginal fishery for food, social and ceremonial purposes. This priority exceeds the allocation priority assigned to the commercial and recreational sectors, and is second only to conservation priorities. Commercial fishing is the primary source of employment for some aboriginal communities.

The recreational sector includes recreational anglers and supporting industries including lodges, charters and suppliers. In recent years, the recreational sector has also experienced adverse impacts, primarily related to the 1995/1996 poor salmon harvests, the introduction of strict conservation measures and the modification of regulations specific to the recreational salmon industry. However, given that these impacts are not directly related to the strategy being examined in this case study (the Pacific Salmon Revitalisation Strategy), the recreational sector has been excluded from the scope of this exercise.

III. The Pacific Salmon Revitalisation Strategy (PSRS)

In March 1996, the Federal Department of Fisheries and Oceans Canada (DFO) launched the Pacific Salmon Revitalisation Strategy (PSRS) in the spirit of moving towards a more responsible fishery. The Strategy was precipitated by a number of events. Of primary concern was the fact that the projected commercial salmon catch for 1995 and 1996 was the lowest combined two-year catch since the late 1950s.

^{3.} See Appendix B for cyclical nature of salmon fishery.

^{4.} See Appendix C for fluctuations in salmon prices.

^{5.} See Appendix D for relative volume and value share of salmon for each gear type.

Having averaged 75 600 tonnes during 1991-1994, representing CAD 250 million in landed value, the commercial catch for 1996 was 42 100 tonnes representing CAD 100 million in landed value. In addition, the economic viability of the industry had become an issue of concern. Estimated salmon fleet revenues had significantly declined in 1995 and although there was a projected increase in revenues for 1996, anticipated revenues still represented less than half the average earnings from the early 1990s and approximately one third of average earnings recognised in the 1970s and 1980s. During the 1990s, prices for all species of salmon had fallen by 30% to 50%.

Consequently, in an effort to ensure conservation, resource sustainability and the economic viability of the Pacific salmon industry, the PSRS was launched in response to recommendations submitted to the Minister of Fisheries and Oceans by a salmon industry stakeholder's group. Commonly referred to as the Pacific Policy Roundtable process, its participants included commercial, aboriginal and recreational sectors, representatives from coastal communities and the Province of British Columbia (as observers). The PSRS was primarily designed to address the conservation threat posed by fleet overcapacity in the Pacific commercial salmon fishery, which puts the resource at serious risk, while at the same time, affording licence holders some flexibility in making choices about how they would adapt to the fishery of the future.

3.1 Key Elements of the SRS

Conservation through Risk Averse Management

- DFO's risk averse philosophy, which had been implemented as a result of the poor salmon season in 1995, was reinforced.
- The risk averse philosophy focused on strict conservation measures for target stocks/species, involving a reduction in harvest rates such that spawning escapement targets would be met or exceeded.
- Strict conservation measures included the use of conservative forecasts of major salmon populations, the practice of reducing or foregoing fishing opportunities in cases of uncertainty with respect to stock size or escapement estimates and the practice of providing additional escapement beyond targeted levels.

Voluntary Licence Retirement Programme

- This programme consisted of a federally funded initiative, which afforded fishers the opportunity to relinquish their salmon licenses in return for compensation at market value.

New Licensing Measures

Single Gear Licensing

- Restricts a single licence holder to fish with one gear type as opposed to a combination of gear types.
- Contributes to long-term economic viability by preventing potential further investment in a second gear.

Area Licensing

- Designates specific fishing areas for each gear type, *i.e.*, two areas for seine fishing, three for gillnet, and three for troll.
- Each licence holder initially chooses one fishing area.
- Area choice is for a minimum of four years with long-term area selections to be made after four years.
- Reduces risk of overexploitation by reducing the number of vessels in any given fishery.

Licence “Stacking”

- Allows a licence holder to acquire additional licences from current licence holders.
- Affords the stacked licence holder the ability to access additional fishing areas and fish with additional gear types.
- Stacking provisions: stacking of a second salmon seine licence on a salmon seine-licensed vessel is permitted; stacking of a second non-seine licence (gillnet, troll) on a salmon non-seine licensed vessel is permitted; stacking of gillnet or troll privileges on a salmon-seine licensed vessel is not permitted.

Allows 30% length flexibility in stacking salmon licences: the second licence may be placed on a salmon licensed vessel up to 30% larger (or any amount smaller) than the originating vessel.

New Institutional Arrangements

- To encourage DFO-Industry partnering and increased industry involvement in fisheries management.

Review of Intersectoral Allocations

- A review of intersectoral allocations was undertaken for the purpose of investigating the complex salmon sharing arrangements among the three sectors, *i.e.*, commercial, recreational, and aboriginal, with a view to establishing an intersectoral allocation framework.

*Transition Measures**Abstinence from Fishing and Delayed Selection of Fishing Area*

- Licence holder could choose to refrain from fishing in 1996, thereby avoiding payment of the associated licence fees and delaying selection of a fishing area until 1997.

While the Roundtable recommended a fleet reduction target of 25-50% over 4 years, the PSRS set the target at 50%. The target consisted of a 20% reduction to be achieved through licence retirement and the remaining 30% to be achieved through licence stacking and other measures. The measures implemented to date will be evaluated at the end of the 1997 salmon season, to determine their effectiveness in moving towards the established fleet reduction target. If necessary, additional measures may be established in consultation with industry stakeholders.⁶

3.2 PSRS - Progress to Date

To date, the PSRS has achieved 32% of the targeted 50% reduction to the fleet. The licence retirement programme has resulted in an approximate 18% reduction to the fleet, while the licence stacking programme has resulted in an approximate 14% reduction.

Conservation through Risk Averse Management

DFO's risk averse fisheries management philosophy is being applied as appropriate and has resulted in the meeting or exceeding of all escapement targets for the 1996 season.⁷

Licence Retirement Programme

The voluntary licence retirement programme was completed in July 1996 and resulted in 797 licences being retired at a cost to the Federal Government of CAD 78.5 million. It was observed that

^{6.} An appropriate addendum to this case study will be prepared if warranted by the results of the evaluation.

^{7.} Information on the status of escapement targets for 1997 is not yet available.

fishers took advantage of the licence retirement and licence stacking programmes for various reasons. Many of those taking advantage of these programmes were nearing retirement age and hence, used the programmes as a form of early retirement. Other reasons included heavy debt loads, a belief that earnings would decline due to new licensing measures, a desire to pursue other employment interests and a desire to sell one licence in the case of multiple-licensed vessel owners.

The average price paid for a gillnet/troll licence was approximately CAD 79 000 while seine licenses resulted in average compensation of approximately CAD 414 000 per licence.

Table 1. Breakdown of Licences Retired by Gear Type ¹

Gear Type	Total Licences Pre-PSRS⁸	Retired Licences (Number)	Retired Licences (%)
Seine	539	48	9%
Gillnet	2396	406	17%
Troll	1437	343	24%
Gillnet/Troll ²	17	0	0
Total	4389	797	18%

1. *Source:* DFO Pacific Region Stacking Report, September 1997.

2. Insufficient information to determine if these were gillnet or troll prior to gear selection by the licence holder.

The reduction in the number of licences did not meet the original expectations for seines and gillnets, if there was to be a proportionate reduction. Fewer seine licences were retired than anticipated while more trollers than expected accepted the buy-back. The explanation lies in the market for the various gear types.

New Licensing Measures

Single Gear Licensing

Single gear licensing required gillnet/troll fishers to select either gillnet or troll gear. The fact that a greater number of fishers chose gillnet, further contributed to the noticeable decrease in the size of the troll fleet. In addition, as a result of single gear licensing (and to a lesser extent, area licensing), many fishers found themselves in possession of gear which had been rendered redundant. An appropriate adjustment measure was introduced and is explained in further detail in section 6 of this study.

Area Licensing

There have been requests from some industry representatives for additional flexibility with respect to area licensing restrictions. The Federal Government has denied these requests due to the

^{8.} This includes only those licences eligible for the licence retirement programme and does not include communal licences. Communal licences are not held by individuals. These licences are owned by the community and leased to fishers *e.g.* Northern Native Fishing licences. Consequently, this class of licence was not eligible for the stacking of licence retirement programmes.

implications whereby fisheries managers would face constant pressure from all 3 fleets (*i.e.* seine, troll and gillnet), to allow movement across licence areas.

Licence Stacking

Stacking was permitted over two periods. The first period began 29 March 1996 and ended 30 June 1996, marking the opening of the 1996 fishery. The second stacking period began 15 January 1997, and ended 30 June 1997, marking the opening of the 1997 fishery. Stacking was not permitted in season. Given the controversy of stacking throughout the Review Panel's examination of the PSRS's impact, the Government accepted the recommendation of the Panel chair that a vote be held among all licence holders in each gear sector, at the end of the 1997 fishing season. The vote took place in January 1998. The results of the votes will be used to determine the continuation of stacking in the future.⁹

Table 2. Breakdown of Stacked Licences by Gear Type as of September 1997¹

Gear Type	Total Licences Pre-PSRS²	Stacked Licences (Number)	Stacked Licences (%)
Seine	539	122	23%
Non-Seine	3828	490	13%
Total	4389	612	14%

1. *Source:* DFO Pacific Region Final Report on the 1996 Voluntary Fleet Reduction Licence Retirement Programme.
2. This includes only those licences eligible for the licence stacking programme and does not include communal licences. Communal licences are not held by individuals. These licences are owned by the community and leased to fishers *e.g.* Northern Native Fishing licences. Consequently, this class of licence was not eligible for the stacking or licence retirement programmes.

New Institutional Arrangements

In April 1997, a federal-provincial agreement was signed, establishing a framework for co-operation between the governments of Canada and British Columbia in conserving and managing the Pacific salmon resource. The agreement has led to the establishment of a Pacific Fisheries Resource Conservation Council. To be in place by April 1998, the six members and a chair appointed by both governments will provide long-term strategic advice on matters related to the conservation of salmon and their habitat. It will also make recommendations on research, and focus on stock and habitat assessment initiatives to ensure salmon conservation.

Review of Intersectoral Allocations

In 1996, the Minister of Fisheries and Oceans appointed an independent expert¹⁰ to examine the complex issue of salmon sharing arrangements between the commercial aboriginal and recreational fisheries. A report, including appropriate recommendations for an intersectoral allocation policy

^{9.} The stacking vote held January 1998, 73% voted to continue stacking in all gear sectors; the freeze on stacking activity is now lifted

^{10.} The appointed expert was Dr. Art May of Memorial University in Canada.

framework, was submitted to the Minister of DFO in December 1996. In addition, a separate process is underway to examine the intrasectoral allocation among gear types within the commercial fleet.¹¹

Transition Measures

Abstinence from Fishing and Delayed Selection of Fishing Area

There were 238 licensed salmon vessel owners who elected not to fish in 1996. The breakdown across gear types was 133 from the troll fleet, 78 from the gillnet fleet and 27 from the seine fleet.

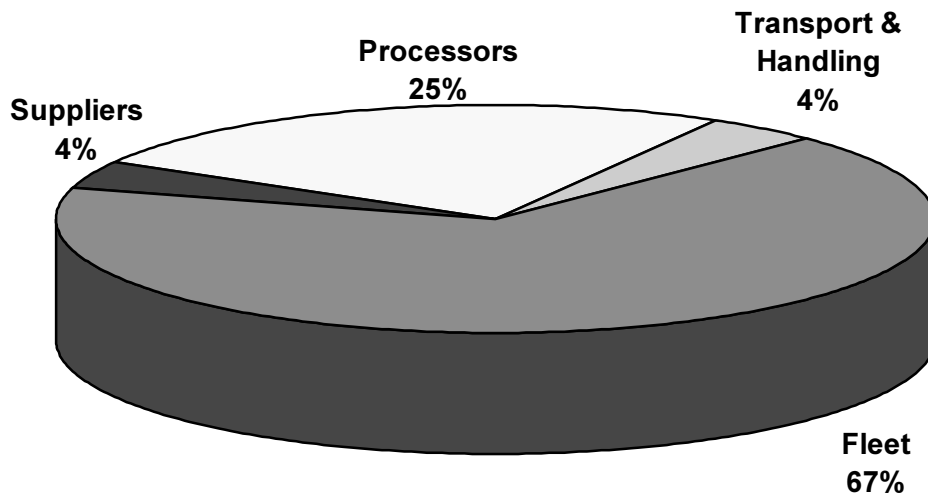
VI. Socio-Economic Characteristics of the Pacific Salmon Commercial Fisheries Sector¹²

4.1 Community Dependence on Fishing Employment and Income

Dependence on Fishing Employment

The Pacific commercial salmon industry generates over 10 000 seasonal jobs distributed across 50 communities. This represents approximately one half of the total number of jobs in the Pacific commercial fishing industry as a whole. Prior to the implementation of the PSRS, the total number of seasonal jobs in the Pacific commercial salmon industry was almost 16 000. This consisted of 10 585 fleet jobs, 3 950 processing jobs, 615 supply jobs, and 640 transport and handling jobs. The following chart demonstrates the proportional breakdowns of these jobs.

Figure 1. Breakdown of Commercial Pacific Salmon Industry Employment



^{11.} The appointed expert was Stephen Kelleher, an independent professional mediator from British Columbia.

^{12.} Data for all charts in this section has been derived from Statistics Canada's 1991 census data. Exceptions have been footnoted appropriately.

The fishing industry as a whole is an important source of employment for some Pacific coastal community economies. Generally, urban centres have greater access to alternate industries and are therefore better able to cope with major upheavals in the fisheries sector. Some coastal communities, on the other hand, had become increasingly dependent upon employment generated by the fishing industry due to a loss of jobs in other traditional sectors of employment such as forestry and government.¹³ In 1991 the unemployment rate in some of these communities exceeded 30%, and was even as high as 62% in one community. This figure can be compared with the 1991 unemployment rate of 10% for the Province of British Columbia as a whole.¹⁴ For these reasons, these coastal communities had become increasingly reliant on employment generated by both the harvesting and non-harvesting sectors of the salmon fishery.

Prior to the implementation of the PSRS, the fleet alone generated over 10 000 seasonal jobs in the Pacific salmon industry. Pacific coastal communities also rely on non-harvesting sub-sectors as sources of employment. The supply sector provides a wide variety of goods and services such as gear, fuel, repairs, insurance, and moorage to the fleet. Vessels acquire many of these supplies, particularly fuel and food, in coastal communities close to the targeted fishing grounds. Some processing sector activity exists in coastal communities where localised plants process salmon into a variety of canned, fresh, frozen and smoked products. Likewise, the fish transport and handling sector employs packers/collectors who deliver fish from the local fleet to the various processing plants. These businesses provide an important source of employment, particularly for rural coastal communities, which in many cases offer little in terms of alternative employment prospects.

Fishing related employment comprises a much greater share of the community economic base in aboriginal communities as compared with non-aboriginal communities.¹⁵ This is due to the existence of fewer job opportunities in aboriginal communities. The average British Columbia provincial unemployment rate for the aboriginal population was approximately 28% in 1991.¹⁶ Again, this can be compared to the average unemployment rate for the province of British Columbia, which was 10% in 1991. Also contributing to the limited alternative economic development prospects for aboriginal people is the fact that aboriginal communities are often remote with no road access to urban areas. Unique cultural issues also compound the effects of job loss on aboriginal communities. For example, aboriginal people are less likely to accept employment outside their local area, due to the strong cultural and historical identification with their community.

Dependence on Fishing Income

Due to the seasonality of the industry, the fishery workforce relies on income from a number of sources. In 1993 the average income for a self-employed fisher working in the Pacific fishing industry was CAD 26 150 and fishing revenues accounted for 36% of this income.¹⁷ The chart below demonstrates the

^{13.} Source: "Fishing for Answers".

^{14.} Source: Statistics Canada 1991 Census Data.

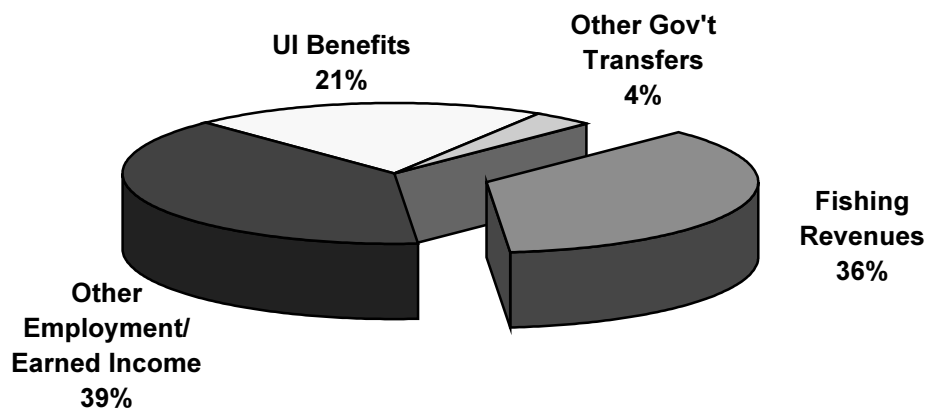
^{15.} See Appendix E for Communities Hardest Hit... and % of Community Represented by Aboriginal Population.

^{16.} Source: Statistics Canada Aboriginal People's Survey.

^{17.} This is not restricted to the salmon fishery and reflects the average income for individuals employed in all fisheries in British Columbia. Income data in this section has been derived from the Department of Human Resources and Development Canada.

breakdown of income sources for an average pacific fisher, including fishing revenues¹⁸, other income¹⁹, UI benefits²⁰ and other government earnings.²¹

Figure 2. Breakdown of Income Sources for Average Pacific Fisher



The average self-employed fisher has access to employment income from other sources with fishing revenue comprising 36% of all income.

4.2 Age Data

Unfortunately, age data is not available for the salmon-fishing sector. Consequently, the harvesting and non-harvesting sectors examined in this section represent all fishery workers in BC based on Statistics Canada 1991 census. The following chart depicts the age distribution for owner-operators and

^{18.} This includes net self-employed fishing revenues.

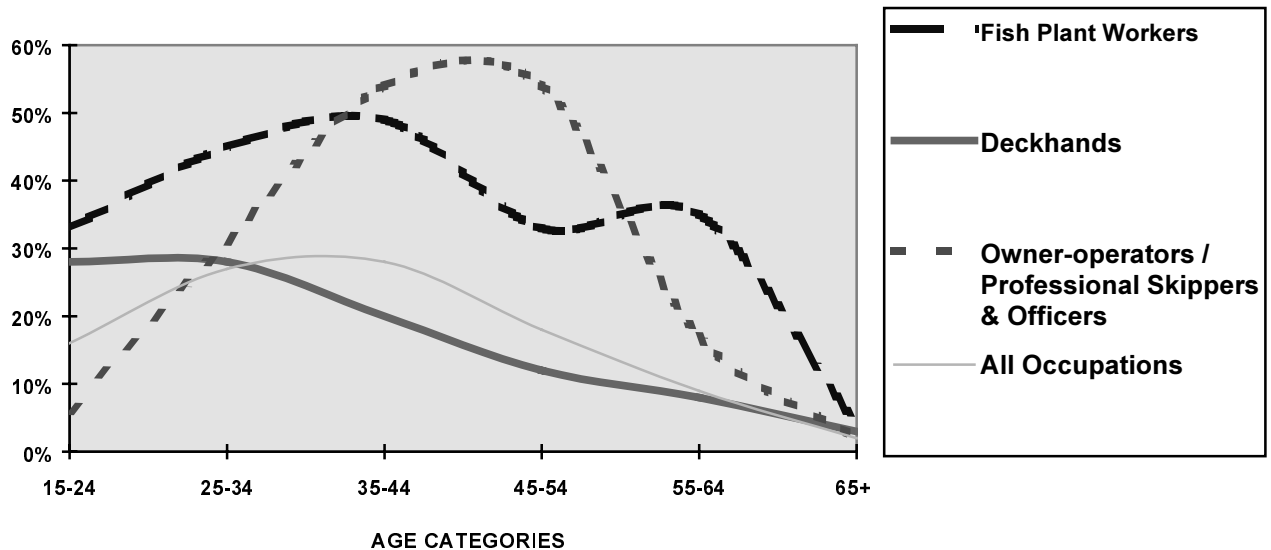
^{19.} This includes other employment income, as well as income from sources such as investment, commissions, alimony and worker's compensation.

^{20.} This includes government compensation through unemployment benefits.

^{21.} This includes government income such as pension income or social assistance.

professional skippers/officers²², and deckhands²³ as compared to fish plant workers/processing labourers²⁴, and all occupations²⁵ in the province.

Figure 3. Age Distribution



The age distribution curve for owner-operators and professional skippers/officers peaks in higher age categories than for deckhands. In the case of owner-operators, this can be attributed to the higher age groups having greater access to the capital and/or credit required to purchase a vessel and one or more fishing licenses. Although professional skippers do not have the same challenge of raising capital or accessing credit as owner-operators, they are required to possess a fishing master's certificate, which requires accumulation of service time and experience. Given the implications of these unique requirements, it is logical that both the owner-operator and professional skippers/officers categories would exhibit a higher age curve than that of deckhands.

On the other hand, the deckhand age distribution curve reflects the regular career progression cycle where young individuals enter the fishing workforce as deckhands in order to gain the necessary experience and training to become owner-operators in later adulthood. For this reason, the deckhand age curve peaks in the younger age categories and subsequently tapers off.

22. For the purposes of this comparison, owner-operators are defined as those individuals holding a valid species licence. Professional skippers/officers include those employed by establishments engaged in operating commercial fishing vessels greater than 100 gross tonnes. The PSRS resulted in a trend towards retirement age individuals taking advantage of the license retirement and stacking programmes. The resulting degree to which the age distribution would have shifted towards greater representation in the younger age groupings is as yet unknown.

23. Deckhands include crewmembers working onboard Pacific fishing vessels, but who do not currently hold a species license.

24. Fish plant workers/processing labourers include machinery operators, fish plant cutters and cleaners employed in fish processing plants.

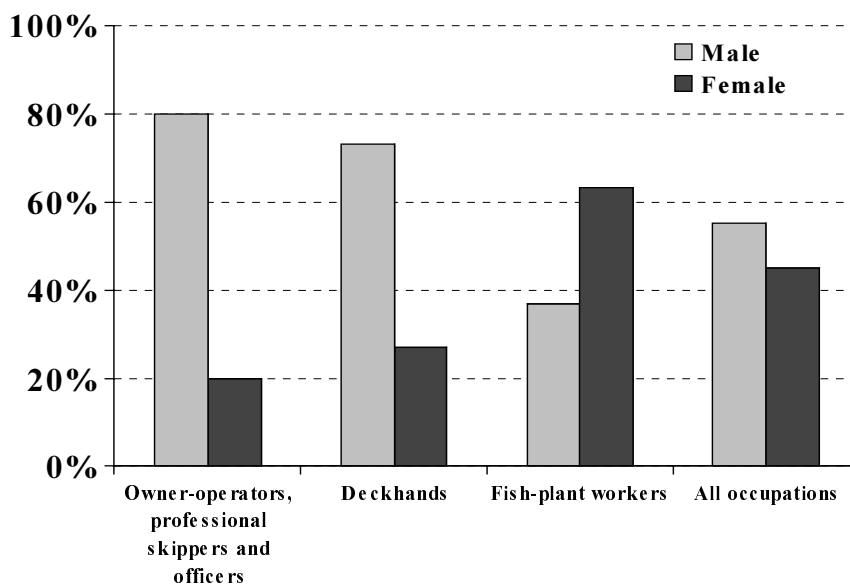
25. All occupations includes age distribution for all occupations within the Pacific Region (*i.e.* the province of British Columbia).

With the exception of deckhands, workers in the harvesting sector tend to be older than the average worker in the province. This is typified by the owner-operator and professional skipper/officer curve which peaks between the age ranges of 35 - 54 in comparison to the curves for processing workers as well as all other occupations in British Columbia which peak between 25-44. Again, this may be attributable to the unique requirements for becoming a vessel owner-operator or professional skipper/officer and the resulting trend towards entry into this occupation in later adulthood.

4.3 Gender Data

Fleet occupations in the fishing industry continue to be male-dominated although this trend is not characteristic in all segments of the industry (see chart below). Although the chart reflects data for the Pacific fishing industry as a whole, it is safe to assume that the same trend of female under-representation would exist in the pacific salmon industry given the similarity of work environments.

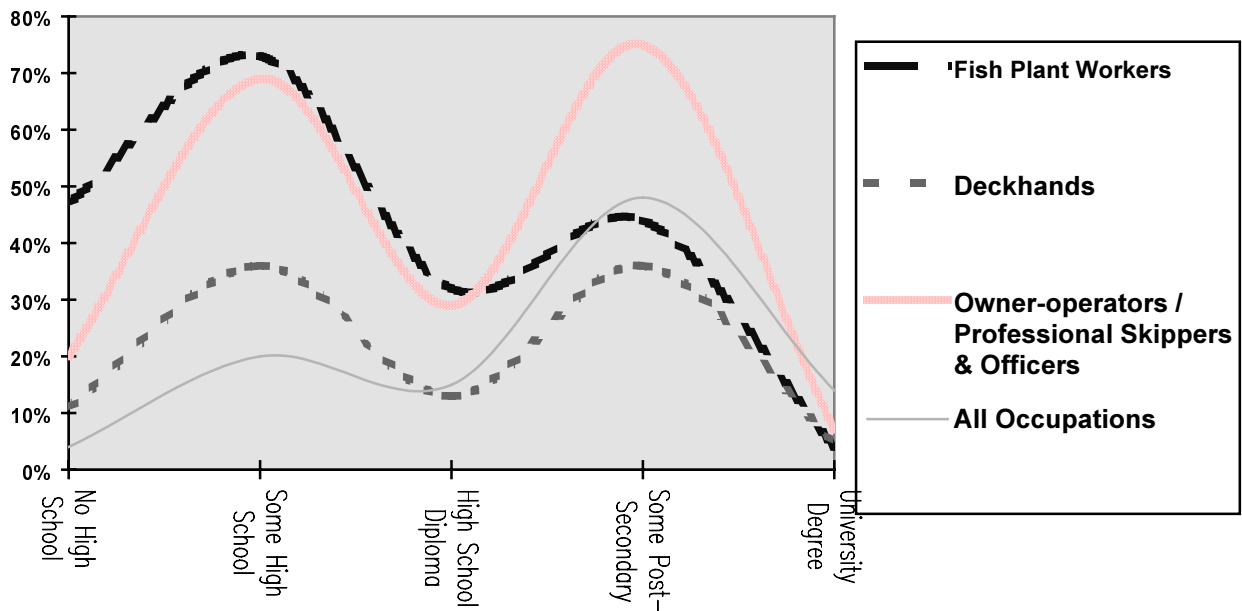
Figure 4. Gender Distribution



4.4 Educational Attainment Data

The chart below demonstrates the striking similarity between levels of educational attainment for fleet occupations. The curves for the fleet occupations are generally identical with the exception of some minor deviations. The most common levels of educational attainment for fleet occupations are “some high school” or “some post-secondary”. It is also interesting to note the distribution of educational attainment across the fleet occupations. The most educated workers are in the higher paying occupations (e.g., owner/professional skippers), with the least educated working in the lower paying occupations (e.g., deckhands). The distribution of varied education levels is evenly dispersed across the two occupational groupings. However, it is significant that the lowest attainment levels are found in the processing sectors.

Figure 5. Educational Attainment



Compared with the trend for all occupations in the province, the fishery workforce demonstrates a varied range of schooling, yet lower levels of formal education than the average worker in the province. The chart demonstrates an approximate 20% gap between the number of fishery workers having attained some post-secondary education or a university degree, as compared to all occupations.

4.5 Transferability of Skills Data

The following information is derived from a training needs assessment carried out in March 1997²⁶, to assist in the planning and delivery of services and programmes aimed at those fishery workers

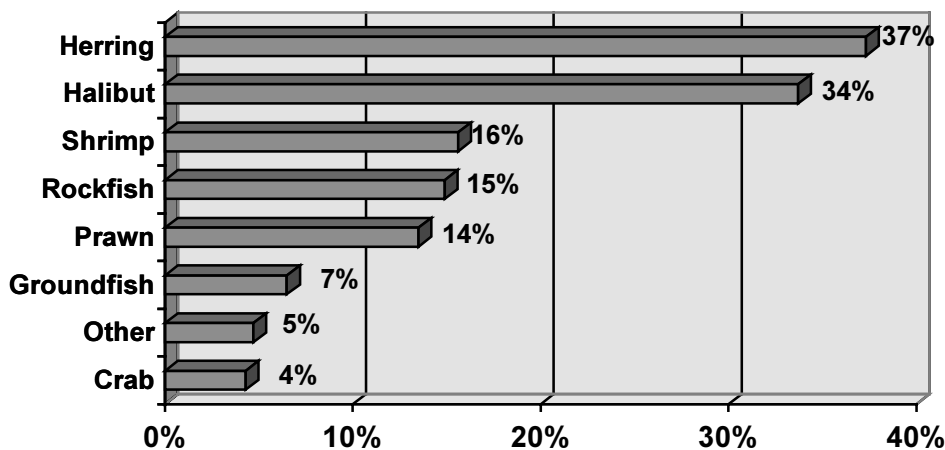
²⁶. Title of the report was the “West Coast Commercial Salmon Fishery - Training Needs Assessment” March 1997, prepared by Kwantlen University College.

requiring transitional assistance. The report is based on the results of 1 143 interviews with members of the Pacific salmon fishery workforce. Data were unavailable regarding the transferability of skills within the non-harvesting sectors.

The report found that the majority of respondents overwhelmingly wished to continue working in the salmon fishing industry. However, at the same time, much expressed interest in diversifying into other fisheries, with halibut being the most popular. Over one-half of respondents indicated an interest in working outside the fishing industry in areas such as trades, business, labouring, environmental, marine, tourism and hi-tech.

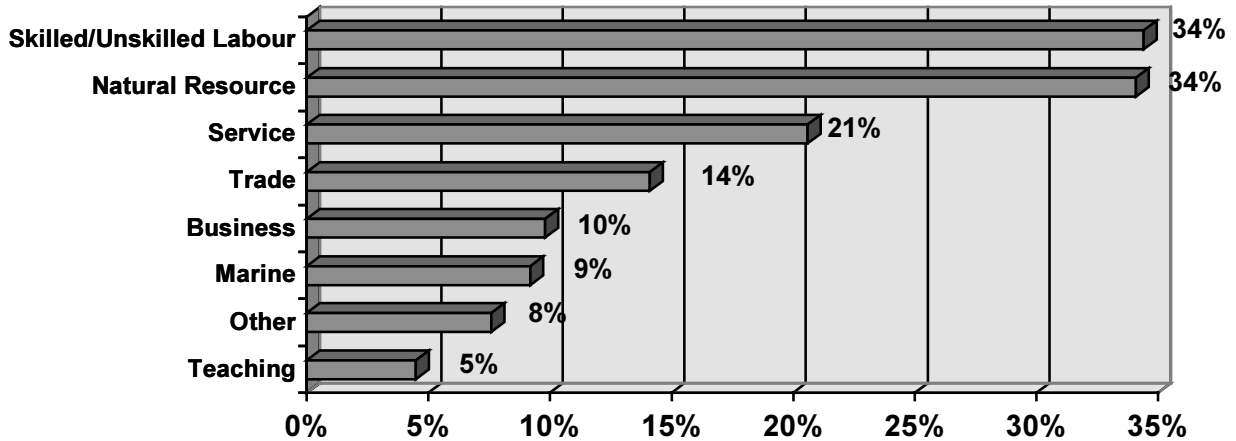
The interviews revealed a high potential for transfer of skills to alternate fisheries within the industry. A number of respondents were already involved in other fishing industries. Over 70% of those interviewed, owned their own vessel and 29% already held licenses for other species. In addition, a number of respondents currently held a job in other fisheries. The chart below demonstrates the additional licenses held by the respondents and the percentage of individuals holding each type of licence.

Figure 6. Additional Licenses Held



The findings of the training needs assessment report also suggest the potential for transferability of skills outside the fishing industry. The report found that 63% of respondents had occupied some other type of employment prior to entering the fishing industry, with 83% having received training in a trade and 54% qualifying for trade certification. The majority of respondents had received training in mechanical, electrical, woodworking and metalwork trades. Furthermore, respondents had acquired training in other areas such as medical/rescue procedures, boat/gear maintenance, scuba diving and tugboat operation. A breakdown of previous employment outside the fishing industry is demonstrated in the chart below.

Figure 7. Previous Employment outside the Fishing Industry



It is important to note that the vast majority of jobs held outside the industry were not career track positions. Rather, the positions were primarily part-time seasonal jobs that provided employment while one awaited an opportunity within the fishing industry. It should also be noted that the training needs assessment report represents only a small sample of the fleet workforce. Nevertheless, the observed trends are promising in terms of providing a preliminary indicator of transferability of skills and experience to new industries and areas of opportunity.

V. Employment Consequences of Implementing the PSRS

As of September 1996, upperbound estimates indicated that the PSRS had led to 2 895 seasonal jobs lost as a result of the PSRS. Of these 2 895 jobs lost, 2 750 consisted of fleet jobs and the remaining 145 jobs were in the supply sector. There are no job losses attributed to the processing and transport and handling sectors as a result of the PSRS.

Many of these individuals affected by the PSRS had either found alternate employment, returned to school or retired from the labour force. It was anticipated that the remaining individuals were in need of various forms of assistance.

5.1 Harvesting Sector Impacts

The licence retirement programme resulted in the removal of 797 licences and vessels from the Pacific salmon fleet while licence stacking resulted in the removal of a further 375 vessels.²⁷ Prior to the implementation of the PSRS, there were over 4 100 vessels and licenses in the Pacific salmon fleet, excluding communal licences.²⁸ As a result of the licence retirement and stacking programmes, the Pacific

^{27.} Licence retirement entails permanent removal of the license, and potential retirement of the vessel with associated loss of crew jobs. Licence stacking on the other hand, results in removal of the vessel with associated loss of crew jobs, but not removal of the licence.

^{28.} See footnote 8. For explanation of communal licences.

salmon fishing fleet has now been reduced to just over 3 000 vessels, holding approximately 3 600 licences. The resulting 2 750 seasonal fleet job losses include 1 173 skipper positions and 1 577 deckhand positions. This represents a 26% decrease in the number of seasonal fleet salmon jobs overall.

In addition to the employment consequences, the PSRS resulted in adjustments to fleet income. These adjustments resulted in both positive and negative impacts. Specifically, area licensing means that, on average, single licence holders will experience higher net incomes. However, licence holders will face greater year-to-year risk and variability in earnings²⁹, particularly for those not participating in fisheries other than salmon.

In addition to the direct impacts of the PSRS, there were also indirect impacts on income levels as a result of the single gear licensing provisions of the PSRS. Many fishers had to strip gear from their vessels as a direct result of single gear licensing. This gear represented a significant investment for these fishers.

Stacking measures have been contentious. The nature of a licence is such that it is considered a privilege and is not recognised as property. Hence, traditional lending institutions do not accept fishing licences as collateral. Appropriate adjustment measures were introduced and are discussed in section 6 of this report.

In a general sense however, the impact on earnings for those continuing to be employed onboard vessels was positive in 1996. On an individual basis, crewmembers have experienced an increase in income, as total crew earnings are now distributed among a decreased number of crewmembers. The same amount of fish is now being harvested by a reduced number of vessels, thereby increasing the economic viability of the pacific salmon fishing industry. Remaining vessels are able to harvest more fish at roughly the same operating cost, resulting in an estimated increase of CAD 21 million in net income³⁰ in 1996. This trend is promising in terms of offsetting lower income levels realised during the poor years of the cycle, and of course, providing more lucrative incomes during the favourable years of the cycle. Overall, the market value of fishing enterprises has increased due to the higher income potential and the expanded market for licences.

The PSRS also had favourable impacts for many of the fishers who left the industry. The licence retirement and licence stacking measures provided relief to those experiencing financial difficulty. Due to the poor 95/96 seasons, many fishers were in a precarious financial position, particularly recent industry entrants who had a sizeable debt to service. The PSRS created a new market for licences and afforded those with heavy debt loads, an opportunity to pay down their debt by taking advantage of the licence retirement and licence stacking programmes. The alternative for many was to go bankrupt. Furthermore, some of these fishers were nearing retirement age, and the licence retirement programme allowed them to sell their licence and retire with dignity. For those interested in pursuing retraining and/or employment opportunities in other industries, the licensing programmes provided the financial resources required following this path.

5.2 *Non-Harvesting Sector Impacts*

The PSRS did not affect the overall productivity of the fishery, but rather, reduced the size of the fleet such that the same amount of the resource was shared among fewer vessels.

²⁹. See Appendix F for variability in landed value according to area/gear type selected.

³⁰. CAD 21 million includes an allowance for the financing cost of a second licence

Given the minimal effects on total fish harvested,³⁰ fleet reductions resulting from the PSRS have had no impact on either the processing or transport and handling sectors, other than increased competition for existing jobs from displaced salmon vessels. There is evidence that former salmon fishing vessels are now competing for salmon packing jobs.³¹

In the case of the processing sector, many processing companies owned salmon seine licenses as a method of ensuring supply for their plants. The impacts of the PSRS have been minimal, as there has been no significant change in the percentage ownership of seine licenses and vessels by processing companies. Furthermore, industry concerns regarding the potential for licence stacking to result in the concentration of the seine fleet in the hands of a small set of processing companies, have not been observed to date. Processing companies held approximately one-third of all seine licences prior to the PSRS and that figure has remained constant to the present time.

On the other hand, the supply sector has been affected in the order of 145 jobs lost from a total employment base of 615 salmon industry supply jobs. These job losses are attributable to the fleet reductions and the resulting decrease in the number of vessels requiring outfitting. The smaller fleet spent less money on fuel, food, gear, repairs and so forth, which resulted in reduced revenues to suppliers. The consequence was layoffs and/or reduced hiring for the peak season.

5.3 *Community Impacts*

Several communities were severely affected by job losses in the salmon fishery due to their heavy dependence on commercial fishing. Fleet reductions resulted in a 26% decrease in the number of fleet salmon jobs overall. However, put in a broader perspective, fleet job losses represented less than 1% of total employment in the province.³²

Notwithstanding the minimal provincial implications, the community impacts of fleet reductions were considerable. Fifteen communities were most affected by job losses associated with the PSRS. When expressed as a percentage of community employment, seasonal fleet job loss in these communities ranged from 3% to as high as 46%. Two severely affected communities exhibited job loss rates of 46% and 35% while 4 communities struggled with job loss rates of between 11% and 14%. The remaining communities had job loss rates ranging between 3% and 9%. Communities heavily relying on the salmon fishing industry have had to readjust and there is a requirement for significant retraining initiatives in these areas.

One of the community impacts of the PSRS consists of a slight shift in the distribution of salmon licences between rural and urban communities. As licences were retired or stacked, the distribution of the remaining licences among the various communities was altered. In particular, the urban lower mainland area experienced a net increase in its share of licences while rural communities experienced an overall decrease in their share of licences. Prior to the implementation of the PSRS, salmon jobs outside the urban lower mainland comprised 65% of total salmon jobs. However, these same rural areas accounted for 69% of seasonal jobs lost as a result of the PSRS.

^{31.} It was estimated that the risk averse management approach would reduce the total catch by 10 -15% on average. This was more significant for certain species such as chinook and coho.

^{32.} Source: ARA Consulting Group Inc. - "Fishing For Answers" report. Although the processing and the transport and handling sectors did not experience impacts related to the PSRS, these sub-sectors have experienced severe impacts as a result of the poor salmon seasons.

^{33.} Source: Fishing For Answers Report, Exhibit 16.1

Nevertheless, there are some mitigating factors to consider.³³ The population of the lower mainland is growing faster than in rural areas and advances in technology and transportation have diminished the requirement for fishers to live close to fishing grounds. There is also a trend for individuals residing in rural communities to relocate to urban centres as income increases. For these reasons, the decrease in the rural share of licences may reflect the general demographic trends at play among rural and urban centres.

Finally, a number of the most affected communities included large populations of aboriginal peoples. In aboriginal communities, fishing activity comprises a greater share of the community economic base and there are fewer job opportunities available on the whole. Limited road access and cultural issues such as the decreased likelihood of accepting alternate employment outside the home community and the sharing of earnings among the community, also exacerbate the impacts for aboriginal communities. Furthermore, many aboriginal people do not have the capital or access to credit required purchasing additional salmon licenses through stacking.

5.4 Summary of Impacts

Appendix G provides an overview of the impacts of the PSRS both in terms of financial and job losses.

VI. Social and Labour Policies to Deal with Structural Adjustment

In response to the substantial changes introduced by the PSRS and the rapid implementation of these changes, an independent Federal-Provincial Review Panel was formed in September 1996 to review the impacts of the PSRS on individuals and communities. The Panel consisted of one representative from each of the provincial and federal governments as well as an independent chair. The Panel undertook a series of comprehensive community-based consultations on the pacific coast and subsequently developed a set of recommendations and appropriate adjustment measures. In its response to the recommendations of the Panel, the Federal Government announced that federal funding in the amount of CAD 35.7 million would be provided in support of the following adjustment measures:

- A habitat restoration/enhancement pilot programme (CAD 15 million).
- A facilitated access to credit programme for commercial salmon licence holders wishing to acquire a second licence for the purposes of stacking (CAD 5 million).
- A gear payment programme (CAD 8 million).
- A jointly funded federal-provincial early retirement programme (CAD 7.7 million); conditional on a matched contribution from the provincial government.

More recently, in April 1997, a Federal-Provincial agreement was ratified between Canada and British Columbia for the purpose of conserving the salmon resource, thereby helping a key sector of the British Columbia economy. The agreement allows for involvement of all stakeholders in decisions relating to conservation, management and enhancement and protection of salmon stocks and is based on the

³⁴. Source: Fishing For Answers Report.

premise that effective conservation is essential. In conjunction with this agreement, the provincial government announced CAD 22.5 million for habitat restoration and community development.

6.1 Programmes Affecting Conditions and Income while Employed

Canadian Federal and Provincial Governments have in place general labour laws, minimum-wage policies, employment conditional benefits, and employment or industry tax credits. The implementation of the PSRS has not resulted in any adjustments to these laws and policies. For this reason, they are not addressed in this section. However the following adjustment programmes have been implemented to address income related issues arising from the implementation of the PSRS:

Gear Payment Programme

The Federal Government allocated CAD 8 million dollars to the gear payment programme. The programme was introduced to provide compensation to combination gear licence holders for gear rendered redundant as a result of the introduction of the single gear and area licensing provisions of the PSRS. An independent industry committee was established to provide advice on programme design and implementation, while an independent agent was engaged to facilitate the purchase and/or sale of the redundant gear. The maximum amount payable to any eligible recipient was CAD 10 000 per salmon licence.

The deadline for applications was 18 April 1997, with a total of 822 applications received from vessel owners. The programme was completed in fall 1997, with payments made to some 800-vessel owners, totalling CAD 6.4 million. The average appraisal value was CAD 7 500 per vessel. The remaining balance of CAD 1.6 million was transferred to the habitat component of the PSRS. Federal Government revenues from the scrap and sale of gear approximated CAD 135 000 with the remaining gear donated to China and Cuba for their developing fisheries.

Facilitated Access to Credit Programme

The Programme was established to provide financial assistance to seine, troll and gillnet licence holders wishing to stack a second licence in order to fish another area and/or gear, but who were unable to obtain the necessary credit from traditional financial sources. A total of CAD 5.5 million was made available for the programme, funded primarily through the Federal Government. Eleven coastal Community Futures Development Corporations (CFDCs), not-for-profit corporations affiliated with the federal agency, Western Economic Diversification, aimed at promoting community economic development are responsible for programme delivery and has contributed CAD 500 000 to the total CAD 5.5 million.

All stacking loan repayments as well as any funding remaining after 30 November 1997, will be credited to a Fisheries Legacy Fund established by the CFDCs, to support fisheries-related projects that result in the more efficient exploitation of the Pacific fisheries. This remaining funding will be administered such that first priority will be given to applications for credit under the licence-stacking programme.

Prior to the June 30th stacking moratorium, seventeen licence stacking loans were completed, amounting to almost CAD 1.7 million. Loans have ranged from CAD 100 000 -CAD 120 000 for gillnet licences and CAD 80 000 - CAD 100 000 for troll licences.

Reductions to Planned Licence Fee Increases

The PSRS introduced a phasing-in of planned licence fee increases for commercial salmon over a two year period with 50% of the increase implemented for 1996 and the balance put into effect for the 1997 season.

6.2 Social Security Programmes

In terms of old-age pension plans, the Canada Pension Plan (CPP) provides pension payments to those over the age of 60 or 65 depending upon the eligibility of the individual. The PSRS did not involve any adjustments to the CPP.

Early Retirement Programme

A total of CAD 7.7 million was announced in the response to the Review Panel's recommendations for an early retirement programme, contingent on matched funding from the Province. The programme did not materialise due to lack of funding from the provincial government. It should be noted, however, that study findings indicate that one of the populations taking greatest advantage of the licence retirement initiatives were those at or near retirement age. In this sense, the licence retirement programme served as a form of early retirement for licence holders. However, an early retirement programme was seen as a means to assist non-licence holders displaced through the licensing policy changes.

Unemployment Benefits

The introduction of a new Employment Insurance programme (EI) replacing the previous Unemployment Insurance programme (UI), has exacerbated the impacts of job loss for some seasonal workers. The revised EI scheme, introduced in 1996 provides less compensation to individual users than that which was offered under the previous UI programme. However, because EI is now hours-based (earnings-based for self-employed fishers) rather than insured weeks based, more individuals are able to access benefits, albeit at a lower rate. The EI reforms are summarised as follows:

- Lower Maximum Insurable Earnings of CAD 39 000.
- Lower maximum weekly payment of CAD 413.
- Increased clawback provisions for high-income earners.
- A family supplement for those in low-income families (<CAD 26 000).
- The intensity rule, which sees benefit rates reduced for heavy users of EI.
- Increased new/re-entrance requirement.
- Allowable earnings while collecting benefits.
- Divisor of 14 to 22 weeks for benefit calculations depending on the unemployment rate of the area.

The impact in benefits paid to self-employed fishers (15% reduction) is comparable to workers in other seasonal industries: 16% for forestry and logging, 15% for mining and 14% in construction.

It is hoped that these impacts will be mitigated through the job creation, retraining and community development initiatives being designed and implemented in severely affected communities (See Labour Market Policy section).

6.3 Active Labour Market Programmes

The following programmes and initiatives each comprise a combination of retraining, job creation and rural/regional development interventions. For the most part, these programmes are in the introductory stages, and it is therefore premature to elaborate on specific projects and initiatives implemented under each of the broad initiatives.

Habitat Restoration and Salmon Enhancement Pilot Programme

This three-year pilot programme has been initiated with each of the federal and provincial governments contributing CAD 15 million for a total of CAD 30 million. The programme provides assistance in rebuilding those salmon stocks requiring short-term intervention and priority is being given to projects that increase fish stocks and employ displaced fishers in or near their communities. The federal and provincial initiatives are articulated as follows:

Federal Programme

The federal government has allocated CAD 7.25 million for habitat management activities in each of years 1997/1998 and 1998/1999. An additional CAD 500 000 will be allocated for 1999/2000, the third and final year of the programme. For 1997/1998, CAD 4.85 million has been allocated to specific projects, with the remaining CAD 2.4 million in the final stages of the allocation process. In determining which projects would be funded under this initiative, priority is being given to those projects addressing fish stocks at risk, improving habitat quality or quantity and utilising displaced and/or under-employed fishers.

Provincial Fisheries Renewal Agency

This initiative represents the provincial contribution to the Habitat Restoration and Salmon Enhancement Programme. In 1997, British Columbia announced the creation of a dedicated fisheries renewal agency, known as Fisheries Renewal BC. Initial funding for the agency has been provided in the amount of CAD 22.7 million. This amount includes the provincial contribution of CAD 15 million under the Habitat Restoration and Enhancement Programme detailed above. The agency is a crown corporation aimed at helping coastal communities adapt to changes in the fishing industry through diversification and enhancement into new fisheries related markets. The top priorities of the agency consist of programmes for fisheries restoration and enhancement, fisheries diversification and marketing, skills training and development for fisheries workers, community-based fisheries job creation strategies and development of a long-term provincial fisheries renewal strategy.

Pacific Resource Conservation Council

This Council is being formed to provide advice on conservation of the salmon resource and its habitat. (The Council consisting of six members) and an independent chair appointed by both governments will provide recommendations directly to the Minister of Fisheries and Oceans Canada and the Province of British Columbia.

Federal Human Resources Programme Assistance

Human Resources Development Canada (HRDC) has expended CAD 26 million in the 1995-96 to 1997-98 period to assist displaced fishery workers. Assistance has been provided in a number of areas including job creation partnerships, employment assistance services, subsidies to employers hiring displaced workers and the national Transitional Jobs Fund (TJF) programme. Introduced by HRDC in July 1996, the three-year CAD 300 million TJF was set up to create 15 000 new jobs in high unemployment regions.

Federal-Provincial Industry and Community Development Team

In the context of the April 1997 federal-provincial agreement, a federal-provincial team has been established to address industry and community development issues. The team is mandated to formulate a range of options regarding new ways to promote awareness of existing programmes and opportunities; improve access, delivery and funding of these programmes; work with communities to promote and define plans with respect to effective and sustainable community development including a sustainable fishery; and encourage investment and employment. Given that the focus is on developing options, no funding commitments have been made to date under this initiative.

Provincial Community Fisheries Development Centres (CFDCs)

These are not to be confused with the Community Futures Development Corporations (CFDCs) which are affiliated with Western Economic Diversification and delivering the access to credit programme. The provincial CFDCs³⁴ were established in May 1997, by the Government of British Columbia for the delivery of community-based fisheries initiatives. Funding in the amount of CAD 1.5 million over 3 years has been provided by the province to increasing the capacity of fisheries-based communities to undertake fisheries sector development and transition planning; assist unemployed fisheries workers by providing career counselling, training and job placement assistance; and increase or maintain salmon fisheries through habitat restoration and enhancement.

Management of these centres is carried out by a non-profit society. The CFDCs will assist in securing and channelling federal and provincial funding to those communities affected by the salmon fleet restructuring initiatives. To date, some CAD 11 million from HRDC has been channelled into communities to assist fishery workers.

^{35.} CFDCs are located in Vancouver, Prince Rupert, Nanaimo and Port Hardy.

VII. Conclusion

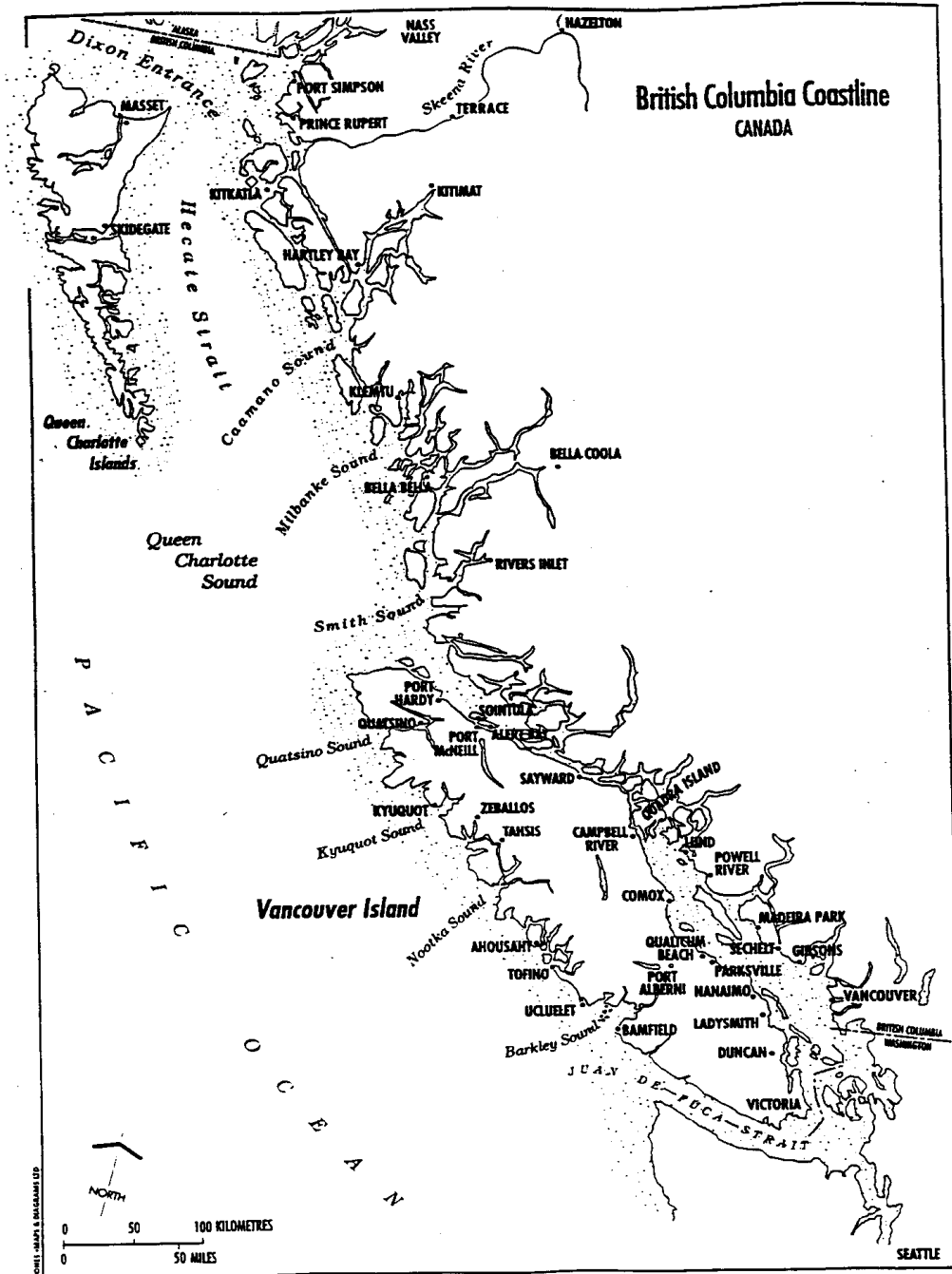
The Pacific salmon fishery provides a variety of consumer products and a valued source of commerce for the province of British Columbia. Consequently, changes to the fishery directly or indirectly affect all British Columbians. In recent years, the BC salmon fishery has undergone sweeping changes, most notably in 1996, where the fishery experienced a particularly poor salmon-harvesting season coupled with the implementation of the PSRS. The PSRS introduced long-term ramifications for the Pacific salmon fishery as a whole, which resulted in a combination of positive and negative consequences for the Pacific salmon fishery workforce. The PSRS impacted primarily on the harvesting sector with lesser impacts on the non-harvesting sector. There were also important impacts for Pacific coastal and aboriginal communities.

Notwithstanding the negative impacts of the PSRS on a number of coastal communities, when put in a broader perspective fleet job loss attributed to the implementation of the strategy, represented less than 1% of total employment in the province. The PSRS has also introduced some promising trends within the industry. Remaining vessels are able to harvest more fish at roughly the same operating cost, resulting in an estimated increase of CAD 21 million in net income in 1996, despite lower salmon prices. Furthermore, crew members have experienced an increase in average income, as total crew earnings are now distributed among a fewer number of crewmembers. Overall, the market value of fishing enterprises has increased due to the higher income potential and the expanded market for licences.

The introduction of a number of structural adjustment programmes is also a positive development in terms of successfully addressing key areas of concern surrounding the implementation of the PSRS. Both the gear payment and access to credit programmes are mitigating the potential loss of investment in terms of gear rendered redundant as a result of the single gear and area licensing policies and the disadvantage to fishers unable to obtain the necessary capital or credit to participate in licence stacking. Furthermore, the voluntary licence retirement programme has served as a form of early retirement for fishers wishing to retire from the fishery.

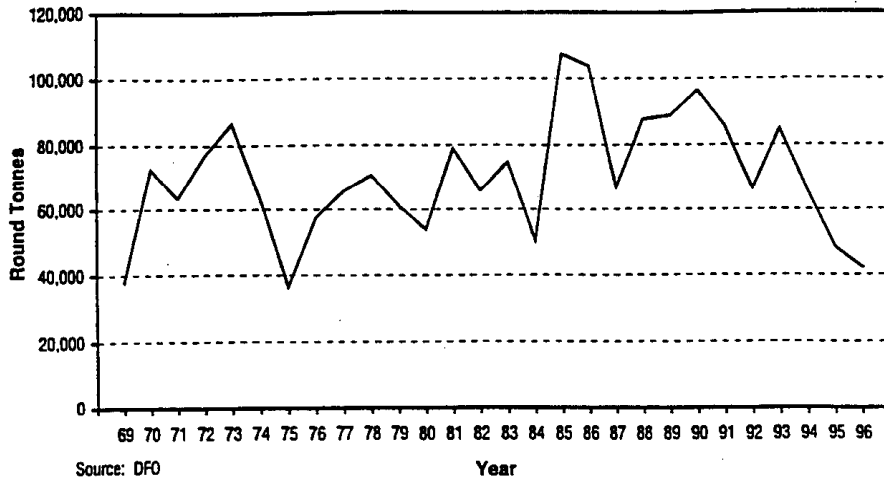
The implementation of both provincial and federal initiatives in the area of habitat restoration and enhancement is promising in terms of providing future community development; job creation and retraining initiatives for displaced fishers. Perhaps most importantly, the strengthening of federal-provincial and DFO-Industry partnerships aimed at moving to a more responsible fishery through improved conservation and management of the resource provides the potential for a robust and economically viable Pacific salmon fishery.

Appendix A



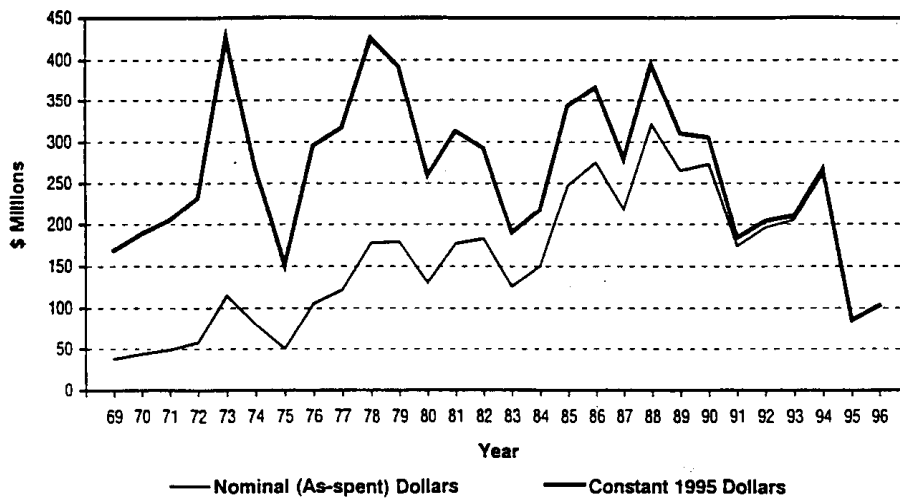
Appendix B

BC Commercial Salmon Harvest: 1969 to 1996



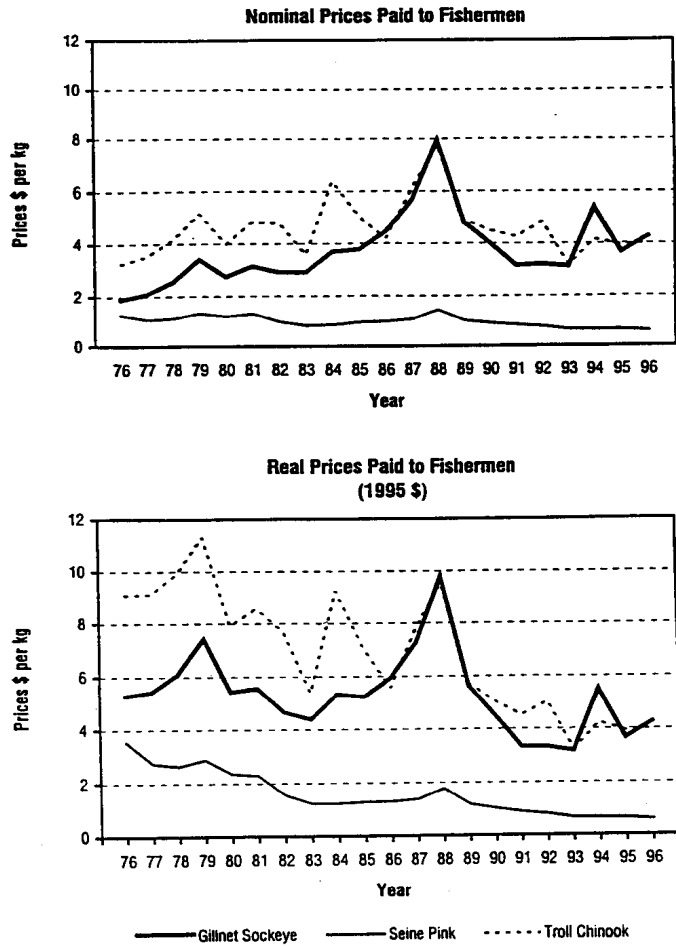
The commercial salmon harvest in BC is cyclical, but the 1995 and 1996 catches are among the lowest in the last 25 years.

Landed Value of the BC Salmon Fleet: 1969 to 1996



In real (inflation adjusted) terms, the landed value of BC salmon has declined since 1988.

Appendix C



Source: ARA estimates

The real (inflation-adjusted) salmon prices paid to BC fishermen has declined significantly over time.

Appendix D

1991 to 1994 Average Annual Commercial Catch of BC Salmon

	1991-1994 Average Commercial Catch			
	Seine	Gillnet	Troll	Total
Harvest (tonnes)				
Chinook	291	579	3 819	4 689
Sockeye	12 526	12 992	4 275	29 793
Coho	592	556	6 192	7 340
Pink	11 855	1 959	3 508	17 323
Chum	9 013	6 837	585	16 435
Total	34 276	22 923	18 379	75 578
Value (USD million)	79.6	67.2	64.6	211.4

Source : DFO Catch Statistics and ARA estimates

Over the 1991 to 1994 period, the salmon fleet caught on average of 75 600 tonnes worth USD 211 million in landed value.

Appendix E

Communities Hardest Hit By Long Term Salmon Fleet Job Losses

	Job Loss as a % of Employment	# of Salmon Jobs Lost	1991 Unemployment Rate (%)	1991 Average Household Income (USD)	Aboriginal Community (% of Population)	Road Access to Urban Area ?
Ahousaht	46	32	33	25 700	97	No
Kyuquot	18	14	33	Na	82	No
Kitkatia	14	5	65	24 000	96	No
Bella Bella	11	38	35	30 000	89	No
Sointula & Area	11	40	26	42 600	1	No
Alert Bay & Area	10	63	21	42 800	51	No
Port Simpson	9	11	62	27 900	95	No
Sayward	7	13	5	49 900	Na	Yes
Hartley Bay	6	2	36	Na	84	No
Masset & Area	4	46	10	44 600	31	No
Klemtu	4	4	32	22 000	93	No
Port Hardy	3	80	13	48 200	13	Yes
Quadra Island & Area	3	40	14	40 100	4	Yes
Tofino	3	20	15	38 600	28	Yes
Ucluelet	3	29	12	48 900	15	Yes
Prince Rupert & Area	2	159	16	53 100	18	Yes
Bella Coola	2	5	18	26 300	96	No
Qualicum Beach	2	37	9	43 200	1	Yes
Parkville	2	53	11	38 000	<1	Yes
Bamfield	2	9	12	39 800	13	Yes
BC	<1	2 750	10	46 900	2	Na

Source : ARA estimates and Statistics Canada data

Appendix F

Landed Value by Area in the 1996 Salmon Fishery

Gear/Area	Licences	1996 Landed Value USD millions	USD per Licence
Seine			
A North	173	25.7	148 600
B South	<u>288</u>	<u>7.4</u>	<u>25 700</u>
	461	33.1	71 800
Gillnet			
C North	1 133	43.5	38 400
D Inside	312	4.2	13 500
E Fraser	<u>541</u>	<u>10.6</u>	<u>19 600</u>
	1 986	58.3	29 400
Troll			
F North	292	5.5	18 800
G Outside	442	5.5	12 400
H Inside	<u>118</u>	<u>0.7</u>	<u>5 900</u>
	852	11.7	13 700
Total *	3 299	103.1	31 300

* Excludes 32 small boat licences of unknown area

Source : ARA estimates

In 1996, the salmon fleet experienced a wide income distribution within each gear type depending on area selection.

Appendix G

Impacts of the Mifflin Plan

	1991-1994 Average	Projection		Impact of Mifflin Plan
		1996 Actual	1996 Without Mifflin	
	(1)	(2)	(3)	(4) = (2) – (3)
Harvest (tonnes)	75 600	42 100	42 100	0
Licences Vessels	4 367	2 956	4 129	(1 173)
Fleet Indicators				
Fleet Revenues USD million	211.4	103.1	103.1	0
Fleet Net Income million USD	11.7	(8.3)	(29.3)	21.0
Crew Shares USD million	88.4	39.7	39.7	0
Crew Jobs USD per crew job	10 585	7 220	9 970	(2 750)
	8 350	5 500	3 980	1 520
Fleet Suppliers Indicators				
Supplier Revenue USD million	82.1	42.2	61.3	(19.1)
Supplier Wages USD million	12.3	6.3	9.2	(2.9)
Supplier Jobs	615	315	460	(145)
Processor Indicators				
Processor Revenues USD million	425.0	210.0	210.0	0
Plant Wages USD million	39.5	22.6	22.6	0
Plant Jobs	3 950	2 260	2 260	0
Fish Transport and Handling				
Revenues USD million	16.0	9.3	9.3	0
Wages USD million	6.4	3.7	3.7	0
Jobs	640	370	370	0

Note : 1. () means negative number.

2. net income is return to licence and vessel owner before tax (but after skipper and crew shares have been subtracted)

3. The 2 956 vessels operating in 1996 are the 4 367 base less 238 not fishing less 798 licences sold to the federal fleet reduction programme (" buyback ") less 375 licences consolidated on existing vessels (" stacking ").

4. Processing jobs refer to hourly production workers only *i.e.* exclude admin and selling job.

Source : ARA estimates

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KOREA

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I. Introduction

Korea's production-oriented fishery development policies, which have aimed at increasing production from its coastal and offshore fisheries, have encouraged the over-exploitation of most of its marine fishery resources. Overfishing is a common phenomenon throughout the country's coastal and offshore waters; only a few coastal areas have managed to escape it. Meanwhile, the environmental degradation of coastal waters caused by water pollution and the reclamation of inter-tidal mudflats is threatening the sustainable development of coastal and off-shore fisheries and even the existence of some traditional fisheries.

Evidence of over-exploitation of coastal and off-shore fisheries is primarily indicated by: (i) a fall in catch per unit effort; (ii) a decline in size of fish caught; (iii) increased uncertainty in locating and catching fishes; and (iv) a rise in the share of trash fish as a percentage of the total catch. Declining resource abundance has, in turn, forced Korean fisheries to restructure. Structural adjustment, combined with an effective system for managing fishery resources, is urgently needed in order to reduce fishing effort, protect the coastal environment, preserve coastal and off-shore fishery resources, and return the industry to profitability.

As fishing capacity increased, the shortage of fishing labour for coastal and offshore fisheries has been one of the critical problems in recent years. And as out-migration of young workers has intensified, fishing operations in coastal communities have been taken over by women and elderly people. This decline in the availability of young, male fishery workers has created further pressure for structural adjustment. Clearly, it is necessary to take into account such changing conditions in the market for fishing labour when formulating structural adjustment policy.

The main objective of this paper is to examine the factors that forced the Korean government to initiate a structural adjustment programme for fisheries and to discuss changes in the fishing labour conditions that have favoured structural adjustment and a more sustainable development of Korea's fishery resources.

II. Fishery Structural Policy and the Fishing Labour Market

2.1 *The General Structure of Korea's Fisheries*

In 1995 Korea produced 3.35 million tonnes of fishery products — over five times what it produced in 1965. Most of this increase can be attributed to production-oriented fishery policies. About

43% of total fishery production came from offshore and coastal waters; another 1% came from inland waters. The main species of fish caught in Korean waters are anchovy, mackerel, hairtail, yellow corvina, squid, and blue crab. The seas around the Korean peninsula also teem with shellfish such as oyster, abalone, and top shell, and seaweeds such as laver, sea mustard, and fusiform. Most fishery products are used for human consumption.

While off-shore and coastal fisheries still account for the bulk of national production, their contribution has fallen, from 52% in 1984 to 43% in 1995. Distant water operations have steadily expanded, and in 1995 accounted for over one-quarter of the total harvest. Production from aquaculture has also been increasing, thanks in large part to new developments in technology. Aquaculture's share of total output increased from 13% in 1970 to 30% in 1995. Some 107 000 hectares were used to produce about 996 000 tonnes. Approximately 50 fish species, 15 shellfish species, 10 seaweed varieties and other aquatic animals and plants are being produced.

2.2 *Fishery Policies Focusing on Structural Adjustment*

The increase in fishery production has been achieved mainly through exploiting existing fishing grounds more intensively, extending fishing operations into new fishing grounds, and promoting the development of aqua-culture. It is now recognised that these production-oriented development policies contributed to the over-exploitation of coastal fishery resources. To prevent further over-exploitation of coastal fisheries resources and international fishery environments, the Korean government is cautiously re-examining its fishery policies along the following lines:

- Coastal fishery resources are to be conserved and cultivated in an effort to enhance fishery stocks and halt the degradation of coastal environments caused by land reclamation, marine pollution, and various other human activities.
- A more-effective fishery resource management system is being developed.
- The capacity of the country's monitoring and control system is being strengthened, in order to prevent illegal fishing.
- The structure of the fishery sector is being adjusted to reduce fishing effort in Korea's adjacent waters, to allow over-exploited fishery resources to recover.
- Foreign workers are being recruited to work on Korean vessels in an effort to alleviate the labour shortage in the offshore and distant-water fisheries.
- Fishing communities are being developed with the aim of improving fishermen's welfare, living standards and part-time employment opportunities.
- Fishing technology, marketing and processing are being improved and strengthened to increase the value of fish and fish products and the income of fishermen, especially in small-scale fisheries.

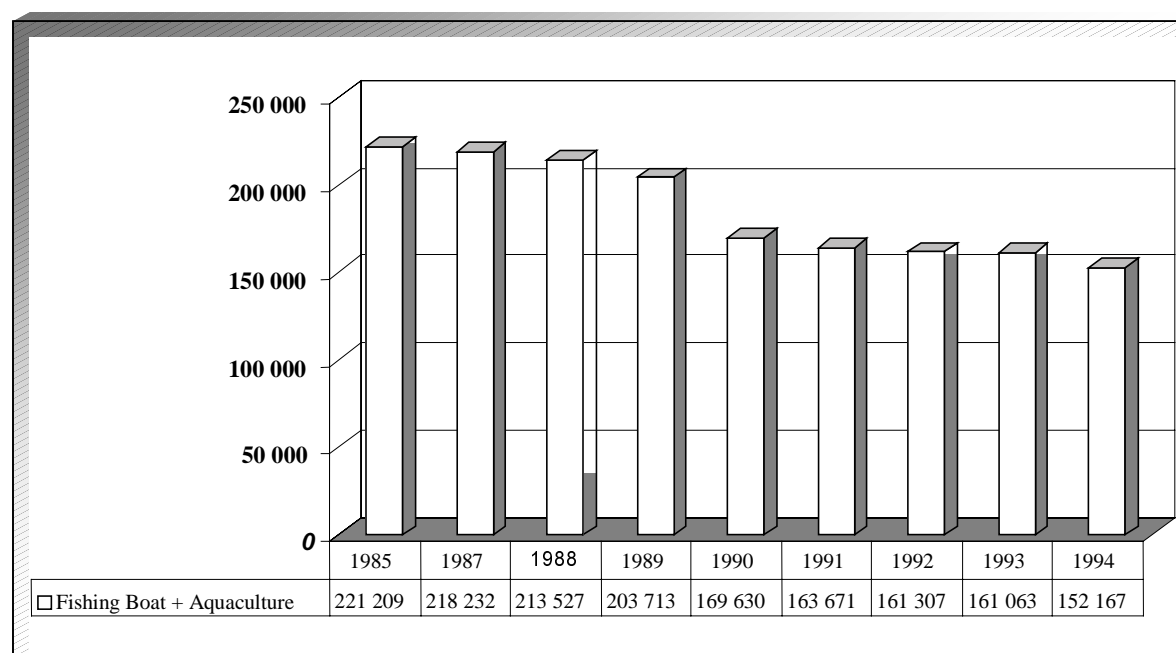
III. Fisheries Structural Adjustment

3.1 The Status of Labour in Fishing Communities

The development of the Korean economy in the past two decades had been led largely by a strategy of industrialisation. Economic growth has been attended by the usual demographic forces, which have affected the fishery sector in various ways. Among others changes, the population in the coastal fishing and fish farming communities declined, and income gaps between fishery and non-fishery sectors widened. From 1970 to 1993 the number of fishery households (defined as households in which at least one person was engaged in fishing or aquaculture) declined by an average of 3 600 a year, and the number of people living in such households (the “fishery population”) declined by 33 000 a year.

The dramatic decline in the fishery population over such a short period left the fishery sector with a labour shortage, particularly during the peak demand season for commercial fisheries. As shown in Figure 1, the number of full-time fishery workers engaged in fishing and aquaculture decreased dramatically: in 1985, 221 209 fishery workers were employed in capture fisheries or aquaculture; by 1990 their numbers had dropped to 169 630, and by 1995 they stood at 152 167. Thus, from 1985 to 1994, there was a reduction of almost one-third in the number of fishers engaged primarily in fishing.

Figure 2. Trends in full-time Fishery Workers in Harvest Fishing and Aquaculture



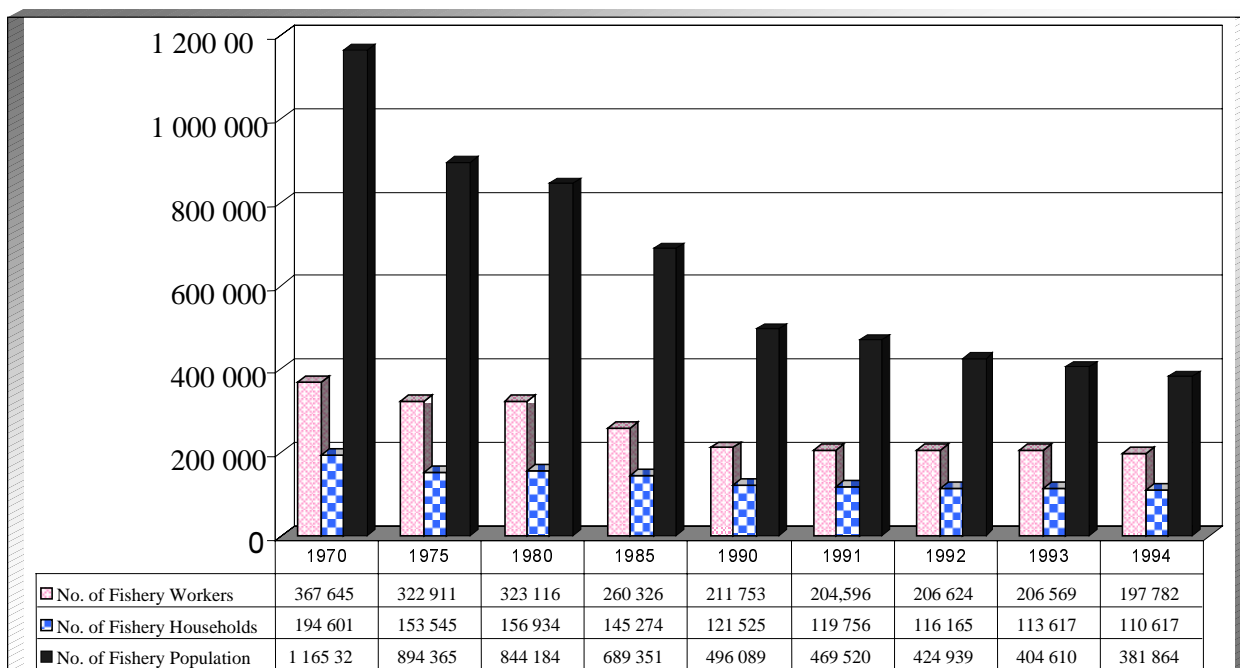
Note: The data exclude fishers engaged in the collection of wild shellfish and seaweed.

Source: The Fisheries Association of Korea, *Korean Fisheries Yearbook 1986-1995*, Seoul, 1996.

The number of fishery households and population has also declined over time — by 43% since 1970 in the case of fishery households (Figure 2). As of end-1994 there were just under 382 000 people living in fishery households, or 2.5% of the total population of Korea, compared with 5.7% in 1993. Fishery households engaged only in fishing declined by 4.4% (to 24 190), whereas the total number of

fishery households declined by 2.8% (to 110 617). In 1995, there were around 347 000 people living in 104 000 fishery households. Families with powered vessels accounted for around one-third of the total.

Figure 3. Trends in Numbers of Fishery Workers, Households and Populations



Source: *Korean Fisheries Yearbook 1971-1995*, The Fisheries Association of Korea, 1996.

The age structure of fishery workers underwent significant changes as well during this same period (Figure 3). Since 1981 the number of fishery workers 50 years old or older has increased by 57%. By 1994, more than half of all fishery workers were between the ages of 50 and 60, while 44% were 20 to 49 years old, and just 5% were between 15 and 19 years old (Figure 4). The number of fishery workers between the ages of 15 and 29 has been on the decline since 1981, and this could have serious implications for the development of coastal fishing communities.

Figure 4. Trends in Fishery Employment by Age Group in Korea

(Persons)

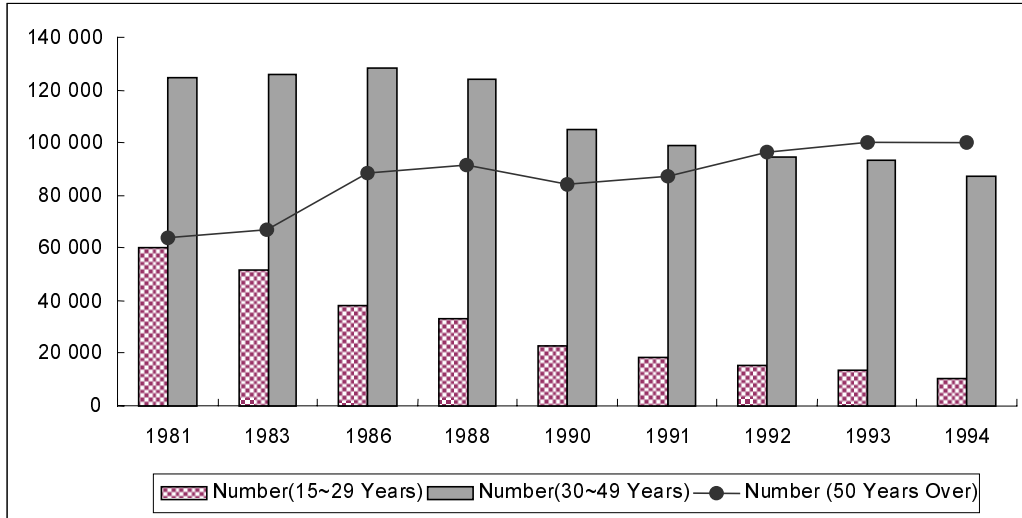
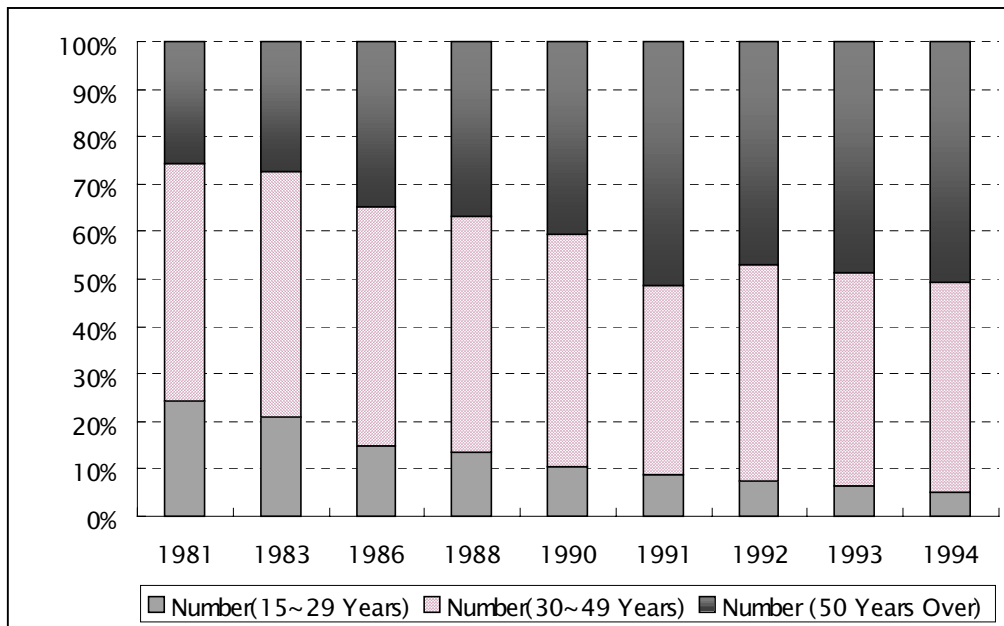


Figure 5. Trends in the Age Structure of Korea's Fishing Labour



Source: Korean Fisheries Yearbook 1982-1995, The Fisheries Association of Korea, 1996.

IV. Structural Adjustment in the Fisheries Sector and Labour Shortages

4.1 Major Policies Affecting Fishing Labour

Policies to Develop Fishing Communities and to Improve Living Standards

The consequences of unsustainable coastal development practices are serious enough to constrain the further development of Korea's fishery resources and even to threaten the very survival of coastal and off-shore fisheries. The coastal environments throughout Korea have been seriously damaged by the filling in of inter-tidal areas, municipal and industrial wastewater discharges, and accidental oil spills. A major oil spill can be disastrous for a fishery and even, in extreme cases, inflict irreversible damage on fishing grounds. The need to protect spawning and nursery grounds, and fish farms, from such threats has been recognised within Korea's coastal communities as an urgent concern. Meanwhile, aquaculture has had to compete with other industrial sectors for scarce coastal space. This struggle has led to conflicts between fishing communities and other interested parties.

The decrease in the abundance of fish stocks and the reduction in fishing areas has reduced the profitability of fishing, driving many younger workers out of fishing and forcing them to search for alternative employment on-shore. Large numbers of older workers simply opted for early retirement. A vicious cycle of poverty has taken hold in the coastal communities, especially those that have been hit hardest by implementation of the structural adjustment programmes.¹ Poverty has been further aggravated by over-crowding, especially in communities along Korea's West Coast.

In an attempt to remedy these problems, the Korean government has over the past two decades introduced various initiatives to protect its fishing grounds as well as to address the multi-dimensional problems of fishing communities.

Training Programmes

In an effort to alleviate the shortage of young fisherman, in 1981 the Korean government initiated a programme to train young people to succeed retiring fisherman. Between 1981 and 1993, 6 791 young successors were trained under this programme (Table 1). They now play an important role in the development and modernisation of Korea's fishing communities.

Training has also been offered for established fishermen. The Korea Fishing Training Centre, which was started as an UNDP/FAO project in 1969, provides technical training in distant-water fishing, as well offshore and coastal fishing. Under the Ministry of Maritime Affairs and Fisheries, education and training in fisheries are mainly provided by the Maritime and Fisheries Officials Training Institute.

Additionally, fishery education and training are carried out by the Ministry of Education through universities and secondary schools. Four universities, one college, and seven high schools have facilities for fishery education and training. The fisheries curriculum has been somewhat restructured recently, to put more emphasis on the diverse nature of the fishing industry and its role in the Korean economy.

¹. Many people living in coastal communities earn a small amount of income from unlicensed fishing, and are excluded from Government compensatory schemes.

Table 1. Numbers of people receiving training, and associated government expenditure, under the Fishery Successor Cultivation Programme in 1981-1995

	<u>Total</u>		<u>1981-1993</u>		<u>1994</u>		<u>1995</u>	
	No.	10 ⁶ KRW	No.	10 ⁶ KRW	No.	10 ⁶ KRW	No.	10 ⁶ KRW
Fishery successors ^a	7 978	93 200	6 591	66 200	641	12 000	746	15 000
Capture fishers	4 608	53 862	3 894	39 900	329	6 221	385	7 741
Aquaculture	3 254	37 822	2 612	25 415	296	5 451	346	6 956
Processing workers	116	1 516	85	885	16	328	15	303
Full-time crew ^b	543	27 150	200	10 000	100	5 000	243	12 150
Total	8 521	120 350	6 791	76 200	741	17 000	989	27 150

a. Generally, sons and daughters who are in line to inherit a business.

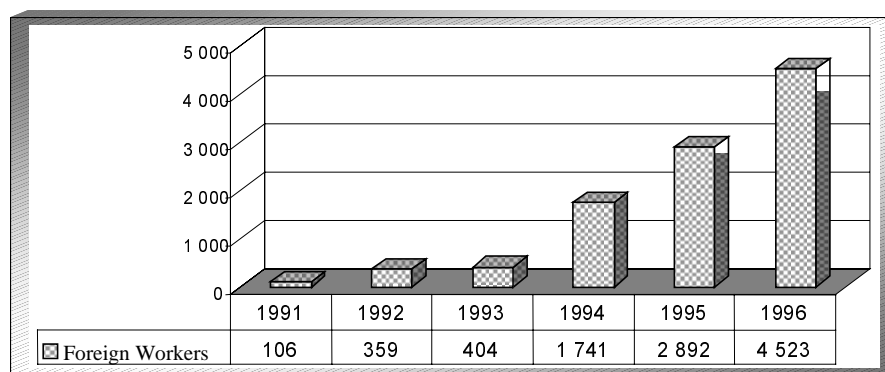
b. People other than successors.

Source: Korean Fisheries Yearbook 1995, The Fisheries Association of Korea, 1996.

Employment of Foreign Workers

To a large extent, other sectors have been able to absorb fishery workers who have left the sector. To augment the supply of fishermen in offshore and distant-water fisheries, therefore, the Korean government implemented a policy that permits the employment of foreign workers. As shown in Figure 5, the employment of foreign workers in fishing industry has been increasing steadily since 1991.

Foreign fishing workers have been recruited from China since 1991; from Indonesia, Vietnam and Bangladesh since 1994; and from Philippines and India since 1995. However, the recruitment of foreign workers may not be able to solve the chronic shortage of labour facing the Korean fishing fleet.

Figure 6. Trends in Employment of Foreign Workers in Korea's Fishing Industry

Source: Korean Fishermen Yearbook 1997.

4.2 *Relationship between Structural Adjustment and the Market for Fishing Labour*

Hard working conditions and declining profitability are causing many young fishermen to quit fishing or to migrate to urban areas. The underlying reasons for this are a combination of inadequate facilities for educating children in fishing communities, improper fishery policies and the uncertain future facing the fishing industry.

The successful implementation of a fishery restructuring policy depends upon the introduction of complementary policies, such as those to develop new skills and provide alternative employment in fish farming, food processing, and small business establishments in the fishing communities. These, together with the structural adjustment policy — *e.g.* the reduction of fishing capacity — will clearly have a considerable impact on the management of fishery manpower.

V. The Structural Adjustment Plan and Effects on Fishing Labour

5.1 *Fisheries Structural Adjustment and Management*

To prevent over-exploitation of coastal and offshore fishery resources in the future, an effective fishery resource management system is required. Several management strategies and, especially, structural adjustment programmes, have been implemented, including a scheme to reduce the number of fishing vessels. The aim of the structural adjustment programme is to reduce fishing effort, thus lessening pressure on coastal and offshore fishery resources. Under this programme, the number of fishing vessels operating in coastal and offshore waters are to be strictly controlled; displaced fishermen will be trained for other employment opportunities; and various compensatory measures will be provided. As such, the programme forms part of a long-term government policy to allow fishery resources in coastal and offshore waters to recover.

5.2 *The Fisheries Structural Adjustment Plan for the period 1994-2004*

The structural adjustment policy effectively freezes the number of fishing vessels, especially the number of trawlers, through a prohibition on the construction of new vessels. Meanwhile, all licenses must be retracted upon the retirement of either a vessel or its owner until fishing effort has been reduced to its optimum level. A programme to buy back fishing licenses has also been implemented. The Government is trying to increase public awareness of the scheme, but fishermen might find the scheme more attractive if it were also to offer alternative employment to those who wish to leave the fishery.

The programme targets a reduction of about 7 355 vessels, representing a total of 136 519 gross tonnes, by the end of 2004 (Table 2). It is estimated that some KRW 521.4 billion will have to be paid out in compensation. In addition, stow nets, long-bag nets, and stow nets on boats, which are known to have serious harmful effects to juvenile fish due to their small mesh size, will be completely eliminated from Korea's coastal waters by the end of 2004.

Table 2. Actual and expected vessel retirements and government expenditure under the Structural Adjustment Plan for 1994-2004

Segment	Units	1994-96	1997	1998	1999	2000-04	Total
Coastal	Vessels	551	135	473	-	-	1 159
	Tonnes	4 238	642	1 620	-	-	6 500
	10 ⁶ KRW	28 092	14 167	54 419	-	-	96 978
Off-shore	Vessel	77	216	257	216	1 110	1 876
	Tonnes	4 995	13 623	15 918	13 878	60 105	108 519
	10 ⁶ KRW	9 652	52 164	63 231	61 852	194 540	381 439
Other	Vessel	1 000	2 000	1 300	-	-	4 300
	Tonnes	5 000	10 000	6 500	-	-	21 500
	10 ⁶ KRW	10 000	20 000	13 000	-	-	43 000
Total	Vessel	1 628	2 351	2 030	216	1 110	7 355
	Tonnes	14 233	24 265	24 038	13 878	60 105	136 519
	10 ⁶ KRW	47 744	86 631	130 650	61 852	194 540	521 417

Source: National Fisheries Administration of Korea, 1996.

The Government's structural adjustment policy provides a national framework to establish sustainable development objectives in coastal and offshore fisheries for the 21st Century. Its eventual aim is to regulate fishing effort at a level that matches the capacity with the available fisheries resources. The permanent laying-up of excessive fishing vessel capacity is an essential feature of that policy. The policy is taking place in three stages:

- *Stage I:* During this stage, the focus was on coastal fisheries, where fishing operations are characterised by small mesh sizes and a high composition of young fish and trash fish in landings.
- *Stage II:* Currently, over-capacity in offshore fishing begins is being eliminated through a reduction in both the numbers of vessels and tonnage. The Government is co-operating with fishing co-operatives and neighbouring countries, such as Japan and China, through a multi-lateral fisheries management system for co-ordinated management of the fisheries, particularly those that involve migratory and transboundary resources.
- *Stage III:* During this stage, the level of fishing effort is to be reduced to a reasonable level by gradually eliminating over-capacity in both coastal and off-shore fishery, with the eventual result that the profitability of the fishing industry is restored and maintained.

5.3 Results of the Structural Adjustment Programme

The implementation of Korea's structural adjustment programme for fisheries got underway in 1994, after two years of study. The first stage eliminated "coastal stow nets" (similar to coastal fixed gill nets), "coastal stow nets on vessels" (similar to coastal drift nets), and "coastal long-bag nets" (similar to coastal trawlers). In 1995, large otter trawls were targeted in order to reduce fishing capacity in view of the over-exploited resources and conflicts with other fisheries. In 1996, the second stage, which focuses on the removal of offshore fishing vessels and tonnage, was implemented.

Despite these continuous efforts to reduce over-capacity, over-fishing in the Korean coastal waters is still a widespread problem. In light of the limited funds available, this structural adjustment plan for the commercial fisheries will take time to achieve its objectives. As shown in Table 3, during the three-year period from 1994 through 1996, 324 vessels (5 406 tonnes) of gross capacity were removed from the coastal and offshore fisheries, leaving a remaining total of 1 264 vessels (62 578 tonnes). As a result of the removal of these vessels, 1 666 fishermen were displaced from the coastal and offshore fisheries, or about 1% of the total previously employed.

Table 3. Numbers of Fishery Workers (W), Vessels (V) and Vessel Tonnes (T) Displaced by Korea's Structural Adjustment Programme for Fisheries in 1994-1996

Segment	1994			1995			1996			Total, 1994-1996		
	W	V	T	W	V	T	W	V	T	W	V	T
Large otter trawl	-	-	-	84	6	802	6	1	115	90	7	917
Powered purse	-	-	-	-	-	-	144	12	1 600	144	12	1 600
Diving (apparatus)	-	-	-	-	-	-	120	20	80	120	20	80
Coastal stow net	204	541	988	168	47	1 113	620	124	420	1 312	285	3 531
Coastal long-bag	15	3	13	275	55	168	(included under "coastal stow net")					
Stow nets on boat	-	-	-	30	2	27	(included under "coastal stow net")					
Total	219	54	1 001	557	113	2 110	890	157	2 295	1 666	324	5 406

Source: Fisheries Bureau of Korea, 1996

Under the structural adjustment policy, displaced fishers are entitled to compensation from the Government for the closure of fishing grounds, and the withdrawal of their fishing vessels. In the case of the coastal stow net segment, for example, the Government removed 100% of the vessels and closed the fishing grounds permanently. Compensation was paid out over three years at a rate of USD 4 166 per tonne, or between USD 27 770 and USD 41 660 a year for typical vessel of between 20 and 30 tonnes. Prior to the buy-out, average annual income per vessel had been USD 30 988 (KRW 26.34 million). Only licensed vessels with harvest records covering at least the previous three-years (1994, 1995 and 1996) were eligible to receive such compensation.

So far, the Korean fishery structural adjustment policy has given priority to the management of small-scale, coastal fisheries. This has mainly been because of their serious negative impacts on small and young fish in coastal waters and, in the case of stow nets on boat, concern for the safety of crewmembers.

Socio-Economic Effects of Fishery Structural Adjustment in the Fishing Communities

The fishery structural adjustment policy focuses on the reduction of fishing effort. However, the linkage between structural adjustment policies and localised labour shortages has critically affected fisheries management — specifically, encouraging the movement of fishermen from over-fished fisheries into ones for which it has been difficult to recruit labour. It is generally known that in most of the fishing communities the labour market continues to age and the number of female workers continues to increase. Given this situation, it may be useful to continue a structural adjustment policy aimed at reducing fishing effort.

Structural adjustment affects management policies and the conditions of fishing labour, and changes social factors exogenous to fishing communities. During the 1994-96 period, the structural adjustment plan was concerned mainly with the development of fishing communities. Under the coastal development plan, livelihoods are to be improved by developing infrastructure in fishing communities, particularly in the areas of education, health care and employment. The hope is that, the more alternative employment options are available, the easier fisherman will find it to supplement their incomes from non-fishery sources.

Currently, the incomes of fishery households are about three-quarters of the national average, which was USD 3 039 (KRW 2.58 million) in 1996. The main problem facing policy makers is that most fishermen have low levels of educational attainment, putting them at a disadvantage against others competing for jobs in other sectors. Most of fishing households own small parcels of farmland or are tenant farmers, however, and thus meet the requirements for receiving credit offered through the compensation programmes under the fishery structural adjustment policy. This programme, which has been operating since 1990, offers farmers and fishers who own less than 2 hectares of farmland, or who have an equivalent scale of fishing business or husbandry, to extend the terms of their loans and to reduce or exempt interest payments.

VI. Main Findings and Conclusions

The findings of the study can be summarised as follows:

- The implementation of Korea's fishery structural adjustment policy has been positive, to the extent that it has reduced the number of fishing vessels, thus alleviating the shortage of fishery workers in coastal and off-shore fisheries. This, in turn, suggests that structural adjustment policies should be based on an understanding of the conditions of fishing labour market, especially the mobility of fishermen.
- The fishery structural adjustment policy could have significant positive impacts, remedying the shortage of fishing workers for the coastal and offshore fisheries. However, relevant supporting programmes such as training displaced workers for alternative employment in industries such as aquaculture, food processing, and small business enterprises, must be in place if positive results are to be achieved. Additionally, the success of the structural adjustment policy depends on the multi-dimensional development and improvement of the economies of the fishing communities. Substantial government support and investment is needed, in particular to build up the necessary infrastructure.

- The current depressed state of aquatic living resources in the Korean seas is largely, if not entirely, the result of the out-dated production-oriented policies. The significance decrease in the abundance of fishery resources and the depletion of some fish species are the major driving forces behind structural adjustment. It is high time that the Korean government change its fishery policy from one that is production-oriented to one that is resource-oriented.

SPAIN

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I. The Reasons for Public Intervention

Throughout the world's seas, technological change is having a profound affect on the efficiency with which fleets are able to find and catch fish. This modernisation process is both irreversible and inevitable, driven primarily by commercial competition and government support policies. Technological change has raised the productivity of fishermen, and enabled the global harvest to remain stable since the mid-1980s at around 90 million tonnes, but it is also forcing the pace of structural adjustment.

Were the level of employment in fisheries to remain stable, with productivity increasing, growth in effort would increase. But it is by no means certain that the world's fish stocks could sustain such an increase. Indeed, at the moment rational management of the world's fisheries requires a shift of effort from the 35% of the world's fish stocks that the FAO reckons are over-exploited¹ to the 40% that are still considered under-exploited. Such a displacement will not support a large increase in total effort, but it will allow a stabilisation of maximum sustainable exploitation levels. Thus, with little scope for growth in the total harvest, and continuing technological progress, the sector will have to shed labour. The necessary path to sustainable fisheries must perforce mean a reduction of employment in harvesting.

But this reduction will not be easy to bring about. A large number of communities are dependent economically, socially, culturally — on fishing. Withdrawing government support from such communities is likely to be met by strong resistance, and in some cases even social conflict. This possibility of conflict deters policy makers from undertaking the changes needed to bring fishing capacity and effort into line with the available resources.

The need for government action is most evident in countries with a long tradition of fishing. On the other hand, these same countries can provide important policy lessons for other countries that are also trying to prevent over-fishing, while at the same time trying to maintain the competitive standing of their fleets and avoid social conflict. Spain is such a country.

II. Pressures for Structural Adjustment

Fishing is geographically concentrated in Spain: one region alone, Galicia, is home to half of Spain's fishing vessels and 41% of its fishermen (Table 8 in the Statistical Annex). Spain's distant water fleet, like those of other major fishing nations, was profoundly affected by loss of access to traditional

1. FAO, *World Status of Fishing and Fisheries*, 1996, Rome 1997.

fishing grounds in the 1970s and early 1980s. It has also not been immune from the technological changes that have radically changed the way that fishing, and fish processing, are carried out around the world.

Beginning in the mid-1970s, the with the progressive extension of national fisheries jurisdiction into 200-nautical mile exclusive economic zones, various fishing grounds where Spanish vessels had fished for decades if not centuries — notably, those off the coasts of Iceland, Canada, Argentina, Morocco, and Namibia — were nationalised, forcing Spanish fishermen to depart. Initially, Spain was also excluded from the waters of the European Economic Community, which included traditional fishing grounds around England, Ireland and France. In 1977, however, the Community established a regulatory regime, based on quotas and licenses, which enabled Spanish vessels to return to these waters, though at a lower strength than before. The regime was provisional, with a view to reaching a framework agreement on fishing. That agreement was reached in 1978 (and went into effect in 1980) and included measures such as yearly cuts in licenses and quotas.

Spain's membership in the EEC did not immediately allow for a full incorporation of its fleet into common fishing resources. That occurred only after a drawn-out, complex process. The activities of Spanish ships in EC waters were finally regulated through an EC regime of conservation and administration of the fishing resources (EEC regulation No. 170/83). Vessels engaging in specialised fishing activities (not subject to a TAC) suffered limitations in the number of authorised ships, authorised fishing periods, and so forth. And those that were engaging in fishing activities subject to a TAC had their fishing effort regulated in areas Vb, VI, VII, VIIIa, VIIIb and VIIIc. In area VII (which surrounds most of Ireland), the Spanish fleet went from 300 vessels in 1976 to 70 in 1986. The Spanish fleet was prohibited until 1996 from fishing in the Irish Box and the North Sea; it is still excluded from fishing for demersal species in the Shetland Box until the year 2002.

III. Public Intervention Programmes in Spain

In order to ease the burden of adjusting to this ever-changing situation, the Spanish Government adopted a suite of measures: unemployment subsidies, training programmes, public investment and transfers to new sectors, such as fish farming, fish processing and coastal tourism. These actions were supported by the European Union institutions, local or regional institutions, and the Spanish Government. Frequently, funding was shared among different authorities and the private sector.

Table 1 lists Community transfers to the Spanish fishing sector over the eight-year period 1986-1993. Overall, Community aid during these years amounted to ECU 533 million. The largest single category of expenditure was for the definitive withdrawal of fishing vessels from Community waters; this programme, which has been jointly funded by the EEC and by the Spanish Government, has been fundamental to adapting the Spanish fishing effort to the new reality. Including both Community and Spanish funds, ESP 48.3 billion (ECU 288 million) was paid out for this purpose between 1989 (when the programme was initiated) and 1995 (Table 2). Moreover, annual expenditures have grown phenomenally, and were more than 10 times larger in real terms in 1995 than in 1989.

Table 1. Community Aid to the Spanish fishing industry, 1986-93

(Millions of ECUs)

Area	Amount	%
Harvest fishing		
Temporary withdrawal	37.15	7.0
Definitive withdrawal	138.47	26.0
Mixed companies	61.64	11.6
Temporary fishing	1.50	0.3
Construction	80.33	15.2
Modernisation	44.01	8.3
Coastal fishing	2.53	0.5
Experimental fishing	6.44	1.2
Aquaculture		
Construction	34.19	6.4
Modernisation	17.42	3.3
Extension	9.77	1.8
Other objectives		
Artificial reefs	4.62	0.9
Harbour equipment	9.91	1.9
Processing and marketing	72.55	13.6
Marketing research	1.97	0.4
Specific measures	9.42	1.8
Total	531.92	100.0

Table 2. Evolution of Aid for the Definitive Withdrawal of Fishing Vessels, 1989-95

Units	Year						
	1989	1990	1991	1992	1993	1994	1995
Aid ^a ESP million	1 058	1 165	2 029	8 862	9 269	9 476	16 486
Index 1989 = 100	100	110	192	838	876	896	1 559

a. Total of EU plus Spanish Government expenditures.

Table 3 shows investment and incentives for the construction, modernisation and withdrawal of the Spanish fleet. This aid, totalling ESP 57.1 billion (ECU 340 million), has played a fundamental role in facilitating the adaptation of the fleet, accounting for approximately one-third of total investment.

Table 3. Investment in, and State Aid for, the Construction, Modernisation and Withdrawal, of Spanish Fishing Vessels: Total for the Period 1989-95

Purpose	Number of vessels benefiting	Billions of pesetas		
		Total Investment	Aid	
			EU Contribution	Total Aid
Construction	842	116.5	10.8	22.8
Modernisation	1 942	51.5	5.8	11.5
Definitive withdrawal	596	–	11.5	22.8 (or 48.3?)
Total	3 380	168.0	28.1	57.1

Turning to social expenses borne by the public sector, Table 4 shows the numbers of people receiving different types of fishing-related pensions in each year from 1985 through 1996. The number of recipients increased steadily over this period (at an annual rate of 1.7%), or 21% overall. Comparing the composition of the pensions between 1996 and 1990 (Table 5), the only notable change was in retirement pensions. The rise in both the share and the number of retirement pensions is mirrored in the reduction of employment and unemployment levels in the fishing sector.

Table 4. Numbers of Spanish Fishers and Dependants Receiving a Fishing Pension, 1985-1996

1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
67 793	69 371	71 888	75 117	77 767	80 024	82 703	92 023	97 448	94 958	81 966	81 997

Table 5. Composition of Fishing Pension Beneficiaries in 1996

Type of Pension	Number of Recipients	Percentage	
		1996	1990
Disablement	14 431	17.6	19.9
Retirement	36 981	45.1	41.8
Widows'	26 977	32.9	34.0
Orphans'	3 115	3.8	3.7
Family protection	493	0.6	0.6
Total	81 997	100.0	100.0

Both public contributions to the fishermen's unemployment system and the number of recipients (Table 6) have been declining since the early 1990s — the number of people receiving unemployment benefits in 1996 was less than two-thirds that in 1992 (see also Table 9 in the Statistical Annex), reflecting a slowdown in sectoral unemployment levels.

Table 6. Evolution of the Numbers of People Receiving Fishing-Related Unemployment Benefits, 1986-1996

Years	Total numbers of beneficiaries	of which:	
		Benefiting from a contributive scheme	Benefiting from a subsidised scheme
1986	13 900	10 408	3 492
1987	12 603	8 229	4 374
1988	11 878	7 981	3 897
1989	13 270	9 372	3 898
1990	14 303	10 408	3 895
1991	15 962	11 771	4 191
1992	16 867	11 957	4 910
1993	15 742	9 981	5 761
1994	14 209	9 126	5 083
1995	12 158	7 616	4 542
1996	10 958	6 810	4 148

Table 7. Occupational Training and Social Promotion Courses Offered, 1985 through 1996

Years	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Occupational training												
Courses	174	278	194	201	506	626	649	644	922	1 101	1 247	1 290
Participants	5 381	7 380	4 839	4 400	7 728	9 689	9 819	10 635	15 558	18 266	21 000	21 037
Social promotion												
Courses	108	124	118	97	89	85	88	102	137	148	178	131
Participants	3 592	3 078	2 765	2 146	2 523	2 592	3 234	3 281	2 740	3 171	3 407	2 660

Occupational training, by contrast, expanded over the same period (Table 7). Indeed, the number of participants almost quadrupled. These courses are fundamentally important for fishermen, because they have a direct impact on working conditions. For example, 43% of the courses taught in 1996 were related to maritime safety.

VI. The Consequences of Public Intervention Programmes

The measures described above formed a substantial part of the administrative action in the 1985-96 period. What have been the consequences for the employment, production and productivity in the Spanish case? Has the existence of this support:

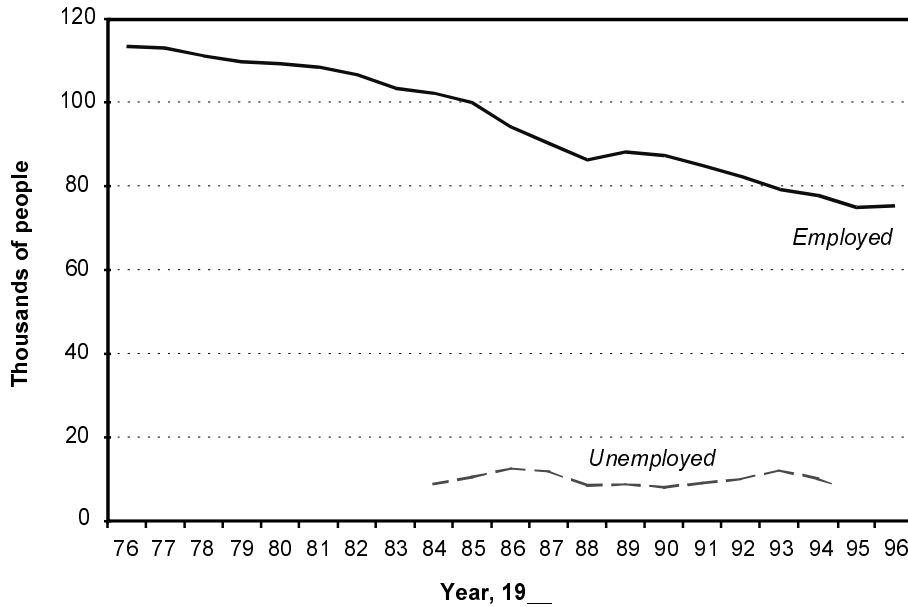
- Allowed the necessary reduction of employment?
- Allowed production to be maintained?
- Allowed productivity to be maintained?
- Allowed enough social stability to prevent social crisis?

If all of these questions can be answered in the affirmative, we will have some evidence that the mechanisms used have had positive effects in the medium term for fishing activity sustainability, society and the economy, where this problem has its origin.

To answer the last question first: Spain has not experienced a major social crisis in fisheries. Although there have been some localised problems, no regions have suffered large-scale out-migration, general social crisis or sharp falls in living standards. Thus far, the processes of adapting to over-capitalisation and over-employment in Spain have taken place gradually and have usually been accepted by society.

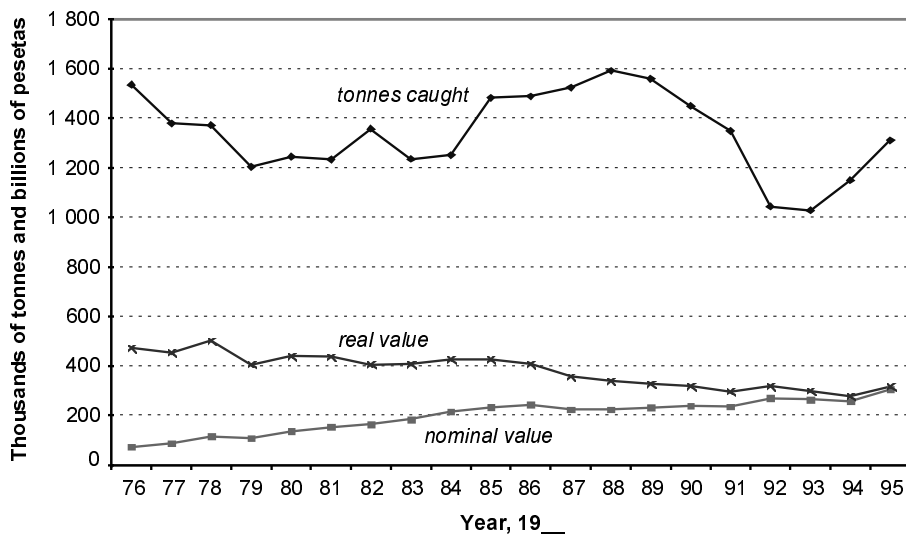
Some figures help in answering the other questions, starting with employment. Since the 1970s, employment in fisheries has fallen significantly but gradually (Figure 1 and Table 9 in the Statistical Annex). In this respect, Spain's experience has been similar to that of other EU Member states. Yet the number of people registered as unemployed in the sector remained more or less constant. The conclusion can be drawn that, as the harvesting sector shed labour, other economic activities were able to absorb the displaced workers, and most fishermen did not remain unemployed.

Figure 1. Employed and Unemployed Spanish Fishermen, 1976-96



It was noted previously that fishing possibilities available to Spain were significantly reduced compared with its fleet’s capabilities in the 1970s, following the progressive implementation of 200-mile zones by the world’s coastal nations. Landings by Spanish vessels then fell again from 1987 to 1992, after Spain joined the European Union. But the fleet was able to adapt to the new situation, and the total volume and (nominal) value of the catch has been increasing since then (Figure 2 and Table 10 in the Statistical Annex).

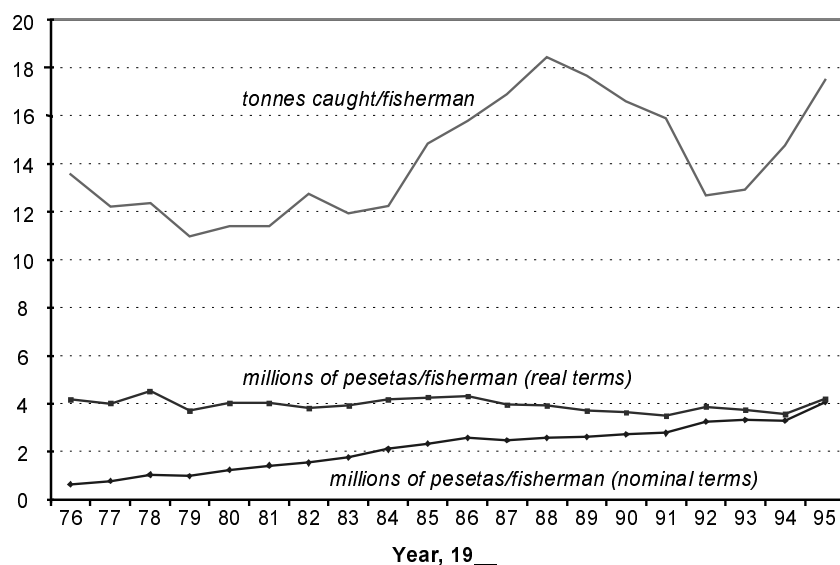
Figure 2. Evolution of Catch and Value in Spanish Fisheries



The recent increase in landings has had only a small impact on consumer prices. As shown in the last column of Table 10 (annexed), the evolution of the average index of wholesale prices for fish landed in Spain by the Spanish fleet has remained more or less constant in real terms. Observed fluctuations in real prices seem to be related more to currency devaluations (for example, as occurred in 1992) than with variability in landings. This has been the case especially since 1986, when Spain's internal market was almost totally integrated into the wider European Economic Community.

Finally, Figure 3 (and Table 11 in the Statistical Annex) shows the evolution in labour productivity. Catch (in tonnes) per employed fishery worker began an upward trend in 1992, and by 1995 had almost returned to 1988 levels. Measured in millions of nominal pesetas per worker, productivity has steadily increased; in real terms, however, it has remained fairly constant.

Figure 3. Employment Productivity in Spanish Fisheries



Conclusion

To conclude, public intervention has allowed a gradual and non-traumatic adaptation of Spain's fishing sector, and moreover it has helped to maintain levels of production and labour productivity in the medium term, with significant reductions in employment levels.

Statistical Annex

Table 8. Distribution of the Spanish Fishing Fleet by Region as of 11 January 1995

Region	Numbers of fishing ports	Fishing vessels		Fishermen	
		Numbers	%	Numbers	%
Basque Country	18	610	3.0	6 092	7.5
Cantabria	9	276	1.4	2 133	2.6
Asturias	22	628	3.1	2 498	3.2
Galicia	74	10 187	49.8	33 043	40.7
Andalusia	33	2 794	13.7	15 105	18.7
Murcia	4	193	1.0	1 708	2.1
Valencia	22	1 704	8.3	5 345	6.6
Catalonia	35	1 681	8.2	6 593	8.1
Balearic Islands	16	777	3.8	1 602	1.9
Canary Islands	41	1 549	7.6	6 500	8
Ceuta	1	59	0.3	390	0.5
Melilla	1	9	—	67	0.1
Total	276	20 467	100	81 076	100

Table 9. Employed and Unemployed Spanish Fishermen, 1976-96

Years	Employed			Unemployed
	Full-time	Part-	Total	
1976			113 241	
1977			112 902	
1978			111 005	
1979			109 589	
1980			109 258	
1981			108 414	
1982			106 584	
1983			103 494	
1984			102 156	8 900
1985			99 975	10 500
1986			94 246	12 500
1987			90 273	11 900
1988	80 349	5 950	86 299	8 500
1989	79 195	9 004	88 199	8 800
1990	78 407	8 944	87 351	8 100
1991	75 506	9 332	84 838	9 100
1992	73 246	9 053	82 299	10 000
1993	70 638	8 731	79 369	12 100
1994	69 386	8 576	77 962	10 100
1995	66 758	8 251	75 009	7 200
1996	67 137	8 29	75 434	7 400

Source: Ministry of Agriculture, Fisheries and Foodstuffs, General Office of Maritime Fishing.

Table 10. Annual Catch, Value and Price Statistics for Spain

Year	Catch (tonnes)	Nominal Value (millions of ESP)	Deflator (dimensionless)	Real Value (millions of constant 1996)	Real Price Index (constant 1996 Pesetas)
1976	1 535 176	73 022	6.468	472 306	127.5
1977	1 379 360	87 200	5.197	453 178	136.1
1978	1 372 605	115 766	4.333	501 614	151.4
1979	1 203 582	108 196	3.750	405 735	139.7
1980	1 245 211	135 647	3.246	440 310	146.5
1981	1 234 758	154 317	2.832	437 026	146.7
1982	1 357 065	163 920	2.476	405 866	123.9
1983	1 236 230	184 251	2.208	406 826	136.4
1984	1 252 366	214 990	1.984	426 540	141.1
1985	1 482 843	233 720	1.823	426 072	119.1
1986	1 488 528	242 808	1.676	406 946	113.3
1987	1 524 905	223 891	1.592	356 434	96.9
1988	1 592 658	223 343	1.519	339 258	88.3
1989	1 559 800	230 110	1.422	327 216	86.9
1990	1 450 000	238 892	1.332	318 204	90.9
1991	1 350 000	235 240	1.258	295 932	90.8
1992	1 043 147	268 449	1.187	318 649	126.6
1993	1 027 387	264 374	1.130	298 743	120.5
1994	1 150 123	256 349	1.085	278 139	100.2
1995	1 311 595	305 445	1.036	316 441	100.0

Source: Ministry of Agriculture, Fisheries and Foodstuffs, General Office of Maritime Fishing.

Table 11. Labour Productivity in Spain's Marine Harvest Fisheries

Year	Tonnes	Millions of ESP	Millions of ESP (real)
1976	13.6	0.6	4.2
1977	12.2	0.8	4.0
1978	12.4	1.0	4.5
1979	11.0	1.0	3.7
1980	11.4	1.2	4.0
1981	11.4	1.4	4.0
1982	12.7	1.5	3.8
1983	11.9	1.8	3.9
1984	12.3	2.1	4.2
1985	14.8	2.3	4.3
1986	15.8	2.6	4.3
1987	16.9	2.5	3.9
1988	18.5	2.6	3.9
1989	17.7	2.6	3.7
1990	16.6	2.7	3.6
1991	15.9	2.8	3.5
1992	12.7	3.3	3.9
1993	12.9	3.3	3.8
1994	14.8	3.3	3.6
1995	17.5	4.1	4.2

NEW ENGLAND AND THE MID-ATLANTIC REGIONS

An Appraisal of the Social and Cultural Aspects of the Multi-Species Groundfish Fishery in New England and the Mid-Atlantic Regions¹

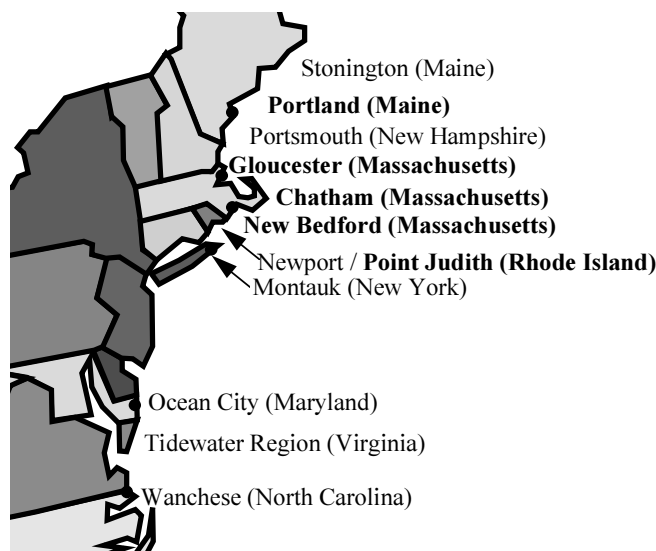
I. Executive Summary

Fishing communities of New England and the Mid-Atlantic, particularly those dependent upon the Multispecies Groundfish Fishery, are experiencing a social and economic crisis brought on by regulatory changes. Amendments No. 5 and No. 7 to the Multispecies Groundfish Management Plan, Marine Mammal Protection Legislation has led fishers and their families to make several, often radical, adjustments to their lifestyles in order to maintain their attachment to the nation's marine resources and preserve their independence from low-wage sectors of the economy. Those adjustments are neither wholly new nor innovative nor desperate responses to declining fish stocks. Fishers and their families consider the situation at least as much political as biological. They disagree with State and Federal assessments of the conditions of stocks and trace the origins of their problems to policies fashioned during the 1970s and early 1980s that encouraged low-cost loans, technological advances, and unlimited entry into the fishery. The over capitalisation that occurred, fishers argue, laid the basis of the economic and social disruption and the associated crisis of legitimacy of fishers toward national and regional management agencies.

Aguirre International was engaged to report on the social and cultural aspects of the MGF by ascertaining community-dependence on the MGF, providing information on the demographics of the fishing industry, identifying social science data bases that could be used in follow-up studies and developing a classification system that will aid in predicting the social impacts of the changing fishery regulations on fishery-dependent communities.

Using a variety of Rapid Ethnographic Assessment Procedures (REAP), including in-depth interviewing, focus groups, secondary source data collection, and pile-sorting tasks, social and economic aspects of the MGF fleet were identified and described. Those aspects were then presented in the context of five primary and nine secondary ports along the Atlantic coast from Maine to North Carolina. Ports were selected using a combination of information derived from field visits, licensing data, telephonic interviews, with individuals in the local area, and consultation with national and regional National Marine Fisheries Service representatives. Figure 1 shows the primary ports (in bold) of the multispecies groundfish fishery selected for this study.

1 . The National Marine Fisheries Service (NMFS) has provided this report as a contribution to the OECD Study. It was initially prepared in 1996 by Aguirre International of Bethesda, Maryland, a private consultant, under contract to the National Oceanic and Atmospheric Administration (Contract Number 50-DGNF-5-00008). The conclusions and views expressed in this paper do not necessarily represent the policies of the National Oceanic and Atmospheric Administration or of other agencies of the United States Government. For further details see endnote.

Figure 1. Primary (In Bold) and Secondary Ports of the Multispecies Groundfish Fishery

The secondary ports were, in some cases, more regions than individual ports. Coverage of the ports varies widely, primarily because groundfishing has become more concentrated in recent years. Ports, which seemed to be heavy groundfish ports based on licensing data, were found to be sites of little groundfishing activity. The nine secondary ports/regions were:

- Stonington and the Down East region of Maine.
- Portsmouth, New Hampshire and Southern Maine Ports.
- Provincetown, Massachusetts.
- Newport, Rhode Island.
- Montauk, New York.
- Ocean City, Maryland.
- Tidewater Region, Virginia (Hampton Rhodes, Newport News).
- Wanchese, North Carolina.

In their attempts to maintain the fishing lifestyle, most fishermen have adjusted by experimenting with new fisheries, dealing with reduced incomes by rotating or laying off crew (keeping individual shares stable), supplementing incomes with casual shore employment or with the labour of their spouses, or curtailing consumption practices. While moving into alternative fisheries has been the most preferred response, most of the larger vessels of Gloucester and New Bedford have become too specialised and too dependent on family networks for staffing vessels to shift into other fisheries without significant capital investments. Small and medium-sized vessels (30' to 75') have had more success moving to alternative fisheries, yet often have been met with hostility as they attempt to enter fisheries dominated by families and fleets that have been in those fisheries for generations. Lobstermen of Maine, for example, are firming up their territories in response to current and anticipated movement of groundfish fishermen into their fishery. Other states have begun limiting entry, as their legislator's fear those displaced from the MGF will move into others waters.

Those who have moved into shore-based jobs have tended to take positions that are related to fishing or to seafaring (*e.g.* working marine repair or piloting passenger or cargo vessels). The aquaculture

retraining programmes designed to place fishers into shore occupations have not met with great success. Fishers view aquaculture retraining efforts as flawed because they do not demonstrate an understanding of culture of fishermen as hunters as opposed to farmers.

From the community studies, five variables have been determined that predict dependence on the MGF. These are:

- The degree to which fishers in a port are isolated or integrated into alternative sectors of the economy or alternative fisheries. The more isolated or socially and culturally cut off fishers are from the wider society, the more dependent they tend to be on fishing.
- Type of vessels that characterise the fleet. Those fleets that have large, highly specialised vessels tend to be more dependent on the MGF than those with smaller vessels or mixed vessels.
- Degree of specialisation in the MGF. The more specialised the more dependent.
- Percentage of population involved in fishing or fishing related activities.
- Competition and conflict between fleets within a port were associated with high levels of dependence.

Based on the variables in the five primary ports, New Bedford was determined to be the most dependent on the MGF followed by Gloucester, Portland, Chatham, and Point Judith.

Among the secondary ports, Stonington, Wanchese, and Montauk, while heavily dependent on fishing in general, were less dependent on the MGF in particular. However, the crisis within the MGF was relevant in all ports because groundfishing is a crucial part of many fishers' annual rounds and because other fishers were concerned that displaced groundfishers would move into their fisheries or receive heavy Federal quotas that would drive smaller fleets out of business.

Fishers interviewed identified 11 critical issues/problems that they believe were of importance to understanding the current and past adjustments to crises and to understanding the probable future of commercial fishing in the United States. For the fishers, these issues are:

- Fishers respond to crises based on past experience and by moving into new fisheries and new territories as opposed to moving into other sectors of the economy.
- Current regulations are confining them to specific fisheries, curtailing their abilities to remain flexible by responding to changing fish stocks.
- Fishers view the process of regulating the fisheries as biased, based on inaccurate data, and suffering from a lack of effective communication links between fishers and fishery managers.
- The institutional responses, primarily the vessel buy-back programme and the retraining programmes, have been unsuccessful.
- Crew reductions, days-at-sea limitations, and competition within and between fleets have caused safety problems.

- The current crisis originated with the over capitalisation processes of two decades ago.
- Fisheries are regulated unevenly, with some species too tightly controlled while others are not controlled enough.
- Competition between ports has reached epidemic proportions.
- In designing regulations, fisheries managers often fail to take into account the full effect of regulations on the families and households of fishers.
- Federal regulators have not addressed the growth in imports of fishery products and their impacts on ex-vessel prices of fishers in the United States.
- Credit and insurance have become severe problems within the fisheries, with not only banks and insurance companies refusing to finance and cover vessels, but also trip suppliers, marine repair personnel, and other related businesses backing away from the fishing industry.

These problems, combined, have resulted in fishers relying more on their own internal resources, particularly alternative forms of capital that are available to them by virtue of their membership in meaningful social groups and enclaves. Efforts to address the crisis in the MGF have come from many sources, including fishing organisations, city and state governments, the Federal government, and individual fishers and their families. While there are a number of programmes underway, there is no well co-ordinated effort. Success of these programmes is heavily dependent on a better understanding of the nature and extent of the crisis and the unique characteristics and adaptive strategies of fisher families and communities across the MGF.

Background on History, Issues and Findings

Fishing households relying on the Multispecies Groundfish Fishery (MGF) of New England and the Mid Atlantic are facing a crisis in their communities. Declines in groundfish stocks, and the resultant restrictive Amendments No. 5 and No. 7 to the MGF management plan puts many fisher and supporting occupational households in a state of social and economic crisis. The general perception in the MGF fishing communities is that the crisis is the result of recent regulations that dramatically restrict their number of days at sea. These regulations are already hampering the ability of many fishers to survive economically. Yet, causes for the present fishery crisis are complex, include regulation impacts and declines in traditional groundfish stocks, but are also linked to less understood community-level issues and processes and that are the basis of this report. For example, increased costs of fuel, equipment repair, insurance, dockage fees, as well as other factors adversely impact those individuals relying on the MGF. This results in a breakdown of co-operative fishing units, associated formal and informal coping networks, and forms of capital (*e.g.*, social, human, and cultural).

A common perception among fishermen in the New England and Mid-Atlantic MGF, similar to other regions and fisheries, attributes restrictive government regulations for problems associated with the management of fishery resources (Sinclair 1983; Durneberger 1995; Maril 1993; Griffith 1996; Johnson and Orbach 1996). Disputes between fishers and managers over the cause of fishery decline date back to governmental intervention in the late 19th century codfish fishery of Newfoundland (Hewitt 1993). Fishers also commonly complain that policy responses to declines in fish stocks and other problems with marine ecosystems (*e.g.* red tide) are often too restrictive and overcompensatory, often being derived purely from political motives (Fritchley 1993). In this study, we elicited numerous responses that

suggested that fishers believe the current decline in MGF stocks dates back to misguided government policies of the late 1970s where low-interest loans provided to fishing families overcapitalised the fleet, encouraged outside investment in fishing by “absentee owners,” led to routine overfishing and stressed marine resources.

It is unlikely that the cause of the recent and current declines in fish stocks can be traced to a single misguided policy or even set of fishing practices. The collapse of fishery resources, historically, is neither unique nor necessarily permanent (McEvoy 1986; Aranson and Felt 1995). Fisheries near collapse have, in some cases, recovered to a level of sustainability (Alverson 1987). In the New England fisheries, in fact Doeringer, Moss, and Terkla (1985: 20) report that during the mid-1960s: “The decline in the stocks greatly alarmed the New England offshore groundfish fishermen.” As one Gloucester fishermen said, “There will be no fish and with no fish no boats and no fish plants.” In the view of another, “years ago we used to get capacity loads, now all we are doing is scraping the bottom. The industry as a whole has declined to a disaster point.” Less than a decade later, crewmen on fishing vessels in Gloucester and other parts of New England had experienced their incomes rise to levels that were far higher than previously, and the passage of the Magnuson Act ushered in a brief period of prosperity for fishers that surpassed any of the cautious hopes of fishermen, boat owners, and processors voiced publicly (Doeringer, Moss and Terkal 1986: 26).

There have been cases, of course, where declines in fish stocks have been severe and complete (Hutchings and Myers 1995). Causes for these declines, again, are rarely due to single causes, but include overcapitalisation, unrestricted fishing with highly productive fishing technologies, weak management structure, poor enforcement of fishing restrictions, and environmental factors such as habitat destruction from coastal development and pollution, oceanic processes (El Nino), and the fishing practices of foreign fleets (Warner 1977). Several of these factors combined to bring about the utter collapse of the Peruvian anchovy fishery (McCay and Acheson 1987; Dobyns and Doughty 1978).

Blaming management for fishery collapse, from ineffective enforcement or overly restrictive regulations, stems in part from the perception, common among fishers, that managers rarely respond quickly to the plights facing fishers and fisheries (Dyer and McGoodwin 1994). For the past two years, the North Carolina herring fishery has been closed on 15 April, or between two and six weeks prior to the end of the herring run (Griffith 1996). Responding to these restrictions, all but one pound-net herring fisher in Albemarle region agreed to cut the number of nets in the fishery in half, if only fishery managers would allow them to fish in May. Herring fishers we interviewed in the spring and summer of 1996 complained that repeated appeals to fishery managers concerning these voluntary, self-imposed restrictions had been met with silence.

In late April, one herring fisher invited us to examine his pound-nets—which were catching nearly 10 000 pounds of herring that day that he had to release—in an attempt to convince local state fisheries biologists that the herring stocks had recovered. State fisheries biologists, who refused to examine these late season catches, explained that the stocks needed four seasons of healthy recruitment to recover to previous levels, although they expressed some surprise that the nets, in late April, were catching 10 000 pounds of herring per day. Despite this surprise, they did not bother communicating directly with the herring fishers, preferring instead to communicate with university faculty working on the issue, and refused to examine the daily catches themselves.

Similar to the herring fishers’ views of fishery managers, fishers we interviewed in New England viewed the National Maine Fisheries Service as having outdated stock information nearly two years behind actual stock conditions, in part due to the transition from dockside surveys to fishers’ log reporting methods. They also were concerned that data from the current log book system was not even being integrated into stock assessment calculations. The case of the herring fishers is but one illustration of

misunderstanding, miscommunication, and misinformation both within the fishing community and the management context leading to disputes between fishers and fishery managers. Blaming fishery managers for declines in fish stocks seems particularly unfortunate, for declines, as just noted, rarely derive from single causes.

In the same way that complex sets of factors contribute to fluctuations in fish stocks, generally restrictions on fishing practices also derive from several resources. Again, when we examine the historical record in New England and elsewhere, we find that rarely are single causes to blame for either problems with marine ecosystems or the resulting political responses to these problems. Policies designed to address declines in fish stocks and associated declines in fishing incomes, whether restrictive measures such as Amendment No. 7 or compensatory measures such as occupational retraining programmes, may originate from strictly biological concerns yet may also originate in conflicts between user groups (whale watchers and commercial netters) or from differential claims on the resource. In 1891, for example, we read in a letter to the state capitol from Roanoke Island, North Carolina:

“The people here are poor and depend entirely upon the waters for support, in a way of fishing and oystering. But the Virginia men are down here and have taken entire possession of all the oyster grounds, their boats are much larger than those here, and when these are at work the Virginians will run down upon them and tear them up; and when they try to retaliate it is useless, for they are armed to the teeth with Winchester rifles and some have 36 lb. guns. Unless something is done to stop their dredging, these people will be in a starving condition in twelve months, for it will be useless for the fishermen to put in any shad nets, for these Virginians pay no attention whatever to their nets; they run their boats through and tear them up, and the consequence will be these nets will be all cut to pieces, and no fish caught, and when there are no fish caught there will be no bread.”

This user conflict, which over a century ago precipitated tightening of oystering regulations, resulted from both perceived declines in oyster stocks from larger vessels from the Chesapeake entering North Carolina waters as well as from the actual space problems and physical confrontations on the water. No one familiar with these cases should be surprised to find the problems facing today’s fishers as least as complex.

Information on the dynamics of impacted fish stocks has been a priority since 1964 with the initiation of annual groundfish surveys by the Bureau of Commercial Fisheries. Variations in MGF stock numbers, recruitment, and related measures have been tracked for decades (Wright 1987). A series of increasingly detailed quantitative models were developed that consider interactions among species. Lamentably, application of these models has not translated into management policy capable of preventing the decline of target groundfish species (NMFS 1993). Applying biological information on stocks to management has failed to check the ongoing decline in New England groundfish fisheries partly because it has not been matched with equally useful community-level information on the dynamics of user groups (Poggie, personal communication 1996). Because such information has not been available to integrate into effective fishery regulations, the application of such concepts as Optimum Sustainable Yield (OSY) to the MGF is dubious at best.

Another difficulty facing managers is the decline in federal funding for the collection of biological information on the MGF. This will necessitate developing new avenues of information flow to track the state of the fishery. The most rational source of new, improved information is through co-operative endeavours between fishers and managers. Such endeavours require updated comprehensive information on the state of fishing communities, and an accurate reporting by fishers of catch and related observations on the state of both stocks and habitat. From the community perspective, a comprehensive

SIA followed by an ongoing series of periodic updates can best provide users and managers with the information needed to develop co-operative, sustainable management scenarios for the MGF.

The common perception of over-regulation or misguided regulation among fishers is compounded by belief that fishery managers often fail to account for the community impacts of fishery regulations. Fricke (1985) proposes that fundamental concerns of managers are not to respond to critical community issues but are rather to avoid “adverse user and public comment, further deterioration of the resource, and challenges to agency policy” (pages 47–48). Poor communication between users and managers, lack of co-management and other co-operative strategies, and reliance on ineffectual public hearing processes are also blamed for the collapse of fisheries resources (Pinkerton 1989; McGoodwin 1990). Reasons proposed for ineffective communication include inflexibility in the management structure (Fricke 1988), lack of a common language and world view (Smith 1988), and lack of an ecosystem management approach that “links changing scientific understanding of a region with evolving human values and needs as a basis for making [management] decisions” (Burroughs and Clark 1995: 660). Many of these driving factors explain the critical social and cultural aspects of the MGF.

The MGF fisheries have not escaped the historical trends of social and economic decline facing fisheries on all coasts of the United States. What is particularly alarming about the decline of this fishery is that it has previously been so sustainable, characterised by a fishing history that has made it part of the American cultural landscape. Many Americans are familiar with the symbol of the Gloucester fishermen, representing generations of fishing tradition dating to 1623 (Vickers 1995). North of New England, the ecologically contiguous Newfoundland codfish fishery, now in a state of collapse, has even more historical precedent, with fishing dating from 1504 (Quinn 1979). Despite these many centuries of sustainable fishery use, recent management measures on the Atlantic codfish, the prime target species of the MGF, have resulted in a moratorium on the Newfoundland fishery while surveys in Norway, Iceland and Scotland reflect greatly reduced numbers of larger codfish (FAO 1990).

Outcomes of the Newfoundland experience have been tragic, with entire communities being forced to abandon both their livelihood and communities as the fishery was shut down. Some predict that this fishery, which lasted for nearly half a millennium, may never recover. Certainly, the social and human capital lost during this moratorium will be difficult to replace (Felt, personal communication 1996). At the 1996 meeting of the Maine Fisherman’s Forum, public comments by fishery leaders, particularly fishers wives, reflect the view that they do not want to replicate the “Canadian model”.

While the MGF is in a crisis state, it may still be possible to recover the fishery without impacting the communities to a degree beyond recovery. This study provides baseline social and cultural information that gives direction to managers in resolving the current crisis in a way that can minimise the negative impact to fisher communities. However, this will not happen without innovative ways of collecting and applying necessary biological and community-level information to the management of the MGF. Innovation includes willingness to experiment and adapt new management measures, timely use of data, and engaging significant outside (community-based) involvement (Burroughs and Clark 1995). One option may be the employment of an ecosystem approach to management. Such an approach would require better flow of information between users and managers, and the proactive integration of the human dimensions of management.

This report represents a first step towards a holistic systems-based approach to management. When combined with a follow-on SIA, it should provide sufficient detail for managers and users to initiate a more sustainable system for the management of the MGF.

II. Synthesis of Findings from the Community Studies: A Comparative Analysis

A. *Dimensions of the Problem*

New England and Mid-Atlantic fishing communities, particularly those dependent upon the Multispecies Groundfish Fishery (MGF), are experiencing severe social and economic uncertainty—both real and perceived—from recent regulatory changes and legal challenges to their way of life. Declines in groundfish stocks, Amendments No. 5 and No. 7 to the Multispecies Groundfish Fishery Management Plan, Marine Mammal Protection Legislation, coastal access conflicts, threats and promises of limited entry, licensing moratoria, season closures, net bans, the extension of current quotas and the development of Individual Transferable Quotas (ITQs)—have created an environment where fishermen incorporate *anticipated* regulations into their fishing and survival strategies.

What gears to use, which species to target, where to fish, and how to pioneer new and maintain old markets for their catch no longer depend primarily on fishers' ethnobiological understandings of fish and ecological cycles nor their economic calculations. Now fishers modify their interactions with the marine environment based not only on the availability and robustness of fish stocks but on their understandings and evaluations of the political process (including its legitimacy), state and federal enforcement capabilities, and past experiences with federal and state interventions in their fishing styles. What they perceive was once a largely solitary existence, dependent on seasonally variable, daily interactions with the sea has become a legal tangle that forces them, their family members, and other members of their social support networks into uneasy organisations and coalitions that engage the state in seemingly ever more hostile discourse.

This crisis of uncertainty and anticipation is neither restricted to the ports of Massachusetts, Maine, or other parts of the New England and Mid-Atlantic regions, but constitutes a complex of social, cultural, and ecological problems facing commercial fishing as an industry and as a way of life that is central to the identities of coastal families, neighbourhoods, and communities. The deep investments that fishing families make in cultural capital—or those symbolic elements of their ways of life that lend identity and meaning to their actions, facilitating well-being and productive membership in the nation and their communities—have been chronicled in articles, essays, and popular and academic books for several decades (*e.g.* Acheson 1987; Garrity-Blake 1994; Dyer and McGoodwin, eds. 1994). These investments are encouraged, realised, and facilitated by extensive networks and social relationships that link fishing families to seafood dealers and processors, marine suppliers, harbour masters, government agencies and enforcement personnel, and a variety of service providers within the financial, insurance, and real estate (F.I.R.E.) sectors of the U.S. economy.

Families that depend on fishing and the seafood industry along the eastern seaboard of the United States are economically, socially and psychologically stressed because of declining fish stocks, increased state and federal government regulation, coastal development and gentrification, and conflicts between different populations of fishermen. During 1995, for example, gill nets were banned in Florida waters and moratoria on licenses were put into effect in North Carolina and for fishers in the multispecies groundfish fishery of the Northeast and Mid-Atlantic regions (from the Gulf of Maine to Cape Hatteras). Several other states have been experimenting with new fishing licensing systems, limited entry or other kinds of reduced access programmes, and various closures of fishing regions for environmental or biological reasons (*e.g.*, designated nursery areas). Even as ground fishermen witness fishing stocks dwindling and habitats continuing to shrink or become polluted, fishing interests in other states and other countries are considering or putting into place measures to restrict access to fisheries which displaced ground fishermen might enter.

Fishing families have responded to these changes in a variety of ways, including experimenting with other fishing methods and gears, taking alternative positions in other fishing enterprises (*e.g.*, moving from captaining their own vessels to working as crew on others), leaving fisheries for shore-based jobs, establishing aquaculture operations, or moving to other states with more relaxed regulations. Attempts to maintain the fishing lifestyle often involve taking part-time or full-time jobs, within fishing and fishing related fields (at marinas or dry dock facilities) as well as in the various segments of the labour market that are not related to fishing. Family members' contributions to these efforts are often substantial, with working wives, mothers, daughters, and sons providing expenses during seasonal or occasional downturns in fishing or fish marketing activity.

This occurs at a time that labour market opportunities in construction, manufacturing and other economic sectors where fishermen and their family members are likely to find employment have been constricting, and jobs in unskilled sectors of the economy are increasingly staffed by temporary, casual, and immigrant workers who keep wages at minimum levels. In addition, developments in the industrial sector that fishermen have supplied for generations—food and kindred products—threaten to confine those at all levels of food procuring and producing to low levels in company hierarchies. Recent economic developments along these lines include the expansion of Tyson, ConAgra, RJR Nabisco, Phillip Morris, and other food and tobacco companies into fish processing, building on the vertical integration/ contract production models of poultry and, more recently, hog processing (Griffith 1993; Stull, Broadway, and Griffith 1995).

Under these systems, direct producers become little more than caretakers of ponds, herds, flocks, or fields, hired or contracted for specific tasks, and have little stake themselves in the fish, plants and animals they tend. Similar contract fishing arrangements would likely emerge under the large food companies, with more and more vessels staffed by hired captains and crew with less long-term, enduring interest in the health of the resource than independent, owner-operator fishermen who hope to leave the resource and their fishing operations to their children. Fishermen we interviewed for this study, particularly those fishing from small- to medium-sized vessels (*i.e.* vessel measuring between 30' and 75'), fear that Individual Transferable Quotas (ITQs) will speed this process by reducing the quotas available to many fishermen to levels below which they cannot survive, forcing them to sell their quotas to larger corporate interests.

Also, fishermen typically see independence as a key defining feature of their identity; thus they submit with extreme difficulty to the close supervision associated with many jobs and with contract production or contract fishing, where a regimen is established around production quotas or input conversion ratios. They are used to "share" rather than "wage payment" systems, which they view as incentive systems that join labour (crew) and management (captains/ vessel owners) in common desires to maintain high productivity per unit of time and investment of capital. Similarly, fishermen's work schedules—erratic and dictated by weather and the habits of fish, affecting the schedules of other members of their households—do not translate into time-clock regimens of factories, offices, and other jobs.

Wives and children of fishermen interviewed during this study described how they had accommodated their own schedules to absent husbands and fathers and expressed some trepidation over the prospect of the fishermen staying at home for long periods of time. When fishermen are forced into the labour market, their status as small businessmen predisposes them to finding informal, casual jobs when they need to, rather than investing time in career-oriented training, or to operating other independently owned and operated businesses, always looking to return to fishing on a part-time or full-time basis.

These considerations become important as we consider the notion of the dependence of fishermen, their families, and the wider communities in which they live on the MGF. With the exception of New Bedford, it is difficult to argue that groundfishing occupies the economic heart of the any of the

communities profiled in this study, or that each community could not weather or absorb its demise with alternative economic development initiatives. Nevertheless, placing the demise of groundfishing in the broader context of material and symbolic linkages with one of our nation's most important natural resources—historically and today—allows us to define dependence at once more loosely and more comprehensively. The loss of stores of human, social, and cultural capital that currently cement those directly involved in groundfishing with those less and less directly involved—from ice suppliers to insurance executives—will constitute a reduction in social and economic diversity that is no less a threat to the well-being of these communities than the loss of biological diversity is to the marine ecosystem. We elaborate on these issues further in the sections that follow. First, we present a brief overview of the Magnuson Act and the regional council system as they are related to the study.

B. The Magnuson Act and the Management Council

The Magnuson Fisheries and Conservation Act was signed into law to protect the marine resources and fishing communities of the United States. It established the 200-mile Exclusive Economic Zone (EEZ) for territorial U.S. waters and a regional management council system to regulate fisheries in the federal zone. The initial concerns of the act were to eliminate foreign competition and maximise productivity of the American fishing industry. As fisheries have become stressed, there has been a shift towards conservation of resources. Along with the act came the creation of a bureaucracy through the council system to manage the EEZ and fishery dependent communities linked to the resource. The fishing community-fishery dynamic was not considered a priority for managers in the early years of Magnuson, and until recently little attention was paid to the social impacts of regulations.

The Magnuson Act established eight regional fisheries management councils. The New England Fisheries Management Council (NEFMC) has jurisdiction over federal waters (from 3 to 200 miles) in New England. The NEFMC develops management plans and the National Marine Fisheries Service writes the regulations to implement the plans. Both agencies are administered by the National Oceanic and Space Administration (NOAA) under the Department of Commerce.

The NEFMC consists of 15 members, who are appointed to indefinite terms and are chosen to represent stakeholders in the fisheries, including various regions, scientific and conservation interests, and gear and vessel types. Committees develop management plans and address critical issues for fisheries under the jurisdiction of the council. For example, there are committees on scallops, gear conflict, herring, aquaculture, and lobsters.

Each committee has a Plan Development Team (PDT) which liaisons with NMFS biologists, economists and others at Woods Hole to develop the suggestions of committee members into plans which are reported to the full council. Agendas for the development of plans are highly varied depending on what are deemed critical issues, as well as the interests and priorities of particular council members. Once the Council has completed development of a management plan, it is submitted to the National Marine Fisheries Service/NOAA for review. Important criteria which go into the review process include statistical analysis of the population dynamics of utilised fish stocks and estimated catch effort on stocks. Historically, little social and economic data have been factored into regulation development, even though their consideration is mandated by the Magnuson Act.

If NMFS deems a management plan acceptable based on the best available biological, economic, and social information, regulations will be written by NMFS staff to implement the plan. Proposed regulatory actions are published in the *Federal Register*, followed by a period of public commentary. It is historically rare for public commentary to significantly alter the final form of any proposed regulation, a factor that has promoted widespread cynicism among fishermen about the regulatory process. After the

commentary period, the Secretary of Commerce signs the regulation into law. The Secretary also has the power to veto any proposed regulations. The Magnuson Act prohibits court injunction against fishery regulations developed through the Council system. It is the only law with an injunctive prohibition in the history of American jurisprudence. The stages under the council system through which a management plan is considered and matching regulations developed are detailed in Dyer (1994).

Because the southern range of the MGF extends across the Hudson River bight and the Chesapeake Bay to Cape Hatteras, North Carolina, the Mid-Atlantic Fishery Management Council also has an interest in the development of groundfish regulations, particularly flounders and other flatfishes, but relies extensively on the New England Council for recommendations. Communication between the two councils takes place primarily through the MAFMC's New England Liaison person, currently residing in Wakefield, Rhode Island. Twelve private citizen appointees make up the MAFMC's voting members, who come from New York (2), New Jersey (3), Delaware (2), Maryland (2), Virginia (2), and Pennsylvania (1). In addition, six public official members and their designees, representing state marine and fishery management agencies, vote on matters before the council. Day-to-day operation of the council is accomplished by ten staff persons, including an executive director, executive secretary, administrative officer, senior ecologist, senior fishery management specialist, two fishery management specialists (a biologist and an economist), an economic information systems manager, an administrative secretary, and a secretary/word processor.

The Magnuson Act has gone through reauthorization four times since its inception in 1976. Presently, it is up for reauthorization in Congress. Over time, the initial objective to limit impacts of foreign fishing activities in US waters has shifted towards the conservation of "overfished" stocks within the EEZ, and towards conservation of habitat (embracing an ecosystem approach to management).

A proposed modification in recent reauthorization hearings relevant to this report is found under Title I; Conservation and Management: Section 107 of S.39, and Section 7(8). The modification is to National Fishery Conservation and Management Standards. Part of the proposed modification is to require "minimisation of adverse economic impacts on fishing communities." Under Section 7(8) is a related provision that clearly extends the responsibility of management to consider the sustainability of fishing communities: "Conservation and management measures shall take into account the importance of the harvests of fishery resources to fishery dependent communities" (S.39, sec. 109).

This provision can be seen as a needed safeguard mechanism to ensure the survival of these communities if allocation rights are deemed necessary. Amendment No. 7 clearly has an impact on the allocation of fisheries resources by limitations on days at sea. Community dependence on the fishery, as determined in this report, can be utilised in making decisions on the impacts of Amendment No. 7 and in planning management policy consistent with the community language of the Magnuson Act.

Under the dictates of Magnuson, the ability of managers to consider the community impacts of fishery regulations must be guided by "best available" social and economic data. This report provides such baseline data, assessing fishery dependence and pointing to areas where further research is necessary. This report *cannot* be used to measure the magnitude and direction of social and economic impacts of specific regulations, but rather provides focus on critical issues that can only be comprehensively addressed through a Social Impact Assessment (SIA). An SIA informed by our dependency model and identified critical issues should fulfil the requirements of Magnuson while allowing managers and communities to work co-operatively towards mitigating the harmful impacts of needed fishery regulations.

C. Purpose and Objectives of the Study

Until the autumn of 1995, fishermen in New England and the Mid-Atlantic states believed that the implementation of a moratorium on new entrants to the Multi-Species Groundfish Fishery (MGF) and a reduction of the number of fishing days from 190 to 88 over a five-year period—along with other regulatory changes known collectively as Amendment No. 5—would have devastating social and cultural impacts on fishermen, fishing families, those in fishing-related occupations, and others in fishing communities over a broad geographical range. Late in 1995, however, while grudgingly adjusting to the new regulatory environment, fishermen learned of the new and even more restrictive regulations of Amendment No. 7, regulations designed to conserve stressed groundfishing stocks (especially the signature species of Atlantic Cod, *Gadus morhua*). News of the pending regulations sent a mixture of alarm, malaise, betrayal, and anger through fishing communities from Maine to New Jersey and even as far south as Cape Hatteras. Against the background of this emotional and legal turmoil, we entered several major and minor groundfishing communities of New England and the Mid-Atlantic to accomplish the following objectives:

- Ascertain community-dependence on the MGF and the nature and scope of social impacts of the MGF management measures on fishermen, others working in fishery-related employment, and their communities.
- Provide information on the demographics and numbers of fishermen, fishing craft, and persons involved in fishery-related industries, by community, county and state.
- Identify social science data bases and describe social issues which should be used or considered in any follow-up (Phase 2) to this study of social impacts of fishery management in the Northeastern and Mid-Atlantic areas of the United States.
- Develop a classification system that will aid in predicting the social impacts of changing fishery regulations on fishery-dependent communities.

This report provides detailed information on the major MGF communities of New Bedford/Fairhaven, Gloucester, and Chatham, Massachusetts; Portland, Maine; and Point Judith, Rhode Island. In addition, we provide less detailed information on several smaller ports in Maine, New York, New Jersey, Maryland, Virginia, and North Carolina. These include:

- Stonington and the “Down East” Ports of Maine (*e.g.* Machiasport, Jonesport, Winter Harbour).
- Portsmouth, New Hampshire.
- Provincetown, Massachusetts.
- Newport, Rhode Island.
- Montauk, New York.
- Cape May, New Jersey.
- Ocean City, Maryland.
- Tidewater Region, Virginia (including Hampton Roads and Newport News).

- Wanchese, North Carolina.

Information presented in this report on the secondary ports varies fairly widely based on the importance of groundfishing in the ports and the extent of time we were able to spend in these ports.

Together, the community information provides a basis for classifying communities based on their dependence on the MGF, as suggested by five predictive variables to emerge from the study. This will enable both fishermen and regulators to prepare more effectively for future real and perceptual crises in the MGF and related fisheries.

D. Background and Methodological Considerations

Prior to the current study, with a few exceptions buried in local repositories, information on the social and cultural dimensions of the MGF has been dated, anecdotal and incomplete, giving fishery managers little basis from which to estimate how the impacts of the new regulations vary by community, by sector of the fishery, or by other social and cultural phenomena. Through the systematic collection of data on the social and cultural dimensions of the MGF, in this report we develop a classification system that will enable fishery managers to predict the probable consequences of current and future regulations.

D1. Research tasks

To develop this classification system and achieve the other objectives listed above, working in an environment as socially and culturally diverse as the New England and Mid-Atlantic MGF, we have drawn on a combination of traditional ethnographic work and more systematic data collection techniques. These include the Rapid Appraisal (RA) techniques and Rapid Ethnographic Assessment Procedures (REAP) of cultural mapping, in-depth interviewing, and holding focus groups; we supplement these with limited survey research and the techniques of cognitive anthropology known as pile-sorting tasks and multi-dimensional scaling. A drawback of any RA technique is the difficulty in getting consistency of data across communities, particularly when dealing with communities under stress that vary widely in their ethnicity and history. Establishing rapport takes longer in some communities than others, and can also affect the quality and depth of field data. For example, rapport was quickly established in Gloucester with the co-operation of a local fishing organisation, the Gloucester Fishermen's Wives Association. The co-operation and assistance of this organisation made possible the gathering of fine-grained ethnographic information in Gloucester on critical issues such as breakdown of social networks and economic problems in the fishery. Such information was not as readily accessible in other ports such as New Bedford. Thus, under the limitations of the RA method particular issues highlighted in one community study may not be addressed in another. This is reflected in the variation in section headings for the community studies.

Understanding MGF participants' perceptions is crucial to implementing management plans, being particularly useful in designing educational and outreach programmes or marine advisory efforts to prepare MGF participants for regulations, advise them about alternative economic strategies, and otherwise reduce the deleterious effects of management measures. Because the success of regulations depends, in part, on high degrees of voluntary compliance, understanding the perceptions of individuals involved in the fisheries is necessary to convince these individuals to comply.

D2. Community Selection Procedures

To assure the collection of representative information, our strategy for selecting the study communities combined state and federal licensing data with repeated visits to coastal communities between

Maine and Cape Hatteras. We found the licensing data, for the most part, far less helpful than the community visits, with some ports listed as important in terms of vessel tonnage and numbers of groundfishing permits actually being home to few or no groundfishermen. Nevertheless, we utilised licensing data to guide our initial regional tours, which resulted in narrowing the number of communities in which groundfishing remains an important primary or secondary fishery. Key informants, such as state enforcement personnel, NMFS port agents, and local fishermen and active members of fishing associations, assisted in selecting the MGF communities discussed here.

E. Definition of Community

In a recent collection of case studies of folk management in fisheries around the world, Dyer and McGoodwin (1994) draw upon the concept of the Natural Resource Community (NRC) as a social unit anchored in local history and local understandings of ecological relationships, consisting of “a population of individuals living within a bounded area whose primary cultural existence is based on the utilisation of renewable natural resources” (Dyer, Gill, and Picou 1992, cited in Dyer and McGoodwin 1994: 5). According to them, “...a localised worldview, and locally developed assertions about how to best manage fisheries, still arise among fishing peoples at every level of technological sophistication” (*ibid.*). Although fishermen interact, often quite regularly, with individuals and institutions who have few or no ties to fishing, “where they [fishermen] live and work is still a localised, specific place, and quite often they perceive that they take their catches from a specific, bounded, marine ecosystem, which from their perspective has unique systemic attributes” (*ibid.*).

The fishing segments of the primary and secondary ports identified above can be considered Natural Resource Communities (NRCs) in so far as they include significant populations of individuals who depend directly on a renewable natural resource, but they depart from the definition of NRCs in important ways. None of the fishing NRCs we have selected for study are in any sense “bounded,” set apart from the commerce and institutional apparatus of the cities and towns in which they are located; nor do fishermen in these communities seem to perceive the ecosystems upon which they depend as closed systems. On the contrary, similar to the findings of others (*e.g.* Griffith 1996; Durrenberger 1996; Dyer and McGoodwin 1994), most fishers we interviewed for this study viewed marine ecosystems as dynamic and complex, affected by global weather conditions and shore-based human activities. Fishers and their families are particularly concerned about industrial pollutants and coastal real estate development that results in the destruction of wetlands and other marine habitats. Nevertheless, those individuals who comprise the NRCs we have selected—fishing communities within larger, more complex communities—do conform to the NRC model in the depth of their dependence on a renewable natural resource and in the extent to which they are rooted in local history and local traditions, deriving social and cultural identity from a sense of place whose life rhythms rise and fall with populations of fish, seasonal conditions at sea, and the increasingly complex regulatory environment entangling their traditions.

We can consider the NRC of each port as a regional contributor to whatever commerce is stimulated by fishing in general and groundfishing in particular, and as a means of providing sustainable support to fisher families as they contribute a high-quality food product to the region and nation. While only the fishermen themselves interact with marine resources, they are nevertheless embedded in wider communities and towns, contributing to the food security of those communities and towns and buffering coastal development in a way that contributes to social and economic diversity. In the section that follows, we present some limited information on the numbers of individuals and firms within the target study communities that benefit directly from the fishing lifestyle.

F. Demographic Issues

As noted earlier, we selected our primary and secondary ports based on available licensing data combined with brief site visits, phone calls to individuals in the areas, and conversations with fishermen and others familiar with the MGF. In general, we found that highly specialised groundfishing has become more concentrated in recent years, confined primarily to the three primary ports of New Bedford, Gloucester, and Portland. In addition, we found that groundfishing remains an important part of fishermen's annual rounds in the primary ports of Chatham and Point Judith and among small groups of fishermen in Stonington, Maine, the Tidewater region of Virginia, and Wanchese, North Carolina. In most of the other ports, however, other fisheries—particularly shellfish (lobster, scallops, clams, blue crab, shrimp)—have either become recently or have for some time been more important than groundfish. Maine ports outside Portland, for example, have become more dependent on eels and sea urchins in recent years than groundfish.

Many fishers throughout New England and the Mid-Atlantic States have moved into the burgeoning dogfish fishery, as well as expanding their stakes in the traditional shellfish and squid fisheries. Fishermen and state regulators familiar with or dependent on these alternative fisheries fear that fishermen currently being displaced by groundfishing will move into these fisheries, causing crowding and overfishing problems similar to those that are occurring in groundfishing today.

Early in our research we discovered discrepancies between vessel license data and the numbers of active groundfishermen reported during visits to the ports. For example, the first three to four days of field work in the Down East region of Maine revealed that ports such as Machiasport and Jonesport had one or two gillnetters who still fished for groundfish, yet licensing data indicated that Machiasport had 9 permits and Jonesport had 12. The small populations of these ports, moreover, resulted in high per capita numbers of permits, leading us to believe these ports were highly dependent on groundfishing. Field visits proved this not to be the case. Montauk, with 76 active MGF permits and only 24 working groundfish draggers, represents the largest disparity between permits and working vessels. Many MGF permits are held by captains of recreational day boats, some of whom used to fish commercially but now utilise their permits as an option on trips targeted for popular game fish such as tuna. Table 1, then, compares federal licensing data with some information on the numbers of active groundfishermen per port.

Table 1. Number Of NMFS MGF Permits Vs. Estimated Operational Vessels Capable of Groundfishing

Primary ports	Permits	Working vessels
Gloucester	219	200
New Bedford	129	241
Chatham	114	65
Portland	62	80
Point Judith	78	55
Secondary Ports		
Provincetown	26	17
Montauk	76	24
Newport	16	20
Stonington	10	6
Portsmouth	24	n.d.
Ocean City	4	n.d.
Wanchese	12	7
Hampton Roads/Newport	9	n.d.
Cape May	38	33

Demographic information about the communities and some of the support infrastructure reflect their dependence on fisheries (Table 2). We supplemented this information with brief telephone surveys in the three principal groundfishing ports of New Bedford, Gloucester, and Portland, finding groundfishing to indeed occupy a core part of their fishing industry, accounting for between 44 and 53% of their seafood dealing and processing capacity and significant employment (Table 3).

Table 2. Primary and Secondary Port Infrastructure Related to Commercial Fisheries

City of Primary Ports	Population (1990)	Suppliers/ Equipment	Dealers/ Processors
New Bedford, MA	175 641	35	77
Gloucester, MA	28 716	12	43
Portland, ME	243 135	21	42
Chatham, MA	6 579	15	29
Point Judith, RI	3 721	11	32
City of Secondary Ports			
Down East, ME	500–1 500/town	19	11
Portsmouth, NH	28 227	14	9
Provincetown	3 953	2	3
Newport, RI	5 146	15	9
Montauk, NY	3 001	n.d.	3
Cape May, NJ	4 668	23	13
Ocean City, MD	5 146	15	9
Tidewater, VA	1 396 107	67	27
Wanchese, NC	1 380	16	8
Total	n.a.	263	312

Notes: Information based primarily on telephone directories, maps, and field visits; New Bedford, Portland, and Tidewater population figures based on the SMSAs (Tidewater region includes Hampton Roads, Newport News, and Norfolk metropolitan areas); figures for the Down East region of Maine come primarily from the Ellsworth telephone directory, supplemented by field visits.

Table 3. Indicators of Dependence on Local Groundfish in the Seafood Handling Sectors of Three Primary MGF Ports

Port	Average % of business from local MGF	Average employment per plant	Brokers	Unions
New Bedford	52.27	27	2	2
Gloucester	44	15	5	1
Portland	48.4	25	5	0

Port	Avg. Employment x Nos. of Dealers / Processors	Share of business from local MGF		
New Bedford:	27 x 77	x .5227	=	1 086
Gloucester:	15 x 43	x .44	=	284
Portland:	25 x 42	x .48	=	504
Total			=	1 874

Figures from both of the above tables allow us to derive rough estimates of shoreside employment from handling seafood (icing, shipping, and processing) that derives directly from the local MGF. We accomplish this by multiplying average numbers of employees by number of plants by the percentage of business derived from local groundfish.

These figures, of course, refer only to those who handle the catch, excluding those who participate in other shoreside industries such as ice plants, fuel barges, marine railways, marine suppliers, welders and repair operations, and so forth. We discuss these in the following section.

G. Dependence on the Multispecies Groundfish Fishery: Developing a Community Classification System

G1. Assessing Community Dependence on the Multispecies Groundfish Fishery

Understanding community dependence on the MGF requires identifying critical indicators of dependence, assigning them values based on our qualitative data, and comparing them across the study communities. The sum of the values then gives us a rough index of dependence by community.

Since each community is a product of a *unique* environmental history and political ecology, assigned dependency categories must be understood in the context described in each case study. It is clear from the variability seen across communities that changing regulatory or fishery stock conditions will result in community-specific impacts and adaptive responses. Identifying similarities and differences across communities reveals critical social issues that can constitute the basis of a follow-up (Phase II study) Social Impact Assessment (SIA).

The dependency index presented in Table 4 is based on the combination of specific physical-cultural indicators of dependence and general social-geographic indicators isolated across the range of target communities. The data we include in the index are derived from a combination of qualitative

interviews, fieldwork observation and quantitative analysis from secondary data sources. They are not meant to represent the total range of possible physical-cultural factors, but instead represent key factors we encountered in our studies of the five primary MGF communities.

Table 4 shows the fishery dependency scores for the five primary ports. Factors are scored in two ways: nominally (as either present or absent), and ordinally (ranked from 5-highest, to 1-lowest). For example, if a port has 7 suppliers processors, and this is the largest number of the five, it is given a ranking of 5. Normative rankings of a cultural feature, such as secular symbolism celebrating fishing (*e.g.*, a public plaque on a dock) is given a score of 1 (present) or 0 (absent). Thus, higher scores indicate more dependence.

Table 4. Comparative Fishery Dependency Table for the Five Primary Ports in the MGF

Port	Portland	Gloucester	Chatham	New Bedford	Point Judith
Repair or supply facilities	21 (4)	12 (2)	15 (3)	35 (5)	11 (1)
Fish dealers or processors	42 (3)	43 (4)	29 (1)	77 (5)	32 (2)
Religious art or architecture dedicated to fishing	(0)	(1)	(0)	(1)	(1)
Secular art or architecture dedicated to fishing	(1)	(1)	(1)	(1)	(1)
Number of MGF permits	60 (1)	219 (5)	110 (3)	128 (4)	78 (2)
Number of MGF vessels	80 (2)	322 (5)	84 (3)	241 (4)	55 (1)
Fishing Dependency Index Score	11	17	11	21	7

Based on the Fishery Dependence Index (FDI), New Bedford is the most dependent on the MGF, Gloucester second, followed by Chatham and Portland of equal dependence and Point Judith the least dependent. Thus the large-scale communities are more dependent on the MGF than Portland, Chatham, and Point Judith. Among the smaller ports, Stonington is more dependent on fishing in general than Hampton Roads/Newport News, or Montauk.

Point Judith and Chatham are intermediate in size, but Point Judith is the least dependent because of its flexibility in utilising a wide range of fish stocks and gear types. They differ in aspects of adaptability and geography from New Bedford and Gloucester. For example, the configuration of the Chatham port restricts the size of fishing vessels to the small–medium range. Point Judith can handle larger vessels, but the limited dock space, short history, distance from fishing offshore grounds, depletion of inshore groundfish stocks, and emphasis on diversification make it less a presence in the offshore MGF than either Gloucester or New Bedford.

Despite the number of MGF permits held in Point Judith (78), the concentration of the fleet is on offshore midwater species, and with the short history of the fishery and an approach to fishing that does not depend on extensive kinship or village networks, the fishery is more adaptive than Gloucester or New Bedford. New Bedford has a greater capital investment by scale than Gloucester, and repair and service capacity for vessels. Features of Gloucester that make it more dependent than Portland include: linguistic and work-organisational boundaries to change, high investment in offshore dragging with large crews and parallel large family networks dependent on the fishery.

The Fishery Dependence Index (FDI) does not include details of social and geographic factors in its determination, yet the results are supported by the social and geographic characteristics of each port. Furthermore, it complements and is consistent with the fine-gained ethnographic details and identified critical issues presented in the case studies of each primary port. These variables provide the means to operationalise the concept of dependence by creating an index that includes qualitative and quantitative data about variables that differentiate between ports in terms of: (a) the city's or town's dependence on the fishing industry, and by extension on the MGF; and (b) the NRC's dependence on the MGF to the exclusion of other fisheries or other economic activities.

An index of this nature, however, remains a crude estimate of dependence, partially because of the difference between *fishermen's* dependence on the MGF or *community* dependence on the MGF. Comparing the community studies, we find that while the city of New Bedford is most dependent on their fishery for overall community health, the fishermen of Gloucester are more heavily dependent on the MGF than the fishermen of New Bedford. This is primarily due to New Bedford's Portuguese community and the opportunities it provides for dealing with the crisis in groundfishing by moving back to Portugal. Observations of this nature suggest, and our studies confirm, that neither New Bedford nor Gloucester would weather a prolonged crisis in groundfishing without widespread suffering.

G2. *Assessment of between Ports*

Comparing the information from the principal communities allows us to develop a rough ranking of communities in terms of their dependence on the Multispecies Groundfish Fishery. In combination with the FDI information presented above based on the information in Appendices A through F, it appears that fishermen in New Bedford and Gloucester are more dependent on the MGF than fishermen in Portland, Chatham, and Point Judith; by the same token, Stonington, ME and Wanchese, NC are more dependent on fishing in general, if not the MGF in particular, than the other secondary ports. In both cases, among a segment of the fishing families in these communities, the MGF is important as providing both core and secondary target species within a flexible fishing strategy that, through the course of a year, might combine three to four gears and target three to four species.

Fleets in some of the secondary ports have either become relatively marginalised or have managed to integrate themselves into the tourist and leisure uses of the coast to such a degree that they would be difficult to dislodge at this historical juncture. In Cape May, NJ, for example, the fisherman's wharf extends from a cluster of tourist shops and restaurants to a retail seafood market to a series of processing houses as malodorous and cluttered as the busiest seafood houses of New Bedford; in this case, as in Chatham, the fishing industry is an integral component of what attracts the tourists, who dine on fresh fish only yards from where the vessels off-load and ice-down their catches.

While some differences in dependence are due to one port's economic complexity relative to another's, with some ports experiencing more and more diverse job growth than others, we would have trouble arguing that there is an inverse relationship between economic complexity and dependence on the MGF. Portland and New Bedford are roughly equally economically complex, both struggling with constricting manufacturing sectors and attempting to enter the 21st century via trends in globalisation, international commerce, and developing professional services, yet Portland's economy as a whole is less dependent on its commercial fishing sector than New Bedford's. By the same token, the character of job growth in Gloucester, Chatham, and Point Judith are similar—all three cities attempting to enhance their images as tourist destinations and artists' colonies, with even some of the Gloucester city fathers believing that some kind of boutique fishery will emerge from the current crisis—yet the fishermen in Gloucester are having a far more difficult time adapting to a new political economic climate than those in either Chatham or Point Judith.

The same applies to variations in a port's isolation or distance from main transportation thoroughfares such as interstate highways. Chatham is no less isolated than Gloucester, nor Stonington any more isolated than Machiasport or Jonesport, yet variations exist in terms of these communities' relative dependence on groundfishing. Ocean City, MD and Cape May, NJ are roughly equidistant from the sprawling metropolitan area that includes Philadelphia, Wilmington, and Camden, but the fishing fleet in Ocean City has been relegated to a small harbour on the south edge of town while the Cape May fleet, as just described, ties up in a bustling tourist centre. The Ocean City fleet, further, may be destined for further reductions, judging by the land for sale around the commercial fishers' harbour—land which suggests that zoning has begun to expand the tourist shops and recreational marinas into the space currently occupied by the commercial fleet. By contrast, the Cape May fleet seems well ensconced.

G3. Assessment of Variations within Ports

Observations addressing the variations between MGF ports are further complicated—if also partially explained—by the variation that exists within the ports, between different fleets and groups of fishermen. Within each of these ports, some fishermen are more dependent on the MGF than others; these distinctions seem loosely related to fishers' degree of specialisation, their histories of moving between fishing and non-fishing fields, vessel size and ownership status (how heavily the vessel is mortgaged), and their histories of participation in alternative fisheries.

In addition to these social and economic sources of dependence, cultural factors also affect dependence on the MGF. Although ethnic factors differentiate ground-fishermen of New England and the Mid-Atlantic states, these distinctions become important only in so far as they have resulted in ethnic enclaves and ethnically-grounded economics. For example, the New Bedford fleet is composed of large numbers of Portuguese fishermen and Norwegian fishermen, yet the Portuguese have developed a thriving Portuguese ethnic enclave while the Norwegian enclave is less isolating. Thus, for the Portuguese fleet of New Bedford, ethnic status becomes an important factor in determining the character of one's dependence on and behaviour in the fishery, but among the Norwegians ethnic status is less important. This is because the enclave nature of the Portuguese community in New Bedford has made it possible for Portuguese fishermen to remain relatively detached—culturally, linguistically, and occupationally—from other economic sectors of New Bedford. On the one hand, this makes it particularly difficult for them to move into other economic sectors as crises develop in fisheries. On the other, they are more willing to keep other Portuguese crew members employed even under conditions of deteriorating incomes and many of them have kept the option open of returning to Portugal by continuing to maintain strong social ties with their home communities in Portugal.

The Portuguese of New Bedford (including the islanders such as Cape Verdeans) live in what is considered a transnational community, with social and cultural roots and branches in two and sometimes more than two nations (Basch, Glick-Schiller, and Szanton-Blanc 1995). Gloucester Italian/Sicilian fishermen occupy something of a middle ground between Norwegians and Portuguese in terms of how much ethnic factors influence their responses to fishery crises. They do not seem to have achieved the same level of transnationalism as the Portuguese fishermen of New Bedford, but they do tend to keep other Italian crewmembers employed as incomes decline (Doeringer, Moss, and Terkla 1986).

The communities have also produced physical expressions of their dependence of fishing. For example, linking a religious structure to fishing, such as the Church of the Fishermen in Gloucester, with its murals and sculpture dedicated to fishing, indicates how important fishing has been and is still to the well-being of church parishioners. Fishing is at the very core of their daily existence, and special prayers for fishing and fishers are a regular part of religious services. Social, cultural, and economic dependence are combined in such symbolism. Because the church in these communities acts as a social extension of

the hope and aspirations of its members, religious recognition of fishing is certainly a profound indicator of historical fishery dependence in a community.

Secular cultural indicators of fishery dependence include public dedications to fishers and the fishing industry, such as museums dedicated to preserving the artefacts and history of the industry. New Bedford's whaling museum is one such example, celebrating fishing and mariners of all kinds. Chatham publicly displays its support of fishing with a prominent plaque on the town dock. In Gloucester, perhaps the most famous American fishing icon of all is the bronze statue of the Gloucester fisherman. In a media climate where the fishery has been portrayed as dead or dying, it is significant that Gloucester has recently undertaken to erect a statue of the fisherman's wife, scheduled to be completed and in place several years from now.

These observations lead us to consider what features of New Bedford's and Gloucester's MGF make fishermen here more dependent than Portland, as well as to reconsider our notions of community and of dependence. Clearly, those dependent on the MGF do not include entire cities and towns, but sub-populations of larger metropolitan areas and rural towns that comprise communities in the sense of an occupational community or a natural resource community. We suggest that dependence of groundfishing does not vary by city or by town as much as by classes of fishermen within the industry who concentrate in specific ports.

While some of the secondary, rural, isolated ports in Maine and other states can be considered highly dependent on fishing, it is difficult to place any of the principal groundfishing ports (besides, possibly, New Bedford) into this category. Portland is a bustling centre of commerce, and even New Bedford is exploring alternative economic opportunities in the wake of fishing and manufacturing declines. Gloucester is nurturing a growing tourist trade and fostering its image as an artists' colony. Chatham and Point Judith are neither isolated from commercial activity nor suffering from a dearth of alternative economic opportunities. Even within many of these communities—particularly those in Downeast Maine—one would be hard pressed to argue that the MGF is either as important to communities like Machiasport or Jonesport as it once was or as important as the more densely populated fisheries such as lobster, urchin, eel, scallop, and shrimp.

Despite these observations, several features of the MGF recommend against encouraging its decline, through the imposition of ever more restrictive regulations, on the basis of the rather cold argument that relatively few families will be negatively impacted. The industry is deeply intertwined with the social and cultural resources of the five principal MGF communities and constitutes an important link to one of the nation's most promising renewable natural resources. As more and more of the ties to credit institutions and arrangements, markets, marine suppliers, ice manufacturers, and others directly or indirectly involved in the industry weaken, due as much to negative publicity and perceptions as to the realities facing the fishery, these components of the social infrastructure rely more and more on alternative sources of fish, usually from imports, and alternative patrons for their goods and services. The following classification of communities in terms of dependence thus considers the current difficulties facing the MGF in terms of the potential for these kinds of relationships deteriorating, leaving the Northeast without a basis from which to marshal an efficient fishery.

We have isolated the following five variables as those that reflect and best predict dependence on the MGF. It will become obvious that the five variables overlap somewhat; thus, they must be considered together. These are:

- *Relative isolation or integration of fishermen into alternative economic sectors, including political participation.* To what extent have the fleets involved in the MGF enclave

themselves from other parts of the local political economy or other fisheries? How much have the MGF fleets become, similar to an ethnic enclave, closed communities?

- *Vessel types within the port's fishery.* Is there a predominance of large vessels or small vessels or a mix of small, medium, and large?
- *Degree of specialisation.* To what extent do fishers move among different fisheries? Clearly, those fishermen who would have difficulty moving into alternative fisheries or modifying their vessels with alternative gears are more dependent on the MGF than those who have histories of moving among several fisheries in an opportunistic fashion.
- *Percentage of population involved in fishery or fishery-related industries.* Those communities where between five and ten% of the population are directly employed in MGF fishing or fishing-related industries are more dependent on the MGF than those where fewer than five% are so employed.
- *Competition and conflict within the port, between different components of the MGF.* Extensive competition and conflict between fishermen within the same port—as well as between different actors in the MGF, such as boat owners and captains—seem to be associated with intensive fishing effort and consequent high levels of dependence on the MGF. In this case, dependence may have a strong perceptual dimension, with fishers perceiving the resources they are harvesting to be scarce and that one fleet's gain is another fleet's loss.

Within each box under the ports we have included a plus sign or a minus sign, which indicate more (+) or less (-) dependence on the MGF. The more plus signs a port ends up with, simply, the more dependent that port is on the MGF.

Table 5. Comparisons of the Five Primary MGF Ports by Indicators of Dependence

Indicator	New Bedford	Portland	Gloucester	Point Judith	Chatham
Integration	Isolated +	Integrated -	Isolated +	Integrated -	Integrated -
Vessel Types	Large +	Large to Mixed +	Large +	Medium -	Medium -
Specialisation	High +	Medium +	High +	Low -	Low -
% of pop	5 - 10% +	<5% -	<5% -	<5% -	<5% -
Competition	High +	Medium to High +	High +	Low -	Low -
Total +	5	3	4	0	0

This classification system leads us to rank the ports, from most to least dependent on the MGF, as follows: New Bedford/Fairhaven, Gloucester, Portland, Chatham, Point Judith.

H. Social and Cultural Parameters of the MGF: Issues and Data Bases

This concluding section to the synthesis contains three parts. First, we present the results of the perceptual tasks we asked fishers and others familiar with the industry to perform in each of the ports, revealing how they classify various regulations and rules of government agencies and private business. Second, we present a list of several problems that emerged again and again during our interviews and reflect key ways in which fishers are likely to be affected by regulations, as well as how they view regulations and regulatory agencies in terms of legitimacy. Finally, we discuss the various forms of capital in the fishery and how they are tied to the future of the industry under current conditions and proposed regulations.

H1. Perceptual Issues: Results of the Pile-Sorting Tasks

To get some idea of how fishermen thought about various government regulations and policies of private firms, we asked respondents to perform relatively easy grouping or “pile-sorting” tasks in each of the five primary ports. Thirty-seven fishers and others familiar with the MGF sorted 24 cards bearing the following polices and regulations (symbols used in the computer output are in parentheses accompanying the stimuli):

- | | |
|--|------------------------------------|
| 1. Insurance Policy (IP) | 13. Bank/ Credit Policy (BNK) |
| 2. Limits on Participation in Multiple Fisheries (LMF) | 14. Limiting Days at Sea (DAS) |
| 3. Entry Based on Historical Participation (HP) | 15. Access Issues (AI) |
| 4. Limited Entry (LE) | 16. Mesh Size Restrictions (MSH) |
| 5. Permanent Closures (PC) | 17. Landing Restrictions (LR) |
| 6. Species Restrictions (SR) | 18. Season Closures (SC) |
| 7. Net Bans (NB) | 19. Area Closures/ Crowding (AC) |
| 8. Individual Transferable Quotas (ITQ) | 20. Licensing Moratorium (LM) |
| 9. Call-In System (CI) | 21. Area Closures/ Habitat (NU) |
| 10. Poundage Quotas (PQ) | 22. Limits on Numbers of Gear (LG) |
| 11. Marine Mammal Protection (MM) | 23. Gear Licensing (GL) |
| 12. Tow Time Restrictions (TT) | 24. Licensing By Fishery (LF) |

We selected these items based on early interviews with fishers regarding those laws and rules of private businesses that had influenced their fishing behaviours. We simply handed the respondents cards with the above regulations printed on them and asked them to sort them into piles based on how they believed them to be similar. We told them they could have as many or as few piles as they wanted; what mattered was their idea about how they fit, or did not fit, together. After sorting the items, we asked them to state why they had placed them in the piles that they had.

Tasks of these type generate data that are amenable to hierarchical clustering and multidimensional scaling techniques of analysis. Both of these methods essentially count the number of times each of the above 24 items occurs with each other item in the groups that fishermen produced, but each method presents the output from these counts somewhat differently. An additional benefit that derives from this method is that, while sorting the cards, respondents often talk extensively about how they feel about certain regulations; often it is these comments that are more useful than the clustering or scaling output.

H2. Clustering Analysis

Clustering analysis groups the items, showing hierarchical relationships among them, while scaling plots them in two-dimensional space so that those closer to one another on the MDS “map” are presumably closer to one another in the minds of fishermen. The clustering analysis produced the groups and sub-groups as indicated in Figure 2.

Figure 2. Results of Hierarchical Clustering Analysis

Group 1:

Banking & Credit Policy
Insurance Company Policy
Access Issues (Dock Space)

Group 3:

Individual Transferable Quotas
Poundage Quotas

Group 5:

Call-in System
Days-At-Sea Restrictions
Mesh Size Restrictions
Limits on Numbers of Gear

Group 2:

Marine Mammal Protection Regulations
Area Closures due to Crowding
Area Closures due to Habitat or Nursery
Season Closures
Permanent Closures

Group 4:

Tow Time Restrictions
Species Restrictions
Net Bans
Landing Restrictions

Group 6, sub-group 1:

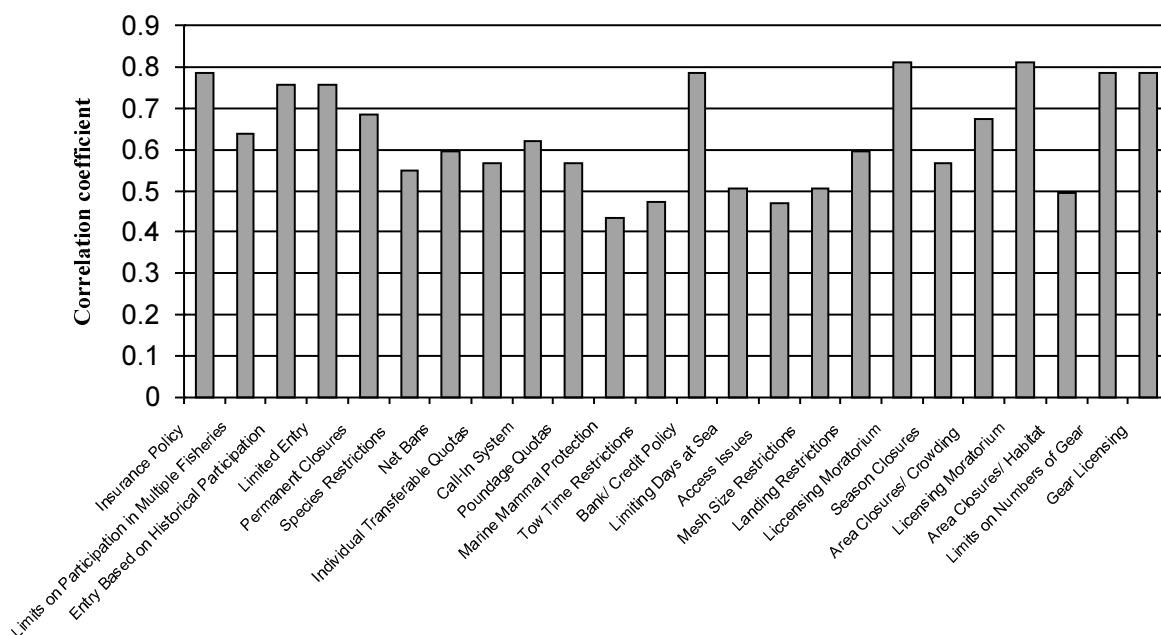
Entry Based on Historical Participation
Limited Entry
Licensing Moratorium

Group 6, sub-group 2:

Limits on Multiple Fishery Participation
Gear Licensing
Licensing by Fishery

These groupings are not too surprising. The output above shows that the distinctions between the groups become less and less distinct as we get into the higher group numbers. That is, the items in groups 4, 5, and 6 are less distinct from one another than the items in groups 1, 2, and 3. Groups 4, 5, and 6 are correlated at level 0.4723, while groups 1 and 2 are correlated at the 0.1204 level and groups 2, 3, 4, 5, and 6 at the 0.3022 level. These numbers indicate that fishermen are making progressively less fine distinctions between groups as we move from left to right across Figure 3.

Figure 3. Hierarchical Levels Among Groups of Regulations



Group 1 is primarily private firms’ or private individuals’ policies and these were the most distinct from the other regulations we presented to fishers. We will see in the MDS output below, that these three regulations were far distant from the others, and that presumably they differ significantly in fishers’ minds because they are formulated in the private sector. About these, one fisherman said, “These have nothing to do with NMFS. They are typical business issues and easily resolved.”

Most of the respondents associated the stimuli in Group 2, of course, with “conservation” methods, often considered necessary to preserve spawning or nursery areas or to protect specific marine species. This group generated mixed responses, in that many fishermen commented that marine mammals were over protected yet agreed with closures designed to protect habitats. “These are regulations that affect my operation,” said one, “but I have no real opposition to them.” “Closures are a must,” said another. Indeed, finer distinctions within the group shows that marine mammal protection was correlated with the others at a lower level (0.4324) than any of the others, suggesting that some fishers put it into this group reluctantly and others placed it elsewhere. Fishermen expressed the most positive feelings about regulations in this group, however, modifying them with adjectives like “needed,” “good,” or “helpful.”

Group 3, quite obviously, is quota systems, and considered problematic by most fishermen. Fishermen who fish from smaller-sized vessels, in particular, worry that ITQs will result in corporate inroads into fishing and speed the process of “proletarianisation” in the fishery, converting owner-operators into hired captains or pushing them out of the fishery altogether. “These give the resource away to private ownership,” said one. A few respondents included these systems in piles with the restrictions in groups 4, 5, and 6 and simply stated that these kinds of regulations restricted a fisherman’s flexibility, were bureaucratic attempts to regulate fisheries, and simply, “won’t work.”

Comments about the items in group 4 ranged from those who considered these sensible to those who considered them foolish. One fisherman said, “These regulations make me see red!” (*i.e.*, make him

angry), but another characterised these as “Good if you can enforce them,” perhaps referring to the difficulties one state has controlling landings in a port in another state (for example, Maine fishermen landing lobster in Boston caught in dragger nets). In general, however, they were seen as ways to protect stocks and limit fishing effort that were difficult to enforce.

Items in groups 5 and 6, all associated with confining fishermen to specific fisheries, “boxing” them in, and limiting their flexibility, were the most despised by those we interviewed. Those in group 5 were associated with Amendments 5 and 7, of course, and those in group 6 were seen primarily as attempts to limit fishing through licensing requirements. The two groups are not that distinct, related to one another at the 0.4723 level, and they all elicited a range of extremely negative and often heated comments, such as:

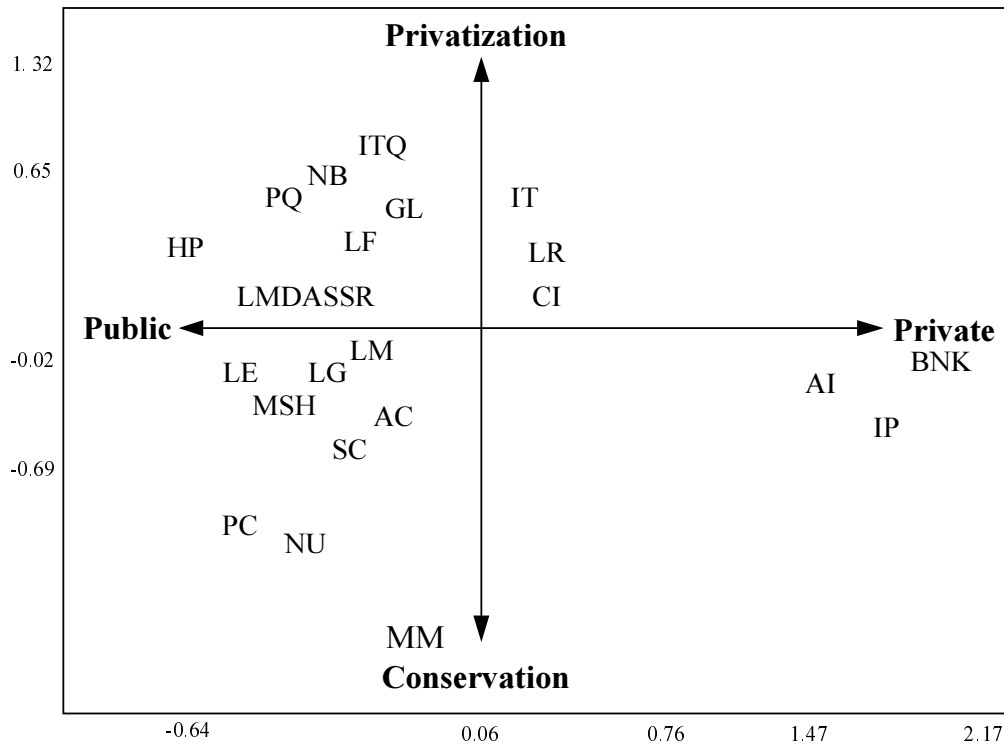
- “These will put me out of business.”
- “I disagree with all these issues. They are not legitimate. Some are ludicrous. It’s not right to tell people don’t try as hard as you can. Conservation is not limiting gear and species.”
- “These are management policies that are unjust, unenforceable, and unworkable.”
- “These are problem things that will do nothing for conservation—a waste of time.”

Overall, the clusters and their associated comments suggest that fishermen care primarily about conserving the resource, but do not believe that many of the regulations designed to conserve resources will actually accomplish this.

H3. Multidimensional Scaling

The MDS output (Figure 4) complements the clustering analysis by, first, showing that fishers regard the rules and policies of private firms (IP, BNK, AI) as quite distinct from government regulations. Thus, one dimension along which fishers organise their thinking about regulations is the Public-Private dimension, indicated by the vertical [horizontal?] arrow on Figure 4. The horizontal [vertical?] arrow is somewhat more difficult to interpret. It indicates a transition from those regulations fishers considered actual conservation measures, protecting the resource, even if sometimes they saw them as overly protective (MM, PC, NU, SC, AC; bottom of the chart) to those highly politicised regulations that are seen as mechanisms, disguised as conservation measures, that will further privatise or turn the fisheries over to corporate entities.

Figure 4. Multidimensional Scaling of Regulations as Perceived by New England Groundfishermen



H4. Concrete Problems and Issues Perceived by Groundfishermen and their Families

Several issues surfaced again and again in our interviews with fishermen and others in the MGF communities. These indicate dependence, provide hints about probable responses to the crisis by groundfishermen, and isolate other concerns raised during the course of field work. They are particularly important in considering the potential impacts of new and future regulations. These include:

- *Past adaptations to crises, whether ecological, economic, political, etc.* Most fishers agree that they will respond to the current crises in ways similar to their responses of the past. Through an historical analysis, covering recent history, we could enumerate some of the common methods fishers respond to crises. Primary among those we encountered in the field are: first, moving to other fishing grounds or territories (e.g., migration), which is a particularly common approach among those, such as the Portuguese, who are already involved in a transnational community; and, second, experimenting with alternative fisheries. In addition, fishermen and fishermen’s wives have responded to past and current crises by organising for more effective political participation, have challenged laws either formally (through law suits and injunctions) or informally (by ignoring or discovering ways to circumvent regulations), and have moved between fishing and non-fishing employment, generally in construction and manufacturing. From those whom we interviewed who have moved between shore-based occupations and fishing, we elicited occupations primarily attached to the marine environment (e.g. shipping, working on research vessels, longshoremen, working for marine repair services).

- *Specific participation in other fisheries.* Many of the fishermen we interviewed had the sense that the regulations were confining them or “boxing them in” to one fishery at the expense of allowing them to take advantage of developments in other fisheries. This reduces the flexibility that is a hallmark particularly of smaller and medium-sized vessels, as well as contradicts current government and private efforts to promote under-utilised or newly developed fisheries. At the same time, the wholesale promotion of new fisheries is often considered suspiciously by fishermen, such as promoting dogfishing without having a sound knowledge base about the fishery’s potential to reproduce itself.
- *Fishers’ perceptions of the current crisis and of regulations in general.* From fishers’ points of view, there exists a severe crisis of legitimacy within those governing bodies and agencies that currently regulate the fisheries. Nearly universally, fishermen complain about a lack of communication between fishery biologists and fishermen, about the inaccuracies of fishery biology, about the concentration on economic efficiency of the fisheries without considering social impacts of regulations, and about the failure of institutional responses to crises. Enforcement, fishers believe, will become increasingly difficult without active involvement of fishermen in the decision-making process. One of the primary complaints centred on logbooks. Fishermen complained that the new logbooks were designed for statistical reporting more than in terms of the realities of life aboard fishing vessels, yet they fear that, despite this, the logbooks are not being utilised. Fisheries biology is thus falling further and further behind as the data accumulate.
- *Failures of institutional/governmental responses to crisis.* Most fishermen agree that the vessel buy-back and the retraining programmes were poorly designed, poorly administered, and are only helping those who had already been marginalised within the fishing community because of poor fishing performance. The buy-back programme has, according to those we interviewed, benefited individuals who have already left fishing. Active fishers, especially those with strong social attachments to their crews, have not sold out because they would be abandoning their employees. The retraining programmes are not based on any past appreciation of the actual economic behaviours or skills of fishermen, but too focused on aquaculture and other programmes not necessarily relevant to fishers’ skills. Portuguese and other fishermen who have difficulty with the English language, in particular, found the retraining programmes completely inadequate.
- *Safety issues.* Many of the new regulations encourage unsafe behaviour in the fisheries. In particular, regulations, and economic developments resulting from regulations both promote reductions in crew sizes (because shares are dwindling, for example) and encourage fishers to remain at sea during rough weather (because of days-at-sea limitations). Crew reductions, of course, result in more work aboard vessels per crewmember and the neglect of certain activities associated with safety. Increased competition and conflicts between vessels and between fishers from other ports, due to the perceptions that fishers are having to divide up an ever shrinking pie, have decreased the extent to which fishers help one another out of trouble on the open seas. While nearly all fishermen reported that they would assist vessels truly in danger, many said that those in marginally dangerous circumstances are more likely to be left alone.
- *Origins of the current crisis.* Nearly everyone agrees that the current crisis originated with the overcapitalisation of the fleet during the 1970s and 1980s, in part driven by low-cost loans underwritten by the US government. Access was too open during that period, as well, with licensing restrictions far too loose to exclude anyone. Many see another crisis developing, as

government efforts to promote under-utilised species (such as dogfish) proceed without adequate biological knowledge about these species.

- *Uneven regulation of the fisheries.* Related to the point just mentioned, fishers tend to agree that the government is over-regulating some species (*e.g.*, Haddock) while under-regulating others (*e.g.*, monkfish and dogfish). They are not responsive to either the concerns or the observations of fishermen regarding stock assessments, and cannot be predicted to respond to information about stocks in what fishermen consider a rational manner. For example, the haddock stocks are seen to be so large that many pounds are being wasted because they cannot legally land them, yet fishers believed that reporting this waste would lead NMFS officials to close the fishery. These beliefs, widespread in the industry, lead fishermen to conceal their information about stocks.
- *Competition within and between ports has reached epidemic proportions.* There is a tendency for smaller-vessel fishers to blame large-vessels fishers, for different gear types to blame one another, and for fishermen from one port to blame fishermen from others for overfishing and damage to substrates or fish populations.
- *Failure of management to recognise the impacts of fisheries regulations on families and households.* Fishers are embedded in households that represent a shoreside extension of fishing activity. Wives and families of fishers are often intimately involved in management of fishing operations, including tracking of finances, attending public hearings on new regulations, and providing political and public input on fishery issues. Management policies that do not recognise this can negatively impact the social, psychological, and economic well being of the fisher household. Costs to fisher households can range from wives being forced to work multiple jobs outside the home to foreclosures on homes whose mortgages are tied to fishing vessel mortgages.
- *Lack of support for domestic fishery products by the Government.* Recent downturns in ex-vessel prices of groundfish have been brought about by unchecked influxes of foreign fishery product. Given the economic difficulties already faced by fishers, allowing foreign imports to drive domestic fishers out of business is perceived as an unfair government business practice.
- *Credit crisis.* Perhaps the most devastating problem to develop in recent years is the drying up of institutional sources of credit and financial capital due in large part to the negative publicity surrounding the fisheries. Similar to farmers, who need credit to help them through bad crop years, fishermen depend on creditors to cover trip expenses and weather poor fishing conditions that may last whole seasons or years. Yet suppliers financial institutions alike have begun tightening the credit they extend toward fishermen. More devastating to owner-operator, family fishermen, home mortgages and vessels mortgages are often tied together in loan agreements; as banks target vessels for foreclosure, they target fishers' homes as well. The deterioration of institutional or conventional forms of capital, then, has increased the importance of alternative forms of capital, which we discuss below.

H5. Alternative Forms of Capital and the Loss of Natural Resource Infrastructures

We know, of course, that several suppliers of goods and services depend directly or indirectly on the MGF, yet the extinction of the MGF would not necessarily entail anything more than minor downturns in their own scale of operations. Fuel providers and boat builders and maintenance personnel could seek alternative customers in the shipping, recreational, ferrying, and other fleets. Municipal harbour masters

would likely have little trouble renting precious dock space to pleasure and merchant crafts. Seafood markets and processing firms could pioneer relationships with imported and aquaculture fish or move to specialise in those local species that remain abundant and available. Perhaps only ice manufacturers and highly specialised marketing and service providers would suffer severely from a disappearing MGF.

Nevertheless, a complete collapse of the MGF would have far more devastating consequences than the simple listing of firms and numbers of fishermen who would be mildly or severely dislocated. Most of the deepest problems derive from the loss to the local economy of local investment: specifically, investment that is rooted in local history and tradition and that remains tied to the community through economic downturns for reasons other than mere profit. A dynamic MGF provides a sector capable of promoting social and economic diversity in the communities we have been studying.

The importance of forms of capital that complement and at the same time supplement investment or financial capital of capitalist firms derives, in fact, from their abilities to recruit new members into the occupational hierarchies of businesses like the MGF and to provide an increasingly wider set of growth and meaningful economic opportunities for those who choose to enter the MGF. These alternative forms of capital include human, cultural, and social capital, with social capital particularly central to our understanding of the MGF.

The concept of social capital was recently explicitly articulated by the late James Coleman (1988, 1990), yet versions have appeared in sociological and anthropological theory in several forms. Coleman himself gives the economist Loury credit for coining the concept as an attempt to compensate for the bias toward individualism in economics (1990: 301). Drawing on several works in sociology and anthropology that demonstrate ways in which social ties influence and organise economic behaviour, and using several illustrations, Coleman arrives at a definition of social capital that returns to his central themes of behaviour as the product of self-interest and control (1990: 302):

“Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of a social structure, and they facilitate certain actions of individuals who are within the structure. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that would not be attainable in its absence. Like physical capital and human capital, social capital is not completely fungible, but is fungible with respect to certain activities. A given form of social capital that is valuable in facilitating certain actions may be useless or even harmful for others. Unlike other forms of capital, social capital inheres the structure of relations between persona and among persons. It is lodged neither in individuals nor in physical implements of production.”

In Coleman’s sense, social capital enables individuals with reduced or no access to investment capital to accumulate the symbolic and material means to participate successfully in an economic activity such as groundfishing. Social capital depends, however, on the social field in which people give and receive jobs, information, low-interest or no-interest loans, and so forth. It is that social field which gives social capital life, transcending the individual without leaving her or him out of the equation, “both accounting for different outcomes at the level of individual actors and making the micro-to-macro transition without elaborating the social structural details through which this occurs” (1990: 305).

The social relations that engender social capital also assure its circulation through the group and its continual replenishment and reproduction. Drawing on social capital carries with it the obligation to replenish the fund, depending on trust, expectation, normative values, cultural rules, etc., and some means — authority, shame, gossip, force — to enforce the obligation.

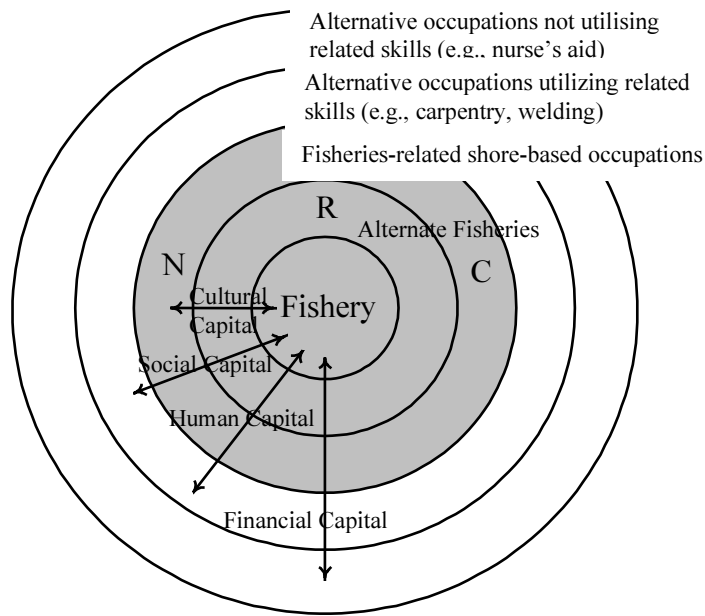
Two other forms of capital — human and cultural — are key to understanding the depth of the current crisis in the MGF; these forms of capital similar to social capital in that they depend on social ties that have meaning for the individuals who benefit from them. Human capital — simply, the skills and education levels one achieves through schooling, apprenticeship, experience, and other formal and informal training — is more well-known among economists than either social or cultural capital, and more recognised by the general public (including potential employers) as something, if not entirely tangible, certainly useful.

Cultural capital is both less well known and less widely recognised by the general public, yet most potential employers consider one's cultural capital in selecting employees. Cultural capital consists of those subtle and overt characteristics we learn as parts of meaningful cultural groups, including our use of language and slang, our notions of personal space, how we dress and carry ourselves, and the myriad parts of our personalities that make us more or less comfortable and predictable to be around. The groups in which people acquire cultural capital include, for example, families, neighbourhoods, and special cultural centres such as bars or exclusive college campuses, churches or other voluntary associations.

The adjustments and difficulties we are currently witnessing in the MGF, particularly the difficulty it seems to be experiencing as it reproduces itself, are steps toward eroding the social, cultural, and human capital upon which an effective fishery depends. Unfortunately, this occurs at a time when the fishery can least afford it: that is, when conventional credit systems are deteriorating as well. Doeringer, Moss, and Terkla (1989: 79-80), in their discussion of the share systems that characterise payments to labour and capital in the groundfishing industry, recognise the importance of these alternative forms of capital without explicitly defining them as we have. Instead, here and elsewhere in their text, they differentiate between “kinship and capitalist vessels,” and describe how “kinship vessels are better positions for investment than capitalist vessels.” During boom periods in the fisheries, the share system results in some of the income that would return to capital — to the vessel — under a strict wage payment system instead returning to labour — the crew — whether the vessel is family owned and operated or part of a capitalist fleet. On kinship vessels, this capital is then held in reserve by crew and can be accessed again during years of reduced catches.

This is less liable to occur under current conditions. Not only is capital not likely to return to the vessel as it becomes more difficult to enforce the mobilisation and use of alternative forms of capital within the fishery, but these alternative forms of capital are crucial in accessing other sectors that provide buffers to fishermen and their families during downturns in fishing stocks, markets, or restrictions that force them to seek other opportunities to cover their expenses in the short term. Figure 5 provides a visual portrayal of how alternative forms of capital forge relationships between the MGF and other economic alternatives.

Figure 5. Model of the Relationship between Alternate Forms of Capital and Occupational Roles in the Natural Resource Communities of the Multispecies Groundfish Fisheries



NRC = Natural Resource Community (Shaded Area)

Figure 5 indicates the extent to which these alternative forms of capital are important in linking the groundfishing industry and groundfishers into wider economic sectors. It suggests that as long as a healthy MGF exists—one that continues to promote the generation, mobilisation, and use of alternative forms of capital—individuals operating within the industry will be able to weather economic and ecological downturns and reproduce the fishery by means of their access to other sectors by drawing on various forms of capital. It is in this context we consider the future of the MGF, particularly its ability to reproduce itself, and the future ability of the United States to continue contributing to the GNP through its exploitation of the oceans.

III. Primary Ports: Community Studies

A. Portland, Maine

A1. *Overview of Maine Groundfishing*

Natives of Maine draw much of their identity and trace their ancestry to traditions based on coastal and marine resources and other interactions with the natural environment (Duncan 1995). Maine fisheries are best known for lobstering, which has emerged as a highly specialised and lucrative fishery but which, currently, is grappling with territoriality and crowding issues that may become more pronounced as continued restrictions on groundfishing force ground fishermen into alternative summer fisheries (Acheson 1987; *Ellsworth News* 1996). Although they are quite distinct in terms of gears and parts of annual rounds, groundfishing and lobstering overlap seasonally, both being primarily summer fisheries yet both containing the possibility to employ fishermen through the year. Winter lobstering may lead to conflicts with scallop draggers and winter groundfishing is more haphazard than summer groundfishing due to weather conditions, but both continue through the winter months on a limited basis.

Regionally, the groundfishing fleet in Maine is far more concentrated than the lobstering fleet. Virtually every Maine port—from Kittery to those distant, rural, and isolated ports north and east of Machiasport—is home to several, often hundreds, of lobster fishing vessels and lobstermen, with even small ports having thirty to forty of the distinctive 35' to 50' crafts that sell to three or four lobster co-operatives or dealers. Thousands of wooden and wire traps, either square or aircraft-hangar shaped, crowd yards and docks throughout every sheltered port along Maine's coast. A lobster adorns the Maine license plate and lobster pounds, restaurants, and other benchmarks of the industry's place as a centrepiece of the coastal economy—the single most important mainstay of thousands of coastal Maine families—clutter the roadways in and around any coastal access point.

The same cannot be said of groundfishing. Since 1987, when the Portland Fish Exchange opened, since stock declines of the early 1990s and associated closures of nursery grounds, and since several regulatory moves restricted gillnetting activities (principally marine mammal protection legislation), the industry has become concentrated in and around Casco Bay, Portland. Investigators visited ports from Machiasport south and west to Kittery, finding one or two gillnetters or draggers per port north and east of Stonington and one or two south of Saco, a community near Portland.

The declines in groundfishing activities north and east of Stonington reflect the problems associated with marine mammal protection and the growth of two alternative fisheries: sea urchins and eels. In addition, a principal dealer in Rockland, formerly a major groundfish port curtailed interest in groundfishing shortly after the opening of the Portland Fish Exchange. The declines in groundfishing activities south and west of Portland reflect the increasing growth and entrenchment of summer recreational uses of the coast, where tourist hotels and other activities—including sportfishing, whale-watching, and recreational boating infrastructures—have reduced access points for groundfishing vessels and fish landing facilities. This does not imply that most of Maine's coast, from Portsmouth, NH on the border to Bath, Rockland, and Acadia National Forest, is immune to these pressures of recreational coastal development. A comparison of 1985 and 1995 aerial photographs of Portland's waterfront, for example, reveals that the principal growth has been condominium and other non-fishing development.

Despite competition from other industries for space, the Maine groundfishing fleet remains active, geographically dispersed across several communities (mostly between Saco and Rockland), and internally diverse with regard to gears, vessels sizes, and involvement in other fisheries. Maine ground

fishermen, their families, the associations they have formed, and those processing and harvesting businesses who buy, pack, and ship their catch have constructed and maintain a complex, interconnected physical and social infrastructure around the pursuit and capture of groundfish.

Maine’s groundfishing fleet has three principal components:

- Vessels ranging from 80’ to 100’ in length that fish, usually, for 10 days at a time. These vessels rarely fish in Maine state waters, usually travelling as far as Georges Bank and beyond and fishing primarily with dragger nets. Crews on these vessels usually consist of a captain and two to three other individuals.
- Vessels ranging from 45’ to 79’ in length that fish for 4 to 5 days at a time, also using dragger nets. Crews usually consist of a captain and one to two other individuals.
- Boats under 45’ who fish for a single day at a time, usually with gillnets. Crews usually consist of a captain and one other individual.

Most medium and large sized vessels land their groundfish at the Portland auction, as well as many of the gillnetters, yet we confine most of our discussion of the small vessel gillnetters to our discussion of Stonington, highlighted in the secondary port section. Larger vessels, clearly, dominate the activity at the exchange and along the Portland waterfront, and medium-sized vessels tile up at harbours all around Casco Bay. In addition to Portland, the Casco Bay area includes the following ports, each of which can be considered an extension of a diverse and widely distributed groundfishing fleet (Greater Portland Council of Governments 1991b: 5):

- | | |
|------------------|------------|
| – Scarborough | Freeport |
| – Cape Elizabeth | Brunswick |
| – Falmouth | Harpwell |
| – Cumberland | Phippsburg |
| – Yarmouth | West Bath |

Portland itself is a diversified community with a complex economy, the centre of a county that boasts the second lowest unemployment rate (between 4% and 7%) in the state (Maine Department of Labour 1994). The civilian labour force in the Portland Metropolitan Area averages 132 290 for the year, reaching lows of 126 050 during the month of September and reaching a high of 138 100 during December, when the unemployment rate drops to 4.3%, largely, of course, because of increases in retail trade around Christmas. Generally, however, the summer months suffer lower unemployment rates than the winter months. Seasonal fluctuations such as these are common throughout the state of Maine, if more exaggerated in smaller, isolated communities that are more heavily dependent on fishing. Stonington’s unemployment rate, for example, fluctuates between a low of 3.1% in August to a high of 10.5% in February. Portland’s economy, by comparison, is much more stable seasonally.

Table 6 shows the distribution of jobs by industrial sector in Portland. These distributions indicate an economy with a strong (but no longer central) manufacturing base and a growing service sector, reflecting national economic restructuring trends. Average wages in the Portland MSA are around USD 10 per hour, or around half of what crew on groundfishing vessels can make (or were used to making prior to the current crisis), and as little as a fifth of what captains were making. Median family incomes in the city were USD 25 600 in 1983 and USD 38 511 in 1990, or an increase of 6.5%, indicating a relatively robust economy.

Table 6. Non-Agricultural Wage and Salary Employment, Portland MSA, 1993

Industrial Sector	Number Employed	Percent of Total
Manufacturing	13 330	10.5
Construction	5 110	4.0
Transport/Utilities	5 940	4.7
Wholesale Trade	8 660	6.8
Retail Trade	28 470	22.5
F.I.R.E.	12 260	9.7
Services	36 560	28.9
Government	16 390	12.9
Total	126 720	100

Commercial fishing, of course, is but one of several industries and cannot be said to be the leading industry in the city, although the port itself occupies a central place in the city's economy and its quality of life. Two waterfront surveys compiled by the Council of Governments in Portland reported that during the recession of the late 1980s and early 1990s, Portland's waterfront businesses expanded and hired more employees, indicating the port's overall importance in the city's economic health (Portland Council of Governments 1992a, 1992b). The MGF is no small part of the port's profile and character, for "good fishing harvests" were mentioned by the Council as primary in keeping waterfront businesses active during these years of economic downturn.

Casco Bay is a deep-water port, extremely sheltered and located only three and one half miles from open ocean. Through the year it remains free of ice, which makes for easy navigation not only for the commercial fishing fleet but also for growing marine traffic related to imports, transportation, and recreation. Much of the development of the harbour in the past ten years has been the growth of condominiums and other real estate development that often competes with commercial fishing for space and aesthetics. Despite these changes, commercial fishing in Portland remains a core industrial segment, important in the city's identity and history. Indeed, those responsible for monitoring waterfront development see non-marine related uses of space along the waterfront as directly tied to marine related uses in positive ways:

“Land owners are clearly a small number of the actual ‘firms’ which are located on the waterfront, yet they have some specific concerns about the amount of under-utilised space along the waterfront. There continues to be a strong call for reviewing the current zoning restrictions from such owners and from some of the renters. Some renters have suggested that the waterfront users could be paying less in rent if the buildings were occupied more fully. In other words, non-marine related uses could subsidise marine related uses”

Portland Council of Governments 1991a

Official publications of Portland’s city government often highlight the central role of commercial fishing, and clearly the Portland Fish Exchange is among the city’s proud accomplishments, being unique in the Northeast and attracting the attention of seafood dealers and brokers in ports such as Gloucester and New Bedford.

A2. *The Portland Fish Exchange and Other Port Infrastructure*

At the heart of the Portland MGF stands the Portland Fish Exchange (PFE), a display auction founded in 1987 on the Portland waterfront. The auction has acquired a reputation for fairness and accuracy of weighing in a region long known for difficulties between seafood dealers and fishermen. Some fishermen we interviewed while landing fish in Portland had recently moved from selling their fish in Boston and New York markets, saying that those markets were far too prone to rounding weights downward, arguing over quality and other characteristics of the catch, and sometimes taking days or weeks to pay for fish. The Portland Exchange, by contrast, provides a setting where fishermen or their representatives (brokers) come together with buyers, every Sunday through Thursday noon, to bid on various lots of fish.

Box 1. One Fisherman’s Summary of the Auction’s Impact on the Groundfishing Fleet

“What it [the auction has] done, it’s taken away not the small fish dealer, but we always called them in the business the “little black hole.” You load your stuff in the basket and it goes up the hoist and into the warehouse or the dealer’s house on the scale to get weighed. And then the basket comes back down empty. We always called it the little black hole. And then the guy said, “Here’s what you had, here’s your money.” And you’re kind of going, “Geez. I thought I had more than that.” It builds some trust, but what ends up happening is you end up guiding your product— you have to stand on top of the wharf and be sure these guys are doing right.

“But you go to the Fish Exchange, there’s no question; everything is weighed on a computerised scale. Everything is tagged, and they off-load the boat for you, so if you want to stand up and watch them. It’s all sorted, everything is sorted and tagged and weighed. And it goes on that floor that way, with your tag on it. So you as a buyer would say, “Yeah, I’m gonna buy from The Mary Ellis,” or whatever the boat name is, if he’s bought before and it’s a good product. And might pay an extra 25 cents if they have to. And that’s how it all works, but you get a computer print-out of what goes in, and you get a computer print-out of where it went and how much it brought and the Fish Exchange pays you. You don’t have to deal with Joe Schmoie the fish dealer or the guy buying. You pay them two cents a pound to put it on the auction; the buyer pays two cents to get it off, and that’s how they make their money—on that four cents or six cents or whatever. And they handle the money, so there’s no question of whether that black hole was gonna give you a check or not.”

Another fisherman we interviewed suggested that the auction's reputation for accuracy has been responsible for fewer disputes between fishermen and buyers that have led to marketing boycotts or protests over what seemed to fishermen to be price-fixing:

"We had a few minor tie-ups because the price wasn't any good; those didn't last very long. Well, the dealer will come down and talk about it, and then they settled it, and then we'd go out ... That was years ago when it used to work that way. And now with the auction, it doesn't work that way. This auction has been the best thing that ever happened to us. We used to give—if we caught a hundred pounds (45 kg) of fish, we got paid for 100, but there was 112 or so in the box. Now we auction, and there's about 112 in there."

Typically, fish are landed at the auction early in the morning, between four and six, separated and weighed, and auctioned off at noon. During the shrimp season, shrimp auctions also take place in the evening.

The exchange employs between 35 and 55 individuals, fluctuating through the year based on weather conditions and the availability of groundfish. With the exception of shrimp, most of the species they land are groundfish species. The Exchange also assembles daily price reports and lists of species landed by vessel, pounds, sizes, and other information, serving as an excellent data source for National Marine Fisheries Service efforts to monitor the conditions of the resource on a daily, weekly, or annual basis (see Table 7).

Table 7. Species, Pounds, and percentage of Total Landings of Major Fish Landed at the Portland Fish Exchange, 1994

Groundfish Species, 1994	Pounds	Per cent of Total Landings
Cod	6 030 605	21%
Dabs	5 340 312	19%
Hake	4 463 607	16%
Monkfish	2 844 204	10%
Pollock	2 447 281	9%
Grey Sole	2 653 791	9%
Cusk	1 278 315	4%
Redfish	309 972	1%
Yellowtails	102 424	<1%
Other	3 138 437	11%

Source: Portland Fish Exchange.

The exchange is the centre of the northern shore of Casco Bay, sitting among several seafood brokering establishments and the Marine Trade Centre, a building that is conspicuously businesslike in appearance, reflecting the self-professed entrepreneurial spirit of the Portland fleet. In an interview with a group consisting of a fisherman's wife, a well-known broker and boat owner, and a past political appointee within the state's marine political apparatus, the point was made that, after Amendment 5 was passed and fishermen in Gloucester and New Bedford began burning boats and turning over cars, journalists came to Portland believing they were not negatively impacted by the regulations, because they were not destroying property. Their response to the journalists was as reasoned as their response to Amendment 5: they said

that they were businessmen and they were responding like businessmen. Simply, they challenged the new regulations in a court of law.

The square brick structure with bold silver letters that read Marine Trade Centre symbolises this stoic and stubborn resistance to what the fishermen of Portland consider onerous regulations. The Centre houses the National Marine Fisheries Service offices, the Maine Department of Labour's Fishing Family Assistance Centre, Maine Fishermen's Wives, and several other marine related businesses or assistance organisations. Dock space along the waterfront, like most heavily commercialised ports, is at a premium. The city of Portland rents space to 22 boats and maintains a transient pier where boats may tie up for three days at a time; this is 100' (30 metres) long and boats can tie up three deep, similar to the vessel stacking in New Bedford. They will have eight more slips in May of 1996, and rarely does a permanent slip tenant relinquish his right to harbour space. This indication of a high demand for slip space is another indication of the tenacity of the Portland fleet and its resilience in the face of proposed restrictions and probable economic declines.

In addition to the complex that includes the Fish Exchange, seafood dealers, and the Marine Trade Centre, the active space of commerce between Commercial Boulevard and the waterfront, as well as the waterfront across the bay, includes several seafood dealers, gear manufacturers, and other businesses that service the fleet and its personnel in a variety of capacities. Several small eating and drinking establishments depend heavily on ground fishermen, both as patrons and suppliers of the raw materials for their seafood chowders and fresh fish steaks.

A3. Demographic Information on the MGF

According to Maine Department of Marine Resources licensing data, the opening of the exchange was followed by an increase in commercial fishing licenses for the first five years of its operation. Between 1986 and 1991, licenses increased from 1132 to 2048, dropping back to 1493 in 1994. From field research on the 1995 license list, however, we know that many fishermen who hold licenses do not fish for groundfish; some purchase and retain licenses either for tax purposes or in the hopes that they will become desirable as commodities under limited entry programmes or future moratoria.

That growth in commercial fishing occurred in Portland following the founding of the PFE is further supported by the waterfront surveys mentioned earlier, conducted in 1992 and covering the years between 1989 and 1991. The survey found that water dependent uses of Portland's waterfront grew from 31% to 36% during these years.

Among the reasons for success of waterfront businesses were three that relate directly to commercial fishing (Portland Council of Governments 1991a: 8): "For the increases [in business activity, including hiring additional personnel], business responding to the survey were very articulate this year. The reasons given include:

- A particularly large volume of lobsters and fish for the harvesters.
- Better prices for fish and lobsters.
- Portland Fish Exchange attracting large-scale buyers".

A much better estimate of the numbers of ground fishermen comes from data available at the PFE: their records indicate that they handle the catch of 384 clients. Of these, between 30 and 40 are brokers or seafood markets/organisations, between 80 and 90 are based in ports in and around the Portland

area, and the remainder (around 250) are based in more distant ports. Those based in Portland are likely to be the larger vessels, with crews of a captain and three to four mates, as are most of the others, given declines in gillnetting and associated declines in smaller boats.

We can use these figures to estimate, roughly, the size of Portland's groundfishing fleet. A rough lower estimate of the number of families directly dependent on groundfishing in and around the Portland area could be derived by multiplying 80 to 90 vessels by 4, or the number of people who generally man a vessel, with a result of between 320 and 360 families. Seafood firms in the Portland MSA report total employment levels of between 240 and 390, and another 110 to 150 workers occupy the sector of the economy known as boat building and repairing (Maine Department of Labour 1994: 141–42), bringing the total to between 700 and 900 families.

This is, of course, a low estimate, and an upper estimate would include all but between 5 and 10 of the 344 who are not obviously seafood dealers or companies. At this end of the range, we derive figures of between 1 670 and 1 880 families. Thus, those directly involved in Portland the groundfishing industry number from between 700 to 1 900 individuals. The actual numbers of individuals who depend on groundfishing for part or all of their income, of course, are much higher, because these estimates do not include those who provide services besides building and repair services (*e.g.* ice, fuel), those who monitor the commercial fishing industry (*e.g.*, Maine Department of Marine Resources personnel, NMFS Port Agents and workers, Harbour Masters), and those who provide a range of other services (*e.g.* banking, insurance, slip rental).

Based on salary data provided in the interviews with fishermen and owners of fishing vessels, those directly involved in harvesting groundfish—captains and crew—contribute, in the aggregate, between USD 12 million and USD 70 million to the Portland economy annually. These figures are based on fairly conservative income estimates, with crews of the larger vessels making around USD 40 000 per year and captains making USD 100 000 per year and captains of smaller vessels making between USD 30 000 to USD 50 000 per year.

To protect incomes of this size, and to preserve the groundfishing heritage of Portland, ground fishermen have not accepted regulatory changes quietly. In addition to marshalling legal actions in response to recent fishery regulations, ground fishermen and other fishermen in Maine have formed several organisations, many of which are organised, staffed, and operated primarily by fishermen's wives.

A4. *Fishing Associations and Organisations*

Because of different fishing territories and practices associated with each of the three groups of vessels (small, medium, and large), they have been differentially affected by regulations, incidents of environmental degradation and ecological change, and issues stemming from conflicts with conservationists, other types of commercial fishermen (*e.g.* shrimpers and scallopers), and recreational and tourist interests (*e.g.* recreational fishermen, whale-watching groups). Reflecting these differences, the groups are represented by different fishing organisations: larger vessels are represented by the Groundfishing Group of the Associated Fisheries of Maine; mid-sized vessels are represented by the Maine Fishermen's Co-operative Association; and smaller vessels are represented by the Maine Gillnetter's Association. The current spokespersons for these organisations live in South Berwick, Cundy's Harbour, and Stonington, respectively.

Not only are these different groups of ground fishermen represented by different organisations, but also interviews with representatives from each of the groups suggest that attitudinal differences between them, along with gear and space conflicts, have made forming a unified fishing association

difficult. Small and medium-sized vessel owners, for example, often characterise the larger vessels as corporate entities, seeing them as less grounded in family ties and less bound to home mortgages than fishers who fish from smaller boats. Captains, who use draggers view gillnets as more ecologically disruptive than draggers, stating that gillnets, too selective, remove species from the biomass unevenly and thereby create populations' imbalances. Gillnetters, in turn, complain that draggers threaten spawning grounds and damage substrates.

These internal sources of conflict are somewhat more pronounced across the Northeast Region as a whole. Maine fishermen from all three groups, nearly unanimously, point to fishermen from New Bedford and Gloucester as being responsible for the problems caused by overfishing; like commercial fishermen nearly everywhere, however, they also claim that overfishing is only one of many causes of declines in cod and other stocks (particularly citing pollution and habitat destruction) and routinely disagree with scientists from NOAA and universities regarding the conditions of different stocks.

Interestingly, each group seems to believe the others are better prepared than fishermen like themselves to deal with regulatory and ecological crises: the larger operators view the smaller as more flexible, while the smaller operators view the larger enterprises as having more capital to invest in gear modification and exploring alternative fishing strategies. Both groups point to investment capital as a problem, but from different perspectives: the larger vessel-owners say they have too much capital invested to stop fishing and the smaller vessel-owners say that gear modifications and alternative fishing strategies would require capital investments beyond their means.

Despite internal divisions, the Maine Fishermen's Wives Association represents all fishermen and fishing families in the state, and the other groups come together from time to time around certain issues related to stock assessments and new regulations. In addition, several other public, private, and quasi-public organisation act as informal and formal lobbyists for all Maine fishermen and fishing families, ranging from the Island Institute in Rockland to the Maine Fisheries Commission to the Maine Sea Grant College Programme. It is difficult to say, however, that any agency, organisation, association, or group speaks for all fishermen in Maine all of the time, yet at least once per year they are able to come together in the Maine Commercial Fisheries Forum.

A5. *Social Dimensions of Portland's MGF*

Like fishermen throughout much of the United States, many of those we interviewed in Portland either descend from long time fishing families or have worked in fishing or fishing-related work since they were in their teens. Interviewing a father-son team of ground fishermen, for example, elicited the following statement in response to our inquiries about how they got into fishing:

“Well, my father fished and my aunt fished and my sons fish, and my brothers fish, my uncle fished, my cousins fished—the whole family fished—because there wasn't a very wide selection when they came to the country in 1920. It was either work in the mills—which Portland didn't have any but very few—or longshoremens. And this wasn't a real good farm area, so we took to fishing.”

Commonly, fishermen took up fishing practices primarily because, compared with other occupations, fishing paid relatively well and required no extensive education beyond the day-to-day apprenticeship of fishing. Those born into fishing households typically grew up around boats and fishing and learned the industry at a young age, although some fishermen claimed that their children either loved or hated fishing, and simply being born into a fishing household does not seal one's fate into a life of fishing. This is especially true today, with the negative publicity surrounding the future of fishing,

particularly groundfishing. Despite the pleas of some fishermen, who now desperately need crew who are willing to stay with fishing for years to come, fishing households are having trouble reproducing themselves. A thoughtful account of the difficulties captains have recruiting crew links crew recruitment problems to credit and capital development issues as well:

- Interviewer: “Is it tough to find good crew?”
- Fisherman: “Yeah, now it is; it’s getting hard because young people aren’t interested in getting into it because of all the publicity and all the rules. So I can’t say as I blame them, it’s hard work. The guys get paid pretty well out of it.”
- Interviewer: “And they earn their money.”
- Fisherman: “Oh yeah. But a lot of people don’t want to be going away from home. If you’re gone for four or five days, and then they’re in for two or three, and then they’re gone again. Like the bigger boats are gone for 10 days or 12 days, and then they are in for 4, and then they’re gone again. Especially if you’re married and got kids, it’s not much of a life. I can’t say as I blame them, but it’s, you know, it’s not the opportunity there for the young person to come and say, ‘I’d like to go fishing with you and learn the business.’ I’ve taken guys. You can tell right away if they’re gonna be any good or not. And I’ve had a couple of them that I had to advise that, ‘You’d be better off going back and working on shore. You’re never gonna make it.’”
- Interviewer: “Why is that?”
- Fisherman: “Oh, they don’t have any idea in the world what they’re doing out there; they really don’t. They’re lost. And then you’ll get some guy that comes along and think, ‘This guy’s gonna be good.’ And you keep him and after a while, he knows this and he knows that, and then you can teach them, but it just takes experience to learn where to go to catch the fish, and how to tow along the bottom and do this and do that. There’s an opportunity there for people, but the government didn’t leave many windows for these young people to save their money and buy a boat and start like I did. You know, I started with a lobster boat, then I went to a bigger lobster boat, then I bought another small dragger, and then I worked on big draggers and saved my money. And then I bought another dragger that was a little bit bigger.”

Within the Portland fishing community, it is not uncommon for fishermen born into fishing families or those who eventually become crew to try out non-fishing jobs during their younger years, usually in and around the water. This would include operating ferries, building or maintaining boats, or performing other shore side tasks. A few fishermen we interviewed, especially those operating smaller vessels, moved between fishing and shore-based employment on and off over the course of their professional careers; we may think of this as yet another extension of moving between fisheries through the course of several seasons or from year to year, adapting vessels, modifying gears, and targeting different species based on stocks, regulations, and crowding problems. We will discuss methods of adapting to crises in more detail below.

In the process of moving between shore, water-related occupations and fishing, either as crew or as part-time fishermen/captains themselves, fishermen gradually gain the trust of the established fishing community and slowly become accepted into its ranks. Because there is a history of regulatory pressure, persistent perceptions that the fishing way of life is being criminalised, untrustworthy marketing relationships, and the necessities of interdependence between captains and crew at sea, developing trusting relationships is a slow and often painstaking process that permeates the fishing community. By the same token, the difficulties of forming long-term and trusting relationships make those that have been formed all the more important as components of the overall social infrastructure of groundfishing.

Considered as part of the economic health of groundfishing, working in and around the water, moving between fishing and shore-based employment, and occupying different positions on different kinds of fishing vessels has been important to the ways in which the social capital of groundfishing develops and becomes available for investment in a productive fishing enterprise. By social capital we refer to those network relationships—between captains and crew, captains and suppliers, among crew or among captains, and between captains, owners, and creditors, and so forth—that enable partnerships designed to generate incomes. In fishing, the development of fishing skills and knowledge about fishing grounds, the willingness to adhere to captains’ safety standards, the ability to remain at sea for extended periods, etc. are all attributes we normally consider human capital. Yet human capital in fishing is useless without the web like partnerships that link fishing vessels to credit systems for financing, fuel, ice, trip food, etc.—without, that is, social capital, and the trust upon which the mobilisation and investment of social capital depend. Comments from one of our respondents show how extensively entrenched are relationships based on trust and credit and how they may be negatively impacted by negative publicity about the fishery:

“Well, you have to see ramifications of this whole publicity thing. Like I’ve had an account with Shaw Supermarket, a charge account, for a long time. And when I got the second boat, I called them up and I asked them for another charge account for the other boat, and they wouldn’t give me one. I said, ‘Why?’ and they said they were phasing out their fishing boats because their credit and liability wasn’t too good. I says, ‘Have I ever missed a payment?’ and they said, ‘No, your credit’s very good.’ As a matter of fact, they asked me to stop paying like I was paying, wanted me to go on paying them every 30 days. Basically what I do is when a boat comes in and I do a settlement sheet and I pay them and then I get all the bills and I pay all the bills and I put it in the mail and send it to them. So if I had a bill from Shaw’s for USD 257, I sent them a check for USD 257 with the account number on it. Well, they didn’t want me to do that anymore. They wanted me to wait ‘til they send me a statement and then pay the statement, because it was confusing the bookkeepers, I guess. But they would give me another charge account, because they felt the fishing industry was going down. There are a few places like that. A year ago I put a new winch engine into one boat, and I really had to get a great recommendation from the Caterpillar Company to the guy who would come down and wrap the exhaust pipe with insulation, because he said, ‘I’ve been stiffed by fishermen. I don’t even want to touch you guys’.”

If credit relations, in the fishing industry, are enhanced by trust, so too are they particularly susceptible to pieces of information that chip away at that trust. This occurs, moreover, within an industry whose participants have been prone to considering attacks on their ways of life as stemming from a conspiracy of environmentalists, government personnel, and recreational fishing and tourist interests. While these sentiments are widespread throughout the fishing industry of the United States (*see* Fritchey 1993), the ways fishermen act on them, responding to what they perceive as crises and to very real restrictions of their fishing activity, vary from port to port.

A6. *Adaptations and Adjustments to Crisis*

Maine fishermen and fishing families are adjusting to negative publicity in fairly predictable ways, based on their past adaptive responses to various political, economic, and ecological crises: specifically, they respond with a combinations of experimenting with alternative survival strategies, protest, and resistance. Maine fishermen consider themselves innovative and entrepreneurial, as noted above in the discussion of the Marine Trade Centre and the measured response to Amendment No. 5, and their responses to new fishing regulations have been fashioned along typical business lines, including challenging the state on legal grounds and investing time and income in alternative uses for their vessels.

Like fishermen in the Gulf States and up and down the eastern seaboard, Maine fishermen perceive their way of life being criminalised, largely unjustly, due to either environmentalists' interests or to fisheries biologists who regulate fishing based on inaccurate data. Holding such viewpoints, they consider regulations with suspicion and often view them as illegitimate or even morally reprehensible. This justifies, in their own minds, protest and resistance by legal and illegal means.

At the same time, Maine fishermen adjust to crises—whether politically instigated or not—by experimenting with options within and outside of fishing. Within fishing, this involves moving into new, similar fisheries with the same gears, making modifications to gears and vessels for compliance purposes (or sometimes to circumvent regulations), making modifications to enter qualitatively different fisheries (moving from net-based fisheries to trap-based fisheries, for example), or exploring new fishing territories. When switching from fishing to shore-based employment, many fishermen remain tied to the industry in an altered capacity, engaging in work in seafood establishments, vessel repair operations, and so forth. Consider the comments of a long-time crewmember that, in the current climate, has had little difficulty finding work because labour recruiting pools for crew have deteriorated in the wake of negative publicity about the groundfishing stocks and the industry's future:

“Last year I groundfished the entire year; I was on a different boat than I'm on now. And I swap around; I go where I want to go. That's one of the appeals of this business, particularly at my level of it. I've run boats; I've been shore engineer—that was the third thing that I did when I quit actually fishing—was maintain boats for the outfit that I'm working for now. When boats came in, I took care of any problems that they had. I knew the boats around the harbour, take out fish and so forth, and fuel them and ice them, and get them ready to go out again so that the gangs could go home.”

Because of the economic importance of lobster in Maine, one of the most devastating potential problems to emerge in the wake of a deteriorating groundfish industry is the movement of smaller vessels into lobstering and the practice of larger vessels illegally dragging for lobster. While it is illegal in the state of Maine for ground fishermen to land lobster they have caught with nets, fishermen in the southern portion of the state can relatively easily travel to Boston markets to sell lobster they have captured in their nets and we can expect such practices to increase under more restrictive fishing regulations.

A7. *Conclusions*

Maine fishermen are adapting to new developments in fishing regulations in ways that are in line with their historical participation in the fisheries: by resisting regulations through legal and illegal means while experimenting with new gears, new species, and new on-shore economic opportunities. The concentration of the fleet around the PFE has meant that those fishermen based in and around Portland are likely to be more heavily impacted by further groundfishing restrictions than those in other, smaller ports, where lobster fishing prevails. Although the Greater Portland economy has a broad and diverse base,

ground fishermen in this area will be unlikely to find comparable work with comparable incomes outside groundfishing; in addition, of course, they face the loss of large investments in fishing vessels and gears with the collapse of the industry.

B. Gloucester, Massachusetts

B1. Overview of Gloucester Groundfishing

Founded in 1623, Gloucester has been a fishing port for the last 372 years (Vickers 1995). The Dorchester Company settled on Cape Ann and established the Massachusetts Bay Colony here in 1623. Prior to that time, vessels came to Cape Ann to fish in the summer months and returned to England with their salted cod before winter. Staging to dry codfish in the sun was set up in what is presently known as Stage Fort Park. Dried cod was a major export for centuries. Groundfishing is still the dominant fishing activity, and is pursued with gillnets, longlines, and dragging gear. Inshore lobstering is of lesser importance, but landings of lobster as secondary product have increased among the dragging fleet.

Unlike the Maine fisheries, groundfishing is not summer oriented, but employs fishermen in a year-round activity. Table 8 shows the reported/preferred fishing activity for 75 respondents (74 captains, 1 crewmember) of a 1995 survey. This confirms the preference for groundfishing as a primary fishing strategy in Gloucester. The impact of new groundfish regulations will be more deeply felt in Gloucester than Maine due to a high level of capital invested in groundfishing and the large population of deckhands dependent on bottom dragging.

Most of the fish caught in the first 200 years was for export or regional consumption. When the railroad came to Gloucester in 1848, it opened the local fishing commerce to a wider national demand for fish. Boston and New York became major fish markets. The railroad also spurred tourism, and many hotels were constructed to fill the demand. People came to Gloucester for its fishing and to experience the natural beauty and cultural heritage of the port. This process of tourist development and gentrification has accelerated in recent decades. An important component of Gloucester's identity, enhancing its tourist industry, is America's oldest art colony—the Rocky Neck village within Gloucester. Scenery and architecture of the Cape Ann area has inspired generations of painters and sculptors.

Tourism, conversion to a bedroom community, and local high-tech industry has transformed historic Gloucester as it continues to diversify economically and culturally. Light industry accounts for thousands of new jobs in the area.

Table 8. Reported Vessel Activity by Gear Type and Target Species of 75 MGF Respondents

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Gear Type</i>												
Drag	33	34	35	35	35	32	31	31	30	32	33	34
Lobst	7	7	4	4	5	5	4	4	7	8	9	8
Lobst	8	6	6	10	10	11	11	12	12	13	12	12
Gilln	4	4	6	8	11	11	10	8	9	10	8	8
Long	8	8	9	15	12	16	16	14	13	13	9	5
Other	–	–	–	–	1	1	1	1	1	–	–	–
Party	–	–	1	1	1	1	1	1	1	1	1	–
Elect	–	–	–	3	4	4	4	5	5	3	2	2
Scotti	2	2	2	2	2	2	2	2	2	2	2	2
Divin	–	–	–	1	1	2	2	2	2	1	–	–
Other	–	–	1	1	1	1	1	1	1	1	1	–
<i>Target Species</i>												
Grou	35	37	43	51	52	46	41	41	42	42	39	34
Herri	8	8	8	9	11	15	17	16	16	14	13	12
Mack	7	5	6	8	12	12	8	9	10	11	8	6
Dogfi	6	5	6	8	14	25	26	25	21	11	7	6
Whiti	7	6	6	7	8	12	13	14	17	17	17	12
<i>Ilex</i>	4	3	3	3	5	5	6	7	7	5	5	3
<i>Lolig</i>	3	2	2	2	3	3	4	4	4	3	3	2
Sea	14	9	6	6	5	5	5	5	5	7	9	12
Hagfi	1	1	1	3	3	4	4	4	4	3	2	2
Shri	21	18	13	12	9	6	6	6	6	5	5	12
Butte	3	2	2	2	3	3	4	4	4	3	3	2
Mon	–	–	–	1	1	1	1	1	1	1	1	1
Tuna	–	–	–	–	–	1	2	2	2	2	–	–
Blue	–	–	–	–	2	2	2	2	2	–	–	–
Strip	–	–	–	–	–	–	1	1	1	1	–	–
Scall	1	1	1	1	1	1	1	1	1	1	1	1
Other	2	2	2	2	2	2	2	2	2	2	2	2

“–” = none.

Source: GFWA, 1995 Survey.

Gloucester's historical dependence on fishing is revealed in the art and architecture of the community, both religious and secular. Committing resources for the creation of occupationally specific art and architecture shows a deep community dependence on that occupation. Examples include Our Lady of Good Voyage Church, the Gloucester fisherman statue, and the entrance mural of St. Ann's Church. A recent event of significance is the dedication of the plans for the statue of the fisherman's wife. The commission for this community symbol went to a local artist, and a recent ceremony commemorated the commissioning of the statue, which should be completed in three to five years.

Fishing life symbols do not occur in isolation. They are integral parts of social rituals. Rituals are repetitive seasonal actions that reveal the most deeply felt values of families and households (Turner 1967). Rituals of saint worship, of the blessing of the fleet, and seafood festivals are integrated with the secular and religious symbols that are a part of the cultural landscape of the community. Symbols and associated rituals are also representative of persisting social arrangements. Such arrangements include working crews, family networks, social clubs, fisher-processor credit relationships, and fishing associations.

Although commercial fishing is still a primary industry (Gloucester was ranked second in 1995 in tonnes landed on the eastern seaboard) light industry and the service sector are gaining in importance, and foreign imports have taken the place of domestic landings for some local processors. The community's largest fishery employer, Gorton's of Gloucester, processes and markets imported fish only and has not purchased a pound of locally caught fish in 30 years. This is because foreign labour and harvesting costs are lower, there are fewer restrictions and the supply is, therefore, more predictable. Most processors have looked to foreign suppliers to keep their businesses going. Their interests are not as linked to the fate of the local fishing fleet as in the past.

Besides experiencing a reduction in fishing fleet and sporting infrastructure of the past twenty years, the contemporary fishing industry of Gloucester has gone through many changes. These are due to technological innovation, competition, and recent scarcity of certain fishing stocks along with increasing competition among a diversity of stakeholders (Poggie and Pollnac 1980; Hall-Arber 1994). Reductions in days at seam closure of large areas, loss of the Grand Banks in The Hague Line decision and decline in stocks have reduced the viability of the groundfishing fleet. Nevertheless, local fishing and related businesses still employ and estimated 40% of Gloucester's population. Businesses that support the local industry are small, locally owned and operated. Estimates made on the impact of regulations for Amendment Seven to the Multispecies Plan will eliminate more than 50% of these locally based businesses (NMFS socio-economic impact study, 1994).

There are many occupational roles that support the local fishing industry. These include processing plant workers, lumpers, ice providers, truck drivers, electricians, boat operators/owners, deck hands, gear suppliers, lawyers, social service providers, welders accountants, engineers, fuel suppliers, seafood processors, marine railway owner/operators, refrigeration service, surveyors, and charter boat owner/operators.

The commercial fishing fleet is divided into four major gear groups. These are mobile gear (draggers) and three categories of fixed gear (gillnets, longlines, and lobster pots). Other types of commercial fishing include jigging, harpooning, diving for sea urchins, and various types of trapping. Salmon aquaculture is being considered by one processor, but has been held up for five years because of regulatory and financial barriers. Other uses of marine resources include recreational and sport fishing, and seasonal whale watching tours. Groundfishing with mobile gear remains the predominant fishing strategy in Gloucester.

The traditional fishing fleet of Gloucester has been ground trawlers, using stern or rarely side trawling techniques. As in Maine, Gloucester's groundfishing fleet has three principal components:

- Vessels over 70 feet (metres) in length that fish from 7 to 10 days at a time. These vessels fish the Gulf of Maine south in deeper waters primarily with otter trawls and occasionally offshore gillnets. Traditional crews of 10 to 12 have been reduced to 4 or 5 individuals. As of 1994, the city of Gloucester had registered 34 fishing vessels over 70 feet. However, only 25 of these are offshore vessels, and the other 9 are too old to fish offshore and are restricted to work as medium or day boats.
- Vessels ranging from 50 to 69 feet (15 to 21 metres) — called medium-sized vessels. Crews of two to three individuals fish with dragging gear from 3-5 days in near-shore waters. As of 1994 there were 50 of these vessels.
- There are also 236 fishing vessels up to 49 feet (15 metres). These vessels are considered day boats, and fish with gillnets, longlines or otter trawls. Crews consist of one to two individuals.

Most of the fleet lands their fish in Gloucester, although larger vessels may land squid and other species in Portland or Rhode Island. There has been a significant decline in landings due to restrictions on days at sea and area closures. Vessels of all sizes have been affected, although the larger vessels are having the most difficulty. An informal survey of Massachusetts ports reveals that over the past two years, more than 30 vessels (scallopers and/or draggers) have left the fishery all together, have moved to a different region or even country, are waiting to be scrapped or are too expensive to re-outfit (Collins 1995). In New Bedford, a total of 83 vessels have dropped out of the fleet over the last five years (New Bedford Seafood Coalition, 1996).

B2. Port Infrastructure and Marketing

The fleet here is highly concentrated inside an extremely sheltered harbour, and affordable docking space is at a premium. With the introduction of ice plants in the late 1800s, iced fish could be marketed throughout the eastern seaboard, establishing Gloucester as one of the primary seafood ports in the nation. The existing processing and cold storage facilities have a combined capacity of nearly 95 million pounds. Replacement of this infrastructure would be prohibitively expensive if the fishery was allowed to collapse. The modern state dock, built in 1982, was recently renovated with funds from the Economic Development Administration. There are deep draft berths for 64 commercial vessels at the state fish pier. However, the high docking fees and insurance requirements have kept most commercial vessels off this dock. Scattered among the working vessels are charter boat facilities and whale watching firms that have been taking over spaces vacated by a dwindling groundfish fleet. Space limitations mean most of the vessels must have some arrangement with a processing facility or dealer in order to tie up their vessels.

Docking arrangements with facilities such as the historic Gloucester Marine Railways have changed over time with escalating industry costs. Some of the processing facilities have only a few spaces, others have upwards of twelve, and others may have more. The lobster fleet pales compared with the groundfish fleet, however, unlike the Maine ports, where the opposite is true. Large dockside corporate firms, along with some Japanese capital investment are mixed with smaller seafood buyers and processors, boat docks, and ice, fuel, and oil suppliers.

Major infrastructure components of the Port of Gloucester include the following:

- Fish marketing/processing
 - Star fisheries (local, imports)
 - Gorton’s of Gloucester (imports only)
 - Americold (local)
 - Fuji USA Investments
 - Ogawa USA, Inc.
 - John B. Wright Seafood, (local)
 - National Fish (fish broker)
 - S. Parisi & Son Seafoods, Inc. (local)
 - Mortillaro Seafood and Lobsters
 - Al King and Sons Lobster company (East Gloucester)
 - Steve Conolly Co. (local)
 - Captain Joe & Sons, Inc. (local)
 - FBI Fisheries (local)
 - Good Harbour Fillets (local)
- Fishing supply/repair
 - Cape Pond Ice Company, (ice products)
 - Gloucester Marine Railways, dry-dock repair
 - Ship Lantern Supply (buys local fish, and sells safety equipment)
 - Roses Oil- dry-dock repair, sells fuel, oil and gear.

Box 2. Globalisation in Fisheries

Today, international demand for seafood from Gloucester sends landings worldwide. According to one local observer:

You have companies from all over New England that are servicing Gloucester. Trucks are delivering to New York and other fish markets, directly to wholesalers, directly to restaurants. In other cases you have people that are catching bluefin tuna that are heading and gutting the carcass, boxing it in a wooden coffin, packing it in good Gloucester ice, and shipping it to the Tokyo Fish Exchange. We've seen a tremendous growth with slime eels in Gloucester now and the sea urchin business— there are at least a half dozen businesses now employing hundreds of people to pick. The low-wage labour coming from out of Gloucester now, the new immigrant work forces—Cambodians or whoever coming from Chelsea and Lowell and other places—coming in by van and processing sea urchins to export to Korea and Japan.”

The greater dependence on groundfishing in Gloucester as compared with Maine ports also means a greater potential for economic dislocation from a crisis. Overall, support infrastructure is at a premium, and there is little that could be lost without this having a major impact on the ability of the present fleet to operate.

The decline in the fish processing capacity has not yet included transition into alternate shore-side activities, although a herring processing operation and a fish exchange are planned. As one support factory owner points out:

“There have been a number of steps that have been adverse for the Gloucester community. When the Dehide (fish dehydration plant) was closed down and then not replaced, that was in 1984 and that was something that the people had never conceived of as being a long-term scenario. They thought there was gonna be a replacement coming into place, that people would be processing fish waste economically in some form or another. And that hasn't happened now for 12 years. There have been small-scale solutions with bait and with hydraulasafe fertilisers from by-products and things. But there's no market for the volume pelagic waste.”

Despite the internationalisation of the market, there has been a steady decline in local processing and marketing capacity. The fish dehydration plant employed hundreds of workers for decades until it was closed in 1984. There are presently a dozen local buyers, including five processors. This is in contrast with dozens of buyers in Gloucester before the passage of the Magnuson Act. A great deal of ambivalence exists about the consequences of recent changes in the size of the fleet and seafood dealers' attempts to hang onto old markets or explore new marketing options.

The history of fish marketing has been characterised by an unbalanced economic relationship that favours the buyers. Taking advantage of fishermen is not uncommon, yet recently the balance has shifted from dealers to favour fishermen to a greater degree, largely because of the increased competition for the dwindling fleet of suppliers. As the number of markets decline, the options available to the remaining suppliers also becomes more uncertain as there is a decrease in the flexibility of the market due to reduced competition for product. However, even though there are few markets, the fleet or large dragners in Gloucester is so reduced as to *increase* competition among dealers for the remaining fishermen.

Fish are generally sold whole frozen and shipped to secondary markets where they will be processed to their consumer form. It is ironic that Gorton's Seafood of Gloucester exclusively processes foreign quick frozen product (QFP) in lieu of local fish. There has been added strain at Gorton's with locals as they have upgraded their processing systems and eliminated labourers by automation and by raising the minimum educational requirement for hiring to the GED level. Housewives and other ethnic workers with limited education and poor English skills, formerly able to find jobs in fish processing, have lost their jobs.

Today, higher fish prices mean that processor/marketers don't need to run as much fish through their facilities to remain viable. This does not help the suppliers (fishers), who are competing for a scarcer product and increasing costs. Thus there are both negative and positive consequences of a shrinking fleet, fewer overall pounds of fish, and increased ex-vessel prices; this results from a marketing system that has, historically, incorporated uneven power relations between fishers and dealers into its operation. In an earlier study of the New England fresh fish market, Wilson (1980) found that the situation surrounding individual transactions between fishers and marketers was not based on free competition for fair prices. Instead, the system was relatively inaccurate, slow and unequal in the distribution of information about market conditions to buyers and sellers, resulting in a high degree of uncertainty surrounding any particular transaction.

Another problem was the private ownership of facilities for off loading boats effectively precluded the existence of spot markets with many buyers and sellers. The establishment of implicit contractual arrangements traditionally mitigated these arrangements. For example, in Gloucester, fishermen would be given credit for the purchase of fuel and ice with the implication that they would sell their catch through certain buyers, and that the debt accrued would be paid back with the catch:

"It's fairly simple. The boat is extended credit typically, unless he's lost his credit. But the boat pulls up, he takes on ice, and the concept is it's the same as the fuel, the groceries to feed the crew—that when he comes in, that comes off the top of the trip as an expense of the trip that is paid, and then what's left over goes to the crew and to the owner and the skipper."

— Ice Plant Operator

Debt relationships extended to the wider community to include bank loans for boats and second mortgages, food credit advanced at local grocery stores, and delayed payment on supplies and services from gear and repair shops servicing the industry. Being relatively long-term bilateral exchanges further mitigated traditional market arrangements.

Wilson (1980) reported that more successful cases that were parties to bilateral arrangements tended to experience better access to relevant market information, leading to more effective resource allocations. Bilateral credit relationships have almost universally disappeared in the highly uncertain atmosphere of the fisheries today.

In the past, arrangements further tended to constrain potentially opportunistic acts by one party or the other. This did not provide for sufficient flexibility in the market place to favour suppliers. Wilson noted that what appeared to be highly significant about these relationships is that "their widespread use tends to reduce seriously the amount and quality of information generated by the market" (1980: 3). One remedy to improve the equity of price and market information has come in the form of the fish auction based on the Portland model discussed above. Star Fisheries in Gloucester is seeking state funds to open a local fish market. They see this as an opportunity to add value to local product and expand the market share.

Quality fish at high prices should help local fishermen get into new markets. Also, they anticipate creating many shore-based jobs for displaced fishermen (crewmen and owner-operators). Initially, 25 jobs are anticipated from the market, with predictions of up to 100 in early development to 300 in later development. Job qualification for the market fits the profile of displaced/retired fishermen. Individuals are needed who have hands-on familiarity with fish, and whom can also sort and grade fish for quality. Fishermen can do this, without any significant retraining activities. Most would not have to speak English or have any other skills that they do not already have from working in the fishery.

A local fish auction in Gloucester would potentially compete with the market in Portland, which presently draws fishers from Gloucester and other ports outside of Maine. A smaller auction is in place in New Bedford, but does not have the draw that the Portland operation does. There, the large processing sector still dominates the flow of market product and information.

Similar to the relations that emerged between bankers and farmers in the Midwest following the 1980s farm crisis, credit relations between banks and fishermen and between marine suppliers and fishermen have deteriorated under the weight of negative publicity about groundfishing and Amendments No. 5 and No. 7. Traditionally, suppliers of marine services and trip supplies advanced captains oil, fuel, and ice, and captains could postpone paying repair costs on their boats until they had brought in a good catch.

Five years ago, fishermen could also easily get loans and credit from banking institutions in town, and some linked their home mortgages to the boats when they purchased them, or when they made major repairs on the boats. A 1995 survey of 75 groundfishers in Gloucester reveals that 20% (15 out of 75) have their homes attached to a fishing vessel mortgage (GFWA). Today, it is virtually impossible to get a loan; fishermen report that banking institutions are telling fishermen that they are "getting out of the fishing business" and cannot risk investing in fishing.

As with the Portland case reported above, grocery stores also used to lend fishermen money to go out, but this practice has stopped. Credit relationships with processors have disappeared with increasing economic pressure on the industry, creating subsidiary problems in the support sector. One supplier of fishing gear was stuck with orders that have been purchased but not paid for or picked up. He is waiting for back payment from some fishers, but they have not been able to fish because of regulatory or boat repair costs.

The Marine Railway is also charging dock fees, which was not done in the past. This has created bad feelings with long-standing customers. However, the ability to pay fees has put pressure on the owner to collect on old or delinquent bills. The GMFR can no longer extend credit to fishermen (it is recuperating after a Chapter 8 Bankruptcy filing). The fuel, ice and other products sold by processors are more than the demand, thus there is competition among the processing sector for the business of an ever shrinking population of fishers who have an ever shrinking capability to repay.

Obviously, fish marketing in Gloucester is currently in transition. Old systems of debt, loyalty, and uneven power relationships between fishermen and dealers have been eroding under the economic difficulties and negative publicity facing the fleet yet new systems have not been developed to deal with new political economic realities. Any potential increase in ex-vessel prices for groundfish deriving from a shrinking fleet and reduced volumes of fish have been off-set by increased reliance on imports driving down prices and new markets for formerly under-utilised species such as dogfish (key respondent). Combined, these factors have generated additional instability in a market long characterised by uncertainty and inaccurate information.

B3. Demographic Information on the MGF

Overall, there are 322 permitted vessels for the groundfish alone in Gloucester. These vessels employ 826 fishermen. The 826 fishermen families include about 500 wives and 1 000 children. Average family size in the fishing industry is 5. This means that the total directly on fishing is approximately 5 630. Those in the support industry who are indirectly dependent on fishing include approximately 5 200 workers and businesses owners/operators and their families, for a total fishery dependent population of approximately 10 830. However, all of the residents of the Gloucester community benefit from the waterfront and traditional character of a community steeped in fishing history. Tourists and artists are attracted to Gloucester because it represents a working fishing port, not just another seashore community.

Many of the residents of Gloucester are descendants from Nova Scotia who came to Cape Ann in the last century. The traditional fishing peoples have included Canadian, Scottish, Yankee, Portuguese, with most of the present fishing population of Italian descent. A large number of these fishermen have come from fishing ports in Sicily. They came over here “seeking a better life.” Migration was based on social networks and kinship. Once a family was established with one or two individuals, others would be urged to join them.

Just under 40% of the 27 000 residents of Gloucester are Italian Americans, having arrived in two primary waves of immigration. The traditional fishing family structure consisted of extended kinship networks of fathers, brothers and cousins who worked together on draggers. While men were responsible for fishing and earning money, women took care of the household, onshore finances and childcare. This arrangement provided a very satisfying lifestyle that has been severely strained by the fishing crisis. One respondent put it as follows:

“I think the perception of what regulations will do is driving them all crazy, because they’re feeling it. Within the last two years, the changes have been such that you’re seeing not only that movement—if they stay, wives out working, I mean, I’ve never seen this large a population now of wives working than in the 80s. For a wife and mother—that’s all she’s known, to have been in the home taking care of her family and her children—it makes a tremendous impact. Most of them—for some of them that have some education, well, the jobs that they’re finding are a little better, so that their hours are more regulated. But there are still stresses, for the people that have menial tasks or menial jobs, because they’re limited in education. Cleaning house, they’re going through hell to make their schedule work, their children’s schedule work. Within the last two years, the impact has been unbelievable.”

Many women now work outside the home, and men who traditionally would spend most days outside the household at sea or on the docks find themselves spending more and more time at home. Limitations on days at sea, increase operating, repair and insurance costs makes this necessary.

Recent immigrants from Southeast Asia and Latin America and mostly employed as labourers in the processing of sea urchins. They commute from outside areas to work, and by not participating in social or religious organisations, they are not considered permanent residents. Of the 28 000 residents in Gloucester in 1993, 15 800 residents were 16 years and over and working in the labour force. The rounded figures by category of employment are given in Table 9.

Table 9. Wage and Salary Employment, Gloucester MMP, 1993

Industrial Sector	Number Employed	Percent of Total
Managers/professionals	3 900	25%
Technicians/administrative	4 100	26%
Service occupations	2 100	13%
Fishing/forestry	400	2.5%
Precision products/crafts	1 900	12%
Operators/fabrication labourers	2 200	14%
Self-employed	1 200	7.5%
Total	15 800	100%

Source: Gloucester Chamber of Commerce

B4. Fishing Associations and Organisations

As in Portland, the fishing associations tend to form around gear types. Real and perceived gear conflicts have made it difficult for fishing organisations in Gloucester to co-operate with each other. The oldest fishing association in Gloucester is the Gloucester Fishermen's Wives Association (GFWA). It was founded in 1969 to promote the Gloucester and New England fishing industry as well as improve the quality of life of active and retired fishermen and their families. Most members of the GFWA are associated with the offshore dragger fleet. The GFWA consists of 125 members representing both captains and crewmembers. Past and ongoing activities of the GFWA include:

- Lobbied for enactment of the Magnuson Fisheries Conservation and Management Act and for the recent re-authorisation of the act.
- Worked with the Fishermen's Family Practice Assistance and Retraining Centre to help fishermen who elect to pursue other occupational roles or who are looking at ways to decrease their impact on particular fishery resources by diversifying their fishing related activities.
- Lobbied for the ban on oil drilling in the Georges Bank.
- Lobbied to establish the Stellwagen Bank Marine Sanctuary and continue to work with conservation organisations and government agencies to protect the sanctuary
- Published a seafood cookbook, *A Taste of Gloucester*, that promotes under-utilised fish species with the aim of taking pressure off traditional stocks (over 90 000 copies sold)
- Opposed ocean dumping of toxic wastes.
- Sponsored international exchange programmes with fishing families.

- Sponsored educational programmes to promote lesser-known fish for food consumption, develop a greater understanding of the local marine ecosystem, and connect schools with jobs through mentoring programmes.

A significant recent activity of the GFWA has been the promotion of the Massachusetts Fishermen's Partnership. This partnership has as a primary purpose the forging of alliances between fishermen of all gear and geographical sectors for the purpose of conserving and sustaining fishing communities and the marine resources they rely upon. An important issue currently being addressed by the partnership is the development of a comprehensive health care plan for fishermen. Caritas Christi is a Catholic health organisation that can develop a health care plan for fishers and their families. As noted in the MFP meeting minutes (4/26.96):

“Caritas Christi was approached last summer by Cardinal Law and Senator Kennedy's office to “fashion a brand new health plan” for the fishermen of Massachusetts. Kennedy secured an EDA grant to fund the project. David Bergeron, Jim Kendall and other MFP participants have already spent a considerable amount of time assisting in the development of a survey which is being conducted by Health Care for All. The survey was sent out in the spring and early summer of 1996 and responses provide information in four broad categories: (1) current health status, (2) present care providers, (3) how people pay now, (4) people's interests in the plan” (MFP 1996:2).

The survey, designed with fishing community input was sent out to 934 individuals, with 485 surveys returned. The questionnaire was designed with a cultural understanding of Massachusetts fishers, their families and communities. Aggregated results of the survey are available and will be incorporated into a phase-II (SIA) study of the New England MGF.

The Gloucester Fisheries Commission was established in the 1950s to organise the fishing industry. It is the only municipal fisheries commission in the state, and advises the mayor and city council on measures for promotion and protection of the Gloucester fishing industry. Members of the commission include the Chamber of Commerce, the Fish Pier Advisory Board and four members at-large. Members are appointed by the Mayor and confirmed by the City Council.

The Cape Ann Vessel Association represented the larger mobile gear vessels in Gloucester until it broke up several years ago (David Bergeron, personal communication). The association, formerly including 68 vessels, leveraged an insurance programme for members who provided an economic incentive to belong, but insurers were able to offer the programme to non-members, which removed this incentive. The association continues today with just a handful of vessels.

The Cape Ann Gillnetters Association represents most of the gillnetters in the community. The association represents 34 boats, with each boat averaging 2 to 3 crews. Of late, the primary concern of the organisation has been fighting the area restrictions imposed under the newly authorised Marine Mammal Protection Act (MMPA).

The Gloucester Fisheries Association represents land-based operations in the fisheries. It includes dealers and processors.

The Gloucester Inshore Fisheries Association represents the inshore (small mesh) draggers. There are 10 small draggers operating as day boats and they fish from March to November for whiting. The rest of the year they otter trawl for shrimp using a finfish excluder device known as the Nordmore grate. These small-scale fishermen operate a coop on Fishermen's Wharf.

B5. Adaptations and Adjustments to Crisis

Among the important questions regarding the future of groundfishing in Gloucester and throughout New England is the extent to which the fleet is reproducing itself. Are their sons and nephews replacing fishermen? Are they being displaced by new groups of immigrants based on alternative organisational structures? Is vertical integration within fisheries occurring, with the processing sector deploying its own fleets? These are questions concerning the future of the fleet and its ability to generate incomes that will be invested in Gloucester economy as they have in the past.

Unfortunately, we read in the youth of Gloucester a reluctance to enter the fishery. A key informant who taught high school in Gloucester for many years noted that, in 1974, a good 75% of those in biology classes had some ties to a fishing boat or the industry. Discussions of fishery biology and the industry were integrated into classroom lectures. In 1992–93 when he retired from classroom duty, virtually no students had ties (or admitted having ties) to the industry. Besides the decline in participation, there is now a certain shame factor associated with being in the fishery that can account for avoiding association with the industry by youth. This is due to a public perception in the media and at the managerial level that fishermen have destroyed the resources (they are “fish killers”), and that it is no longer an economically (or socially) viable manner of making a living.

Box 3. A Local Educator Explains the Loss of Economic Viability in the Fishery

“...when I first started to teach (1974) on Cape Ann it was not uncommon for students to pick up side jobs in on the wharf — literally putting themselves through college working on fish during the summer and after school. An awful lot also left school to work in the industry. It was an economic safety net. Now, those who did not return to school are hurting. Some of those kids really weren’t going to get an education and would take deck hand job. But lots of people did get an education working in fish. The really good kids could go through UMASS working in fish—packing fish—working two shifts. This has been lost—is gone. Back in 1974, one of the most positive things I could say to a kid was you can get a job (in the fishery) anywhere in town. Now the entire economic network provided by fishing is missing.”

Another indicator of the downturn in the fishery economy is the loss of dockside and processing work for students. Ten years ago, students could get double shifts at local processing plants, and there are numerous cases of students financing their college education with money made processing fish (*e.g.*, the present mayor of Gloucester did this). Other students less skilled in the classroom might end up dropping out and taking a job as deckhands. They could earn a lot of money this way, but curtailed their education thus limiting future job mobility. Now, all students are encouraged to stay in school because there are no jobs available for them in the local community outside of minimum wage opportunities. This has also hurt families lacking the resources to send academically gifted sons and daughters to college. Such youth no longer have the opportunity to earn college funding through fish processing.

Box 4. Local Resident Comments on the Decline in Support Business Infrastructure

Resident: We used to have clients of mine; they were engine-repair persons, who had a little company here in Gloucester, and they did extremely well and they provided good service to the industry. They are no longer in business; I mean they're gone. I think you have to go to Fairhaven and New Bedford to get somebody to come to Gloucester to repair engines.

Interviewer: And also the idea of parts and parts replacement. I mean...

Resident: Nobody's inventorying parts. You have to send to the manufacturer. I had a vessel that had a foreign engine in it. It needed a head, and the head had to come from Germany. I'm not gonna say to you that I can make a judgement as to whether the cost was greater; I think the engine was not as *good* as American-made engines. But I can *tell* you that a longer period of time was lost because of the transportation problem.

Interviewer: So in effect, another thing, not only the capacity or the response, I guess we'll call it the response capability of a fisherman at dockside when there's fish to be caught and the boat breaks down. That's a real issue when you have the lag time, and when there's lag time, people don't fish, they don't earn money?

Resident: There is definitely today a greater lag time surrounding most everything that's done shore-side that originates by some necessity for the vessel. Even to buy gear and equipment, you have to run to New Bedford now; it's not readily available. Westerbeak used to be here, that was a pretty comprehensive ship's chandlery outfit, and they're not here anymore; they're in Boston, I understand. In New Bedford if you buy in quantity, you can get better deals down in New Bedford. Repair persons, there is a repairman here in Gloucester who lives here in Gloucester, and he works for New Bedford or Fair Haven or in that area in a company. But everything you really have to do, for the most part, other than routine things, you have to go out of town to obtain it."

Infrastructures related to fishing have also faced a severe decline in recent years:

"There has been a real decline in the businesses dependent on the fishing industry—a wide number of fishermen, boat suppliers, boats and other processors—those really dependent on the business of the fleet—are hurting (at least the ones that are still in business)."

— Executive Director, Cape Ann Chamber of Commerce

Repair shops and equipment once regularly available now must be sought in New Bedford, Boston, or elsewhere. However, the Chamber of Commerce reports that, *overall*, the health of the business community in Gloucester outside the fishing sector is improving. This represents the shift from a primary economy dependent on fishing to a mixed economy of high tech, tourism, and light industry.

An important issue for management is the willingness of fishers to innovate in adapting to new regulations. As in Maine, where fishermen have moved into shrimp, scallops, urchins, and other fisheries, attempts have been made in Gloucester to innovate and change in response to Amendment No. 7 by shifting effort away from groundfish towards other under-utilised midwater and bottom species. For example, some druggers converted their gear for herring fishing in the hope of making it in this new fishery. Herring stocks are very abundant, but the market is undeveloped and current herring fishermen are uneasy about new entrants into a fishery they have long dominated. Nevertheless, Gloucester fishermen

have converted their vessels for herring at a cost of USD 135 000. However, they were unsuccessful at marketing the catch and had to give up and absorb the loss. Fishermen are also investigating other species, which are either under-utilised or have not been part of the traditional fisheries of Gloucester. For example, draggers are participating in a fishery for dogfish off of Cape May, and for squid off of Rhode Island. Others are increasing their fishing pressures on monkfish, whose livers are highly valued and investing in fish traps to harvest eels. Pessimism runs high, however, that any innovations can work. As one key informant responded: “No innovations are seen as adequate to save the community from Amendment No. 7.”

Overall, the ability to shift to other species and gear is limited by the capital investment in the fishing operation. The larger vessels characterising the Gloucester fleet is often saddled with debt, tied to home mortgages, and too specialised to rig with other gears without further debt. The financial ties of the crew to the vessel also limit it. A family (or families) that have their homes mortgaged to a vessel cannot easily abandon that vessel to pursue another option:

“Don’t forget, you build a fishing vessels, most of these guys have pledged their lives in the form of a mortgage on their real estate, their life savings, all are sunk into that vessel. And when they come home a broker—You know what I mean by a broker? They don’t make any money. When they don’t make any money, or, in fact, lose money—those obligations continue. If you don’t make your bank payments, and they have a lot of them that haven’t been making their bank payments, then desperation sets in.”

Despite these difficulties, willingness to adapt and innovate in is seen in the Gloucester Herring Corporation. This corporation consists of a group of processors and nine vessels. They are preparing to process food quality hearing for export in ice blocks. In order to break into the market, they would have to accept a price (USD .04/pound) below break even value (USD .06/pound). If they can create a demand for their product, the price should rise. The subsidy comes from a FIG grant.

Some lack of co-operation ensued in the start up. The processors proposed to let any vessel provide herring. This contradicted the original vessel owners’ understandings, causing six of fifteen original owners to sever ties with the corporation. Only nine vessels are still participating in the programme. Objections from the co-operating vessels have re-instituted the original accord. However, a key respondent estimated that to be successful, a total of 20 vessels would need to participate. Because of the breakdown in communication, it is hard to get boats to commit to ventures. Increasing competition and a pervasive lack of trust make co-operation difficult.

In addition to adjusting to change within commercial fishing, the prospect exists for fishermen to move into non-fishing occupations or marine related jobs either for short-term, casual employment during down turns in groundfishing or as a viable career alternative. Retraining centres established throughout the northeast, administered by state Departments of Labour, have been operating on the assumption that adjustment to the current crisis would include job training.

One way to measure this commitment is to examine the impact of the retraining centres, and the outcomes of retraining efforts and perceptions of professionals staffing the family practice centres. The necessity and response to retraining is an indicator of the health of a fishery community, and reveals social and cultural characteristics, conditions, and problems of those seeking assistance.

With 95 enrolled, the retraining programme has been as successful as possible in Gloucester due to strong leadership in the centre and the pairing of centre activities with the Gloucester Fishermen’s Wives Association (GFWA), but the programme suffers from several problems nevertheless. The GFWA is an organisation with 26 years working experience with the fishing community (see associations).

Despite the best efforts of the GFWA leadership in assisting the retraining process, there are still difficult problems to overcome. The major problem, of course, is that people do not want to give up fishing as a way of life, which does not compare with the job opportunities presented by the retraining centres.

The majority of fishers in Gloucester see little opportunity for them with retraining. Despite this, the Centre has enrolled 95 individuals in the programme, of whom 14 have new jobs. Of the remainder, 31 have completed training, 24 are in school, and the others in process. Many of these have been fishermen's wives. Despite this limited success, there are many problems identified by centre administrators in the design of the programme. Professionals from retraining centres in both Gloucester and on Cape Cod were interviewed on their experiences with retraining fishermen and their family members. Fishermen who came to retrain were faced with a variety of difficulties in coping with a change in lifestyle. Characteristics noted in counselling for retraining included:

- Independent natures of fishermen.
- Not able to work under another individual's direction.
- Difficulty in relating to support-service personnel who come with a different world-view.
- Linguistic and cultural barriers to retraining.
- Infighting between fishing groups (gear types) hinders group co-operation/
- Older fishers fear age discrimination.
- Unfamiliarity with set (clocked) schedules within a workplace.
- Older fishermen (40–45 years of age, averaging a fifth-grade education) do not want to participate in retraining—they see it as giving up, as losing face in front of their peers.

In an interview with a training centre director and counsellor from Hyannis, Massachusetts, fishermen were noted to communicate the following:

- They are very angry with the Government for their situations.
- They may lack trust or confidence that the retraining centres will not negatively affect them like the government has done with the proposed Amendment 7.
- They are very frustrated and under stress from not being able to provide for their families as they had done on the past.
- Older fishers express feeling that there is no hope for them getting a job and that they cannot be retrained for anything that fits their capabilities.
- They express an unwillingness to work for USD 8 to USD 10 an hour when they could earn so much more fishing in a short period of time.

Other characteristics noted among fishers coming in for retraining are a desire to work outdoors, a great interest in their local environment, and putting to use their electrical and mechanical skills.

In general, fishers' wives are more likely to come through and get retraining than fishermen themselves, often to give the household the means to maintain boats. Yet the overall feeling about the retraining centres are that the USD 30 million provided as assistance to the fishing industry by the Department of Commerce has not been used well, that there needs to be a mentor capacity for those coming into the community, and that many of the organisations are not culturally sensitive to the community needs. Because of these factors, future training programmes could use the help of NGOs who have worked closely with the communities.

B6. *Fishing, Public Perceptions and the Management Process*

Poor communication between fishermen and outside observers is a critical issue for fishing communities in New England. This can vary depending on the degree of representation that is perceived in the council. Unfortunately, outsiders "can include those not fishing in the community, the public media, and fishery managers." The definition of individuals as community insiders versus outsiders has ramifications on the effectiveness of the management process. This is not improved by the under-utilisation of community social and cultural information in decision making. Earlier social-cultural studies and recommendations on the groundfish fishery (Poggie and Pollnac 1979) have had no significant impact on the management process, even though this research identified some of the same problems facing fishing communities and management almost twenty years later.

Defining managers as outsiders has arisen from the lack of input everyday fishermen appear to have in the decision making process. Fishermen's associations prepared alternatives to specifics on the Amendment No. 5, yet they claim that their input was ignored. Others claim that when issues/problems in the fishery are brought to the attention of managers, the information is often turned against fishermen. A key respondents opinion is: "Information is taken and solutions imposed instead of developing a dialogue where fishers can collaborate to find solutions that are more effective biologically and better for community participants." These problems have led to a decline in participation in the public hearing process. There seem to be two basic concerns from the fishers perspective (1) lack of effective communication between managers and fishing communities, and (2) the perception that when information is effectively communicated, it is invariably used in a manner that is detrimental to those communicating it.

This can be seen in the degree of participation in Amendment No. 5 as opposed to Amendment No. 7. A key respondent said that during the Amendment No. 5 hearings, there was a great deal of active participation among fishing community members, including alternative plans that contained strong conservation recommendations. Yet, when Amendment No. 7 was discussed and passed, virtually no one attended the public hearings. Given the severity of cuts in fishing days proposed in Amendment No. 7, this is surprising until one considers the perception among fishermen that their inputs on Amendment No. 5 had been virtually ignored. Why repeat a futile experience? They perceived that no modification or compromise on the part of management indicated their views were ever seriously considered.

These behaviours are interpreted in the popular media as further indications that the MGF is dead or dying, interpretations, which have material consequences for those attempting to remain in the industry. Fishermen reported that banks are "getting out of the fishing business," not only refusing to extend new loans but calling in loans on fishermen's homes regardless of their past standing. Recall the similar comments of Portland fishermen, quoted above, whose traditional supermarket would not extend credit to another vessel.

B7. Understanding Community Dependence on Fishing

We have noted in several places in this report that dependence on groundfishing in Gloucester, as well as other ports, has both material and symbolic dimensions. Cultural and social distinctions divide fishing families from the rest of the community, making the fishing community, to some extent, insular. Ethnically, most ground fishermen are Sicilian/Italian, and there remain strong connections with Italian communities of origin. The fishing families are aligned to a local church and have been a largely closed population since the founding of the community in 1623. The Catholic parish was founded in 1849 and Catholic fishermen arrived shortly after. Protestant fishers declined in numbers over the 16th century while Roman Catholics now comprise the great majority. These indicators of social and cultural distinctiveness—of insularity—have made the fishing community less open to outside intervention in the form of government regulation than fishermen who are less distinct from non-fishermen, such as fishery biologists and managers. Thus religious as well as traditional values make the community more resistant to change than what would be designated the Yankee ports of the Cape (Chatham) and Maine. While fishermen are not encouraging their sons to enter the fishery, they resist leaving it themselves. Unfortunately, several developments external to and within the industry, noted above and below, have made staying in the industry difficult.

Issues of concern in the aftermath of Amendment No. 5 include the following need assessment from conversations with those working the docks, attending meetings, and coming to the Family Assistance Centre:

- Those who want to exit the fishing industry need support for their families while they are training.
- Wives who never worked need counselling and training. Many wives do have some business experience, however, in that the traditional norm was for many wives to manage the shore-side fishing accounts.
- Many wives need child-care assistance.
- Many need travel assistance to travel out of town for schooling or retraining.
- Because a large percentage do not speak English, ESL classes are needed which are offered at a time that is appropriate to their home schedules.
- Many need loans to stay in the business or to get into other types of fishing.
- Many need assistance and training in reorganising their businesses and preparing business plans.
- Many need assistance and training in grant writing.
- Many need assistance in finding immediate employment.
- Many of those who work as deck-hands are severely under-employed and are experiencing cuts in their income as fishing trips decrease and deck hand shares paid by boat owners shrink to cover the increasing costs of vessel operation.

- Many need legal assistance for loans, bankruptcy, home protection, Homestead Act, licenses, permits, relocation, violation negotiations, vessel insurance, interpreting regulations, other.
- Many have no medical insurance, or drop their insurance as they try to cut vessel-operating costs.
- Many are unable to leave the fishing industry because they have fishing vessels with big mortgages and cannot leave them tied to the dock inactive.
- There are widespread psychosocial impacts in the fishing sector among fishers and their families. They need assistance in dealing with the high degree of uncertainty and stress created by the changes in regulations and by the perceived lack of communication with those making the changes.
- Many are unable to attend meetings to keep up with rapidly changing and unexpected fishing regulations, having difficulty predicting how regulations will affect their current and future fishing strategies.

The decline in the economic viability of the larger fishing vessels has put incredible pressure on the ability of fishermen to make a living. The lack of security from fishing has steadily increased as the management regime becomes more restrictive, fish of certain target species are scarcer, and operating costs continue to rise. One outcome of this has been reduction in crew size to reduce labour costs. There has been a drop in the number of crew employed on the vessels from a high of 10–11 to now just 2–6. Some larger vessels are now operating inshore with skeleton crews of just two to four (*e.g.*, a father-son operation). They cannot afford to work with a larger crew, nor can they afford to fish offshore for any extended periods.

Only 23 vessels over 70 feet, which used to work Georges Bank are now fishing in the Gulf of Maine. This has increased the individual crewmembers' burdens of watch time and other activities while decreasing available employment in the fishery. Thus, the fishery is experiencing an ongoing decrease in the social yield of the fishery, or the number of individuals that find employment and income in the fishery on a sustained basis.

Reduction in crew size is accompanied by longer trips at sea (10–12 days) compared with 7–8 days several years ago, increasing the work load and stress on remaining crew. It also makes it much more difficult to find good crew for vessels that are short handed. Reduced crew means there is also less manpower to deal with emergencies at sea. This puts the remaining crew at greater risk. The loss of days at sea which accompanies putting into port in bad weather pressures captains to stay out even during threatening weather, putting the vessel at greater risk.

Deckhands have arguably borne the brunt of reduced crew sizes. Traditionally, the share that goes to the boat is half of the catch profit. To make up for smaller catch and less profit, the boat share is increased. This cuts into the profit shares of crew. Crewmen aboard larger vessels in Gloucester and New Bedford are more like factory workers than independent fishermen in small vessels who own their own means of production.

Having little control over the means of production, and being devalued as costs of fishing increase, has a severe impact on deckhands. They are already at the lower end of the job satisfaction scale (Poggie and Pollnac 1980). As they further marginalised, relationships with captain/owners become strained. Deckhands have no control over the production process, but in fact are earning less and less as

the captain/owners they work for put more and more of the catch share into covering the operating expenses of the boat. One estimate of a deckhand's earnings was that his USD 300 share for a recent trip, considering days at sea are 24-hour full time activities, amounted to USD .40/hour.

Based on US census data, the annual medium family income for Gloucester is USD 32 690, for non-family, USD 17 258, and *per capita* USD 16 044. Data from the Doeringer, et al study of 1986 suggested that captains and crew were making incomes higher or comparable to this over ten years ago (USD 30 000 to USD 35 000 for crew and USD 50 000 to USD 55 000 for captains) and the amounts spent by offshore vessels to cover trip expenses suggest that, even in decline, the fleet continues to generate substantial incomes for the port of Gloucester.

Table 10 documents the contrast in expense between vessels of different sizes. As vessels size increases, there is a considerable increase in operating expenditures, such that the average total expenditures for a larger vessel operating with a normal complement of five crew is approximately six times that of the smaller day boats. Increased costs come from greater number of days at sea, which translates into higher labour, fuel, ice, and food expenditures. Risk is thus considerable greater for larger than smaller vessels. If a vessel comes in with a "broker" (makes no money) then the subsequent economic loss is also greater. Reduction in days at sea thus puts the greatest pressure on the largest boats, for fewer total trips makes it more difficult to cover expenses for the higher relative costs (in comparison to smaller vessels) of trips that are "brokers."

Table 10. Average Annual Expenditures for the Gloucester Fleet, 1994 Dollars

Average bill -dollars spent in the City of Gloucester	Small (day) boats (0–49 feet)	Medium boats (50–69 feet)	Large boats (over 70 feet)
Fuel	USD 12 000	USD 60 000	USD 120 000
Ice	USD 2 000	USD 9 000	USD 22 000
Food	USD 4 000	USD 11 000	USD 15 000
Gear purchases	USD 4 000	USD 20 000	USD 37 000
Repairs	USD 2 000	USD 20 000	USD 61 000
Bookkeeping	USD 2 000	USD 2 000	USD 2 000
Payroll	USD 40 000 (2 crew)	USD 25 000 (3 crew)	USD 150 000 (5 crew)
Average Yearly Total	USD 66 000	USD 147 000	USD 407 000

Source: City of Gloucester, compiled by Gloucester Fishermen's Wives Association.

Commercial fishermen in Gloucester have developed Fishermen's family log books and decades of fishing experience provide them with a sound basis for tracking changing conditions of the fishing grounds and stocks. For example, one fishermen perceived that besides overfishing, the scarcity of certain fish stocks could be related to changes in the water temperature in traditional fishing:

"The fish have been moving north and east away from us as the water temperatures have increased. Ten years ago I couldn't put my hand in the water that washed up on deck without it freezing up from the cold. Today, I can get my hand wet and it doesn't even bother me. The bay in the harbour always iced up in the winter time, but it hasn't done this for about seven years."

Box 5. A Commercial Fisherman on Logbooks

“I have a friend who ran a day boat; used to go off of Boston to fish. But now it is all polluted. To bring the fish back you must take the poison out of the water. If accurate data had been made available to the Feds 20 years ago, the books—log books on where the fish are, where to go to catch fish how far to set the nets, the book that went from generation to generation, book updated every year—if you ever tried to break into the business and didn’t have access to this information, you would not make it fishing.”

Folk knowledge of fishing in Gloucester is based on hundreds if not thousands of collective man years of fishing. The use of this folk knowledge is critical to fishing success. Many fishermen try to implement practices that are conservation oriented. This does not mean that there are others who ignore conservation practices. Fishing in restricted areas, using net liners, and fishing out of season are not unknown. The increase in severity of fines is partly a reflection of the need for strong enforcement.

The Gloucester fishing community has consistently supported a variety of measures to conserve stocks. Their role has not been recognised by the public. Recent specific issues and actions expressed by key respondents include:

- The fishing community, itself, has proposed a conservation plan for the MGF but this went unrecognised in the Amendment 5 and 7 hearings.
- Some stocks are being depleted; but there may be larger stocks of other fish. Markets need to be developed for these so-called under-utilised species through fishers and processors working together.
- This community needs help to accomplish development of new markets.
- Fishermen felt they are not being heard or taken seriously. This point has made numerous times; but what is the case is there is an imbalance of interests regarding fish and people and how the industry is seen.
- Fishermen express deep concern over the wasting of fish due to trip quotas on certain species, such as the 500-pound/trip limit on haddock.

In “A City of Gloucester’s Fishery Management Plan” (1995), we have an example of a folk management alternative. Within this plan are specific measures that contradict the stereotype of fishers and fishing communities as being primarily motivated by greed. For example, the following conservation measures are part of the city plan:

- Opposition to pair trawling on groundfish to allow for stock recovery.
- Proposal to study roller gear to determine a height limit of rollers to protect specific rocky ground areas.
- Vessels to give up three 20 day periods a year to reduce days at sea to occur between the peak groundfish spawning periods.
- Hook vessels with more than 4 500 hooks should be bound by the three 20-day programme.

- Support of the six-inch mesh size throughout the range of the Council’s jurisdiction, not just in restricted areas such as marine sanctuaries.
- Gradual withdrawals of fishermen from the haddock fisheries until such time that stock increases occur.

B8. *Changes in Social Conditions in the Fishing Community*

Scarcity of fish, gentrification of the community, and recent regulations are resulting in significant changes in the social conditions for the fishing households and families in Gloucester. These changes are seen both on and off the water, in the household environment, and in the social and occupational networks of the community.

On the water, there is an increase in competition and loss of economic viability, particularly for the larger vessels and their crew. One symptom of this is the breakdown of shared information on the location of fishing grounds, expressed as “chatter” (on-the-water conversation by marine radio). Chatter allows a fisher to share information on the location of good fishing strikes with others, with the hope of benefiting by reciprocal exchange of information in the future (Poggie and Pollnac 1980).

Breakdown in chatter has been attributed in part to the fishing block (days at sea) regulations:

“People don’t talk to each other anymore on the water. Everyone is so frustrated and afraid. Nobody is helping anybody out on the water anymore. This is because the days at sea programme. If I have to come in, and you go out on your block, then if you know where I was fishing, you’ll get my fish. So everyone is keeping to themselves.”

—Community Leader, Local Fishing Association

One possible outcome is that overall landings could be decreased even more by the lack of information sharing. As individual boats don’t report concentrations of fish to others, the overall landing figures may decline, giving the impression based on landings that in comparison to previous yearly catch statistics scarce fish resources seem to be even scarcer than they really are. Thus, breakdowns in communication between fishers on the water has caused an image of stocks depressed further than they may be, as fishermen who find fish do not pass this information along to other fishermen. A consequence is an increase in “brokers.” A broker is a fishing trip in which little or no fish is caught and the outcome is a loss in revenue to the boat, captain and crew.

Mistrust among fishermen is exacerbated as conflicts occur between gear types. In Gloucester, fishermen report that gear conflicts increased in intensity about ten years ago. Up until then, there were few gillnetters and longliners fishing out of Gloucester. Since WW II, mid-water and bottom dragging was the primary fishing technology. With rock hoppers and other technological modifications, draggers were able to get into grounds where they were previously excluded. Hard bottom is prime fishing area for gillnetting and longlining, because fish tend to aggregate over these food rich areas. Conflicts arose as draggers, gillnetters and longliners all competed for the same hard-bottom fishing areas. Part of this stemmed from the interaction between relative newcomers to the fishery and those who had come just before WW II.

The competition between the two groups also lead to different perspectives on conservation. It was claimed that older established fishermen were more concerned with conservation issues than newcomers who were seen as going all out to catch as many fish as possible, including the use of illegal

net liners to increase the overall catch at the expense of smaller fish and other non-targeted by-catch species. This stereotyping aside there was some conflict between the newer fishing families and established families. This led to conflict, and was exacerbated by a perception of lack of representation of all groups of fishers on the New England Fishery Management Council.

The primary complaint by key respondents is that council members don't understand the impact of the regulations they create, and this creates confusion and resentment in the fishing community. This resentment can lead to non-compliance with regulations that are seen as unfair. This has not substantially changed since the 1980s (Poggie and Pollnac 1980). If anything, competition within the community has got worse and divisions between gear groups exacerbated, by the present system.

"Amendment No. 5 is turning us all in to criminals," said one key respondent, commenting on the pressures of conforming to livelihood threatening management measures. Related to perceptions such as this is the perception that the fishing collapse is their fault, an image promulgated in part by the popular media that portrays today's commercial fishermen as greedy "fish killers" and primarily responsible for fish scarcity. A presumption of criminality follows, suggesting that all fishers are guilty, by association, of overfishing.

Box 6. Two Views on Gear Conflict between Gillnetters, Longliners, and Trawlers

I. "So in the early 80s, with the new technology, the draggers went in fishing ground that never before they were able to go, which is like the hard bottom. But as more gillnetters and longliners came along— which is the other group of fishermen that have spurred(?) within the last 15 years, then we start having the gear conflict problem. Because gillnetters and longliners, they set their gear in hard bottom, so when draggers drag there, they find that all this bottom has been taken. And both methods, gillnets and longlines, has really become a permanent structure at the bottom of the ocean, because they hardly ever get totally removed; they're always, always there The draggers really believe that gillnets are one of the major problems, because there are ghost nets that get left out in the ocean, and they fish forever... When a dragger just drags and goes away, and somebody else comes along and can use the bottom floor. And so what has happened now in the last couple of years has been really a problem with that, but also it's my belief that it's just an excuse that they've found to really take ownership of the ocean, so the draggers always get accused of cutting gear."

II. I mean, they should figure out what the hell's wrong here, and they should say, "It is large-scale mobile gear tearing up the bottom," and "Are they negatively impacting the food chain at its source?" You know, no cover for the juveniles and increased predation and disrupting the spawn spats and all this other stuff that's being talked about. And when you look at it, that's 75% or 80% of the industry right there. It's the predominant harvesting technique, and it might not be the best mousetrap there is. I mean, it might be too good. We're running out of fish obviously. But instead of addressing any of these questions, instead of putting down a long-term goal to let's work towards sustainability over the next 20 years. If we find that this thing stinks, let's start to phase this out and put incentives in to get into cleaner fisheries and put incentives in to devise new techniques that take into consideration some of these issues, which may be counter-productive and detrimental to the entire chain of species which we're working on."

Part of the regulatory response to overfishing and scarcity has been the use of the call-in system. This is a means to track vessels as they leave and return to port. Interviewed fishermen expressed that this, too, made them feel like criminals, commonly likening the system to "big brother" watching them: "*When I come home from fishing, I can't kiss my wife until after I kiss the telephone*" [calling NMFS].

As fishing becomes more difficult, there is an associated decline in job satisfaction, which may lead to mental health problems. The Department of Health, Education and Welfare (now Health and

Human Services) noted in a 1973 summary of research by the Survey Research Centre at the University of Michigan that the absence of job satisfaction is related to psychosomatic illnesses, anxiety, low self esteem, worry, tension, and impaired interpersonal relationships. Increased stress due to the crisis was noted by every key respondent interviewed in Gloucester, and resulted in occasional emotional expressions of stress during the interview. Stress has been attributed by key respondents to strong sentiments of uncertainty and helplessness, particularly since Amendment No. 5. Other notable impacts include domestic strife, violence, and avoidance behaviour:

“We used to go out to the club and to go to church, but I don’t do that anymore. What is the point? There is nothing good to talk about. We just go from the boat to the house. Sometimes we go to church, but its usually only on Easter or other holidays.”

As fishers and their families withdraw from each other, you would anticipate a breakdown of the social networks they participate in. Social networks are partly represented by community associations. For example, the Sons of Italy are an association comprised almost entirely of fishers and their families. One way to measure this breakdown is in the level of participation in associations. The following table shows the number of registered members in four community associations in Gloucester over the last six years. The Moose and Elks associations are not composed of fisher families, but rather represent sub-populations involved in tourism, local light industry and the bedroom community sector. They have increased or remained stable for the shown period. By contrast, the Sons of Italy and Societa Siciliana shows a dramatic decline in membership, from a high in 1991 of 304 to a low of 89 (a 70% decline) for Sons of Italy and from 200 (1991) to 79 (1995) (a 60% decline).

Table 11. Changes in Membership of Fishing/Non-fishing-related Community Organisations—Membership in Community Organisations

Year	Ladies Order of Moose	Gloucester Elks	Sons of Italy***	Societa Siciliana***
1991	226	76	330	200
1992	227	74	260	175
1993	228	88	180	100
1994	229	287	130	90
1995	232	174	110	79
1996*	233	185	84	**

* To date.

** Not yet compiled

*** Most all are fishers/fishers wives.

Source: 1996 Community Organisation Survey.

Gelles (1974) and Strauss (1979) report a clear relationship between job satisfaction, family violence, and other social problems. An MD in Gloucester with decades of history treating local fisher families, processors, and managers noted a dramatic increase in stress-related illness and disease over the last three years. This includes gastrointestinal illnesses, stroke, heart attacks, and hypertension. He attributed this directly to the impact of Amendment No. 5 and related changes. Heart disease and other illnesses which impact a persons social relationships have also been related to work dissatisfaction (HEW 1973):

“One fisherman came into the office and was all shook up because he had to throw away a lot of haddock. He went out fishing and caught 2 000 pounds of haddock in his first tow. He had to throw 1 500 pounds overboard. So he moved his boat and reset the net. He got 10 000 pounds, and all of it went overboard. So he moved his boat again, and this time he got 20 000 pounds. Well, for these fishermen, waste is a sin. So to throw all these fish overboard was really hard. This guy was so upset about it when he came in that he started having chest pains right in the office while he was talking about it.”

—President, Local Fishing Association

A major source of conflict also comes from the decrease in catch share payments made to crewmen on draggers. As the costs of fuel and other operating expenses has increased, and allowable days at sea decreased, captain/owners are partly trying to make do by decreasing the pay of deck-hands. This has put tremendous stress on deckhands, who as a group are the most poorly educated and least occupationally flexible population in Gloucester.

Local newspaper reports on boat buy-backs, the collapse of the groundfish stock, and other related issues have created several problems for fishermen, both material and psychological in nature. By taking management agency actions and refitting them into “the industry is dead,” it provides no room for recovery and creates a community environment that disfavours those struggling to adapt to the changing fishery environment.

Box 7. A Community Leader Comments on Shifting Attitudes to Fishing and Fishers

In response to the question: “Do you see a shift in the way people (in the community) think about fishermen and fishing in general,” a community leader responds:

“Gloucester is going through a gradual conversion from a self-sustaining community to a bedroom community... as a consequence of those people (fishers) who’ve been migrating out of the city, there’s a tendency not to understand the way the fishing industry is run. And I’ll never forget the time I was standing on the wharf when I heard a man say to a fisherman on the deck of the boat; can I have a haddock? And the guy said, ‘I can’t give it to you because I need it to make the box’. And the person misunderstood what he said and he said, ‘I didn’t want it for nothing; I’d have paid for it’. And the guy said, ‘No, no. I need it to make the box’. Well, he was speaking broken language, and the man didn’t understand him. I did, and I heard the man turn around and say to the person he was with, ‘Jesus! Can you imagine that? And they get the (fish) for nothing.’

I was flabbergasted. I was flabbergasted. So the *perception*, the perception is changing, because it’s no longer predicated upon the basic historical understanding that’s ingrained in anybody that grows up in this community. It’s now being clouded by ignorance, by even educated people, who simply don’t understand the industry.”

This is exacerbated by the ongoing process of gentrification, a process commonplace in many contemporary coastal communities (Gale 1992). The composition of the community is changing as more non-fishers move into the community. This creates a change in the way the industry is understood, and is a source of conflict between new interests in development and transformation and old interests in fishing tradition and sustainability.

A public official pointed out that there are now four major components to the Gloucester economy, and that they are all important to maintaining the economic health and social character of the community. These are fishing, tourism, light industry, and folk art. In fact, the largest single employer in

the community is Varian Ion Implant Systems, headquartered in Palo Alto, California, which supports 1 400 jobs in Gloucester. However, Varian has just gone through two layoffs, and may eventually be reduced to 450 employees.

Light industry is not as intimately linked to fishing as are tourism and the art colony. The fact that Gloucester remains a working fishing port is part of what attracts both artist and tourists to the community: “...*there’s really serious interrelationships between the fishing industry and those other components that makes the whole thing tick. ...If you go to a community like Salem, which is a fine community, don’t get me wrong. You go there to see maritime heritage in the past. They come here, tourists, to visit, and you see it still alive; it’s a way of life to be witnessed... the heritage and interrelationships between the two are quite substantial.*”

B9. Conclusions

The groundfishing fishers and families of Gloucester are experiencing a great deal of stress and economic hardship due to recent and proposed regulation on the fishery. Increased competition and conflict, loss of days at sea, and increasing operating costs are all contributing to the crisis. Large-scale draggers are having the most difficult time, and deckhands on these draggers are the most vulnerable to the decreasing economic and social viability of the fishery. Gillnetters and longliners are also suffering from new marine mammal regulations, which curtail the areas they can fish. In comparison to Portland, the present and potential loss of social capital in Gloucester is greater, and the flexibility to respond to severe cuts in days at sea is more limited.

Through organisations such as the Gloucester Fishermen’s Wives, concerted efforts are being made to constructively adapt to the fishing crisis presented by Amendments No.5 and No.7. Representatives of the fishing community are writing grants for federal assistance, promoting under-utilised species, and working with state and regional religious, service and state organisations to diversify the options available to those in the fishing industry.

As of yet, attempts to adapt to the new regulatory climate have been difficult, but should improve with time if resources are made available. Switching to under-utilised species such as herring carries high costs, and the difficulties of breaking into new markets also limit the success of this venture. The proposed introduction of a local fish auction is a positive development, and new initiatives to buy back vessels could somewhat alleviate the situation. However, the overall assessment is that many fisher households are at or near social and economic collapse. Efforts are being made and could be supported by management, which diversify the fishery through retraining programmes, co-management of resources, and other initiatives to mitigate the crisis situation of this population.

C. Chatham, Massachusetts

C1. Overview of Chatham Groundfishing

Situated on Cape Cod, between Gloucester and New Bedford, Chatham’s fishing fleet represents, most likely, the future of fisheries that are able to remain viable in a setting of increasing coastal gentrification and development of the coast for recreational purposes. It is, by most accounts, a fleet comprised of smaller vessels than those in New Bedford, Gloucester, or Portland; its fishermen use a wider range of fishing gears than those in the smaller ports, with fewer relying on dragger nets and more relying on gillnets, longlines, hand lines, and traps. This suggests Chatham is a less specialised fleet than the large

ports to the north and south. Chatham fishermen, in fact, view the larger fishermen with some disdain, seeing them as primarily responsible for the current crisis in the fisheries.

By contrast, within Chatham, fishermen expressed far less competition than what we have witnessed in New Bedford and Gloucester. During our focus group in Chatham, when the issue of conflict arose, we elicited the following:

“We fish with our monk gear right in with the lobster gear most of the time, so for the most part we get along. But there are two or three guys we can’t get along with. But for the most part, we do. And the draggers aren’t towing in where we are, because the lobster scares their fishing. But a scalloper will come through and decide there’s some monkfish and set a few traps. But other than that, with Chatham—at least where I am—there’s a little bit of co-operation.”

Another fishermen added, “If there’s a problem between the Chatham fishermen, I don’t think it’s when they’re fishing; I think the biggest problem with Chatham is that the different gear types don’t get together and take on the mobile gear.... And the mobile gears, they hate other, they pay somebody to represent them, and they speak with one voice to the Council and to Congress and to the state. But Chatham speaks with a bunch of little voices.”

The competition that does exist in Chatham occurs around gillnetting, which was reported to have increased in the past few years and is not considered, by fishermen using other gears, one of the more damaging gears in the fishery.

Fishing in Chatham, in any case, occupies an economic niche within a larger economy based primarily on tourism and seasonal residence. Chatham is a seasonal community, quite wealthy, with many summerhouses and seasonal tourist cottages and businesses that open only during the summer. In years past, the seasonal fluctuations in the town’s population were more pronounced, but today more shops and stores remain open through the year. These provide the bulk of the employment in Chatham, along with service and construction personnel who staff the motels, bed-and-breakfasts, and cottages during summer and, usually through the late winter and spring, repair or make ready for residence the seasonal homes. Summer remains, of course, the busy season for both fishermen in Chatham and those involved in the tourist industry.

Chatham’s attraction as a tourist destination derives in part from its prominent location at the elbow of Cape Cod and in part from its maintenance of New England charm. Most houses are sided with the conventional streaked grey wooden shingles and many are surrounded by stone walls of the kind Robert Frost claimed made good neighbours. The long-running television programme, *Murder She Wrote*, set in a charming New England coastal community, could as easily have been filmed in Chatham.

Reference to literature and television are not merely helpful in describing Chatham, they suggest that the town has tried hard to convey a somewhat removed, romanticised feeling, a fantasy that has little room for the industrial clutter of a fishing fleet like Gloucester’s or New Bedford’s. An obviously industrial fleet deters tourism unless it remains confined to out-of-the-way harbours that have not yet been zoned for condominium development.

The aesthetic incompatibility between large vessels requiring mammoth processing operation and quaint shorelines for shell collecting and sunbathing accounts for the current character of the Chatham fishing fleet. This incompatibility accounts as well for the downplaying of the fishing crisis in Gloucester by individuals with vested interests in tourism and the marginalised locations of commercial fishing in Ocean City, Maryland or Cape May, New Jersey.

Chatham's fleet seems to have grown up with the community's emphasis on tourism, however, much in the same way the Maine Lobster fleets have, in general, grown up with recreational sectors of some of the communities between Portland and Portsmouth, New Hampshire. Evidence of how well integrated the recreational and commercial sectors are in Chatham was reflected in an interview with a marina owner there. When asked whether or not the government knew how extensive the support sector was, he responded:

"I don't think they know how extensive it is; I know they don't know how extensive it is, I've always told people: the fishing fleet ends up on Main Street, because without it—for one thing, the tourists still come to see the fishermen unload their catch, and then they go up to Main Street to buy their sweaters and hats. They don't think about that. This town is solely geared for that fishing fleet, and that's what brings tourists, that and nostalgia is overlooked, as well as the support group, the baiters and the related businesses in town."

This individual believes that the commercial fishing industry is more than a merely quaint appendage to an otherwise seasonal vacation spot, but central to Chatham's character and charm.

C2. Port Infrastructure

Chatham's fishermen depart from a municipal pier and from a few sheltered harbours around town, mooring their vessels to poles in the shallows in the same way lobster boats add a picturesque dimension to nearly all ports of coastal Maine. Although the Chatham commercial vessel list lists 291 commercial fishing vessels, reports of active, full-time fishermen we interviewed suggested that only between 75 and 85 full-time fishing vessels fish out of Chatham, with most of them in the small to medium range, measuring between 30' and 50' (9 to 15 metres) in length. Thus, many of those licensed as commercial fishing on a casual or part-time basis. Two recent in-depth studies in North Carolina (Griffith 1996; Johnson and Orbach 1996) found that only around one in every four commercially licensed vessels were operated by full time fishermen. Generally, those vessels under 25' (7.6 metres) are not engaged in commercial fishing, and most vessels listed on the Chatham list are between 13' and 20' (4 and 6 metres) in length. Those longer than 25' were reported to fall into the following categories.

Table 12. Fishing Vessels of Chatham, Massachusetts by Type of Fishing

Fishing Type	Number	Percent	Length
Gillnet	21	25%	35' to 48'
Longline	21	25%	25' to 44'
Dragger	5	06%	38' to 45'
Other	37	44%	26' to 38'
Total	84	100%	25' to 48'

Obviously, dragging—the principal gear of the specialised groundfishermen—is far less common than gillnetting and longlining in Chatham. This is due not only to the physical and social characteristics of the port, but also to market factors. Chatham fishermen claimed that they fish for a quality product, selling primarily fresh fish that is, of course, in high demand among the tourists and seasonal residents.

Longlines, they claim, are least damaging to fish, and gillnets less damaging than draggers; daily fishing, too, contributes to the emphasis on quality that has developed here, since fish are landed within hours instead of days of being caught.

Gillnet vessels tend to be somewhat larger, on average, than longline vessels, with the majority of the latter falling in the 30' to 40' (9 to 12 metres) range and the majority of the former longer than forty feet. Other vessels included those that specialised in tuna fishing, a handful of lobster/trap vessels, and three that fished with hooks but not longlines. These tend to be smaller, with most of them under 30' (9 metres) in length.

Chatham fishermen, in part because of the smaller size of their vessels, tend to be more constrained by weather and seasonal considerations than the larger fleets of Gloucester, New Bedford, and Portland. Many of them take most of the winter off, concentrating their efforts during the summer and fishing intermittently through the spring and fall. Some reported that the 88 days at sea regulation would have little impact on Chatham fishermen because during a typical year they fished no more than 100 to 150 days anyway. Some expressed the belief, in any case, that the 88 days at sea would add up to 176 12-hour fishing periods, which, taking primarily day trips, is about as much as they fish during the course of a typical year.

Vessel size in Chatham also influences their range: most do not have the fuel capacity to fish further than fifty miles off shore, and most fish either in state waters or within twenty to thirty miles of shore. Chatham fishers also deviate from fishers in the ports dominated by larger vessels in that they tend to move among different fisheries and different gears through the course of their lives and over the course of a single year. Typically, they combine winter shellfishing (scalloping or clamming) with summer groundfishing; according to several informants, they complete with many of the part-time and casual commercial fishermen who depend on shellfishing—particularly clamming—to supplement annual earned and unearned incomes.

A couple we interviewed exemplify the practice of moving among fishing, non-fishing employment, and fisheries-related work through the course of their lives, a common occurrence among fishers like those in Chatham:

Karen and Allen McPherson (not their real names) make most of their earned income by supplying bait to between eight and ten longliners who fish out of Chatham. Obviously strongly attached to the lifestyle of a coastal community, Karen and Allen also shellfish during the winter, something Karen learned from her father when she was a young girl. The bait supply business, like most businesses in Chatham, is busiest during the summer months. Karen and Allen hire four additional employees during these months, not only because of increased longlining activity but also because Allen sets eel pots during the summer and fishes for dogfish.

When asked about whether or not the current crisis would force them to move from Chatham, Allen answered, "No, no. It would take a little bit more than that to push us out. I've done a lot of different things in my life, so it's not like I couldn't switch jobs. I've been in the siding business and I've built houses for numerous and numerous years. I don't want to have to do it again, but we always have that option."

Allen's construction background, of course, is common among fishermen and construction is one of the common industries into which fishermen move during off-season of times when fishing is poor. In Chatham, a construction background is doubly important because the winter and spring months are heavy demand months for construction skills. Yet Karen and Allen have onto confined their options to fishing, bait supply, and construction. Allen was one of the few we interviewed who expressed some interest in an

aquaculture, perhaps because of his familiarity with eels. Eels have been receiving a great deal of attention in New England as a good candidate for aquaculture. Along with urchins, eels have attracted so many fishermen in Maine that crowding has begun to occur.

C3. *Fishing Organisations and Associations*

Interviews with Chatham fishermen revealed that the formal organisations representing them include the Cape Cod Fisherman's Association, the Shellfishermen's Association, and the Massachusetts Lobsterman's Association, but none of the individuals we spoke with expressed a great deal of enthusiasm about any organised political or lobbying activity to emerge from the Cape. Principal regulatory concerns among Chatham fishermen were that ITQ and TAC would devastate their fisheries. Several quotes were similar to the following regarding these two regulatory mechanisms:

“ITQ would demolish me. From talking to the man from Alaska who was highliner—he came down to Chatham to talk to us [about ITQ], and I talked to him for quite awhile afterwards—and from talking to him, if ITQs come, I'm out of the business.... Because I'll probably have such a small quota allotted to me. Because, see, the ITQs will be directed towards boats like those really big draggers, like the ones that show the best year and use the best technology first. It rewards the guys who caught all the fish initially. They'll be given a small amount of fish to catch; and I'll be given a very, very small amount of fish to catch, and I'll end up selling my ITQ to probably a company or something like that.”

In terms of conflict and co-operation among fishermen in Chatham, they portrayed relations within the town's fishing community and among similar towns along Cape Cod, as more co-operative and more agreeable towards one another than towards fishers from other, more industrialised ports. This facade of co-operation conceals one source of conflict within Chatham, however: that which occurs between hook/longline fishermen and gillnetters.

Gillnets were introduced into Chatham in 1978. The innovation diffused through the community relatively swiftly, yet obviously not all of the fishermen converted to gillnets. We interviewed the men who claimed to have been among the first to use gillnets in Chatham, and he justified their use as response to growing competition from draggers based in the industrial ports:

“The way I analyse it, is that at the same time were upgrading technologically—if you want to think of it that way, a pretty good way to think of it—because at the same time were switching over to gillnetting, the draggers were also making a huge movement. So we weren't even getting ahead, although it looked pretty good for four or five years. We were just really sort of—I call it 'joining the 20th century,' because the way we'd been before, for better or worse, was very much a pre-industrial outlook on fishing.”

Despite the competitive edge gillnetting may have given some Chatham fishers, others object to its use, making statements like:

“The gillnetters are farming. You know what it's like—they set the gear and they own the spot. The Channel and back in the inshore grounds, all traditional hook spots have been taken over by the gillnetters. They don't fish here in the Winter because the fish are small, and also they make so much money in the Summer that they don't have to fish in the Winter, the majority of them. But they really take over the grounds; they've got nets on every wreck. They're all good fishermen, but the loran makes them a good fisherman, for one thing. If you went back to the old days and used your wristwatch, half the guys wouldn't be able to find their way home. But the gillnets really are a major problem.”

As a reflection of the difference between Chatham fishers' relations with each other and Chatham fisher's relations with fishers from other ports, a much more frequently mentioned and vociferously opposed fishing practice than gillnets has been dragging that damages the bottom, particularly the use of "rock-hoppers," or nets outfitted to roll across rocky bottoms by means of thick cables and wheels. The opposition to this gear emerged, usually, in the context of responses to questions about changes in the resource.

Commonly, in-shore fishermen are particularly sensitive to the conditions of substrates and their effects on fish populations. This is due, to the ease with which in-shore fishermen can feel changes in the bottom in shallower water, either directly with poles and other gears or indirectly by encountering snags or recognising changes in water colour or surface texture. Fishermen in North Carolina's sounds or the Chesapeake Bay, fishing in shallow water environments, tend to cite changes in substrates frequently in their ethnobiological assessments of resource conditions (Griffith 1996, 1994; Lawson 1988). Exemplary complaints against rock-hoppers read as follows:

"A lot of the gillnetters will complain about the hookers and say they catch all little fish, but that's all that's left. When the gillnet is really fishing and they've got it working well and the fish are chasing bait and they're chasing bait at night, they catch them. I mean, when they catch them, they catch them. They nail them, they annihilate them, which is something you just can't do. And the next big change that came around here that was a tremendous was rock-hopper gear. They guys would drag their rock-hopper gear.... They are rubber, about this big, and they can bounce over the rocks. Before the draggers stayed on the soft bottom; they could catch enough fish in the soft bottom, there was enough fish around. And we've seen the draggers out there and I'm over here on the hard bottom, and the guys would be gillnetting and jigging on the hard bottom—and the gillnetters would be out in the hard spot. But then all of sudden, a couple of guys came up with this hard-bottom gear...But the thing about it was, first the rock-hopper gear worked fairly well so we had to compete wit them momentarily, but they'd still hang up. But then [the late-1980s] things were still surviving and still plentiful. Everything was still relatively prosperous."

"They got this giant net that ... stretches as far as Gray Hill. I'm thinking, 'Oh, my God. This can't be true.' But it was true. They went up to George's Bank to the *spawning* grounds in the wintertime and caught. So we were fishing one February, '87 or '89—I can't remember when, and the fish didn't show up. And I was talking to a fellow by the name of McMellon and I said 'The fish didn't show up' and he said, 'They caught them at the pass'. Those guys *nailed* them, so that was a big change, because there was still a lot fish in the winter. But these guys really nailed them.... They were wiping them out. And you better remember that there are just a few guys getting really rich, and you're getting rid of the guys like me, because I'm getting squeezed out of the fishing, you understand what I'm saying?"

Summarising the political activity and organisational practices of Chatham fishermen requires few words. There are not powerful organisations emerging to challenge Amendment 7 and relatively little interest or participation in organised political activity.

C4. Conclusions

Community concern over Amendment 7, gear conflicts, and reduced stocks weigh on the fishers of Chatham. Although not as visibly under duress as fishers in Gloucester, they are worried about the future of the fisheries, but have not developed a political organisation to voice three concerns. Lack of organisations stems from a strong spirit of individualism in the fisher population. Conflict with draggers from other ports and restrictions on fishing areas and days at sea are shared concerns in the Chatham fleet.

However, an advantage of the Chatham fishers is their lower capital costs (no large draggers and crews) and the ability to switch between different stocks, including shellfishing, on a cyclic basis. A most telling sign of stress was demonstrated when a fisher broke down when discussing restrictions on fishing and declines in stocks. Regardless of adaptive strategies of non-destructive gear and smaller boats, the MGF is perceived to have significantly declined over the last ten years by fishers, and the future remains uncertain.

D. New Bedford

DI. Overview of New Bedford Groundfishing

New Bedford is a long, narrow working class city built from south to north along New Bedford Harbour, facing the city of Fairhaven across the water. Its waterfront constitutes the city's industrial fringe, providing dock space at several clustered, crowded locations for what is arguably the largest fishing fleet in the Eastern United States, if not in terms of numbers of vessels then certainly in terms of the tonnage of those vessels, the numbers of people employed in fishing and fishing-related industries, and their capacity to land fish and shellfish. Along with scallops, groundfish are the fleet's primary target species.

Of all major groundfishing ports in the eastern United States, the wider community of New Bedford is probably the most dependent on the MGF as its economic heart and soul. Not only does New Bedford trace its history directly to a fishing past, beginning as a whaling centre and evolving into the dynamic industrial scalloping and dragging fisheries of today, as the manufacturing base of New Bedford erodes away, the fisheries remain one of the few potentially high-income pursuits available.

Under the current economic conditions, New Bedford's attempts to promote heritage tourism seems like a somewhat cynical assertion that the city was far more important as a centre of commerce in the past than it is today. Its heritage as a whaling centre—nicknamed Whaling City—a centre of manufacturing built up around textile and clothing mills, and as a tolerant northern city known for harbouring fugitive slaves prior to the Civil War is chronicled in the halls of museums and around the city's streets on visitor walking tours. Physical remnants of this past poke through the streets with artefacts as humble as cobblestones and as towering as museums and merchant houses that provisioned ships with supplies for long excursions at sea.

Social and cultural remnants of that past appear in the chipped wooden whales lining building facades and the faded insignias of labour unions that dominated the city earlier this century. About New Bedford Melville wrote, "But think not that this famous town has only harpooners, cannibals, and bumpkins to show her visitors. Not at all. Still, New Bedford is a queer place. Had it not been for us whalers, that tract of land would this day perhaps have been in as howling conditions as the coast of Labrador.... In New Bedford, fathers, they say, give whales for dowers to their daughters, and portion off their nieces with a few porpoises a-piece" (1851: 40).

Imagining that past is no more difficult than moving from pier to pier along New Bedford Harbour, where a sizeable groundfish and scalloping fleet has replaced the whalers, or watching striking workers picket Cliftex Corporation over managers' refusals to increase workers' wages. From Fairhaven, across New Bedford Harbour, the city skyline boasts an impressive array of smokestacks that, unfortunately, project skyward from closed and boarded-up factories. Although living reminders of the heritage of fishing and manufacturing abound in New Bedford, signs of working class decline are equally evident. These range from the devastating superfund clean-up site on the northern edge of town to the disconcerting legacy of 52 sunken, sold, burned, dispossessed, and outlawed vessels that have exited groundfishing since 1984 and the 31 scallop vessels similarly cut from the fleet.

Struggling to hang onto their legacy, groundfishermen and unionised, blue collar workers find themselves in similar straits: both have witnessed the erosion of their ways of life over the past two decades and both have been chagrined by political and economic developments in Massachusetts that favour high-tech, entrepreneurial job growth and turn their backs on blue collar, local, traditional occupations. The Massachusetts economy has succumbed to the lures of globalisation and an ever-expanding service sector capable of providing little more than minimum wage jobs. In New Bedford, among the more trenchant reminders of this has been the repeated attempt to build on the empty promises of the state lottery by admitting a casino into the city.

Globalisation in New Bedford has paved the way for the loss of blue-collar jobs to cheaper overseas production sites, for the growing reliance on imported seafood, and for the increasing presence of foreign labour in the processing plants. Ironically, many New Bedford fishermen have been involved in global politics for generations. Two transnational communities make up a sizeable portion of the fishing fleets that fish out of New Bedford: Norwegians and Portuguese. Another, smaller group of fishermen come from Nova Scotia.

Most important in the groundfishing industry are the Portuguese, who come from mainland and island territories of Portugal, including Cape Verde and the Azores. They arrived in several waves through the 19th and 20th centuries and have established an ethnic enclave in which knowledge of English is no more a necessary prerequisite to survival than it is among Cubans in Miami or Puerto Ricans in Spanish Harlem (Baganha 1991).

Strong ties to Portuguese villages still exist, making the community transnational in the textbook sense of the word, comprised of “processes by which immigrants forge and sustain multi-stranded social relations that link together their societies of origin and settlement” (Basch, Glick-Schiller, and Szanton-Blanc 1995: 7). Among the New Bedford Portuguese, these social relations are based first in family and second in village or region of origin, keeping the community in New Bedford alive with the images and cultural paraphernalia of Portugal. Even second generation Portuguese, born in the United States, express allegiance to Portugal rather than the United States. A boat-owner that was closely knit into the Portuguese community of New Bedford, in response to a question about her nationality, said, “Well, I consider myself Portuguese. My mother was born American, first generation; I’m second generation. I’m first generation through my father. I’m Portuguese; I’m not American, I’m Portuguese.”

The strength of the Portuguese community, similar to the Italian community in Gloucester and the Norwegians in New Bedford/Fairhaven, was noted by Doeringer, Moss, and Terkla in their mid-1980s study of New England’s fishing economy (1986), serving as an important predictive variable for many of the same behaviours we witness in the fishery today. How Portuguese fishers adapt to the current crisis and future regulations derives in part from the collective funds we refer to as social capital, which Doeringer, *et al.* called “family capital,” and in part from their membership in a community that spans two and sometimes more than two nations.

Table 13. Employment in New Bedford by Economic Sector

Sector	Number	Percent
Technicians, Sales, Admin.	10 947	24%
Operators, Fabricators	10 387	23%
Managers, professionals	6 823	15%
Service occupations	6 194	13%
Precision crafts, repair	4 801	10%
Self-employed	1 684	4%
Farming, fishing, forestry	1 033	2%

The blue-collar character of the city is reflected in the area's labour force statistics, with persons employed as "operators, fabricators, and labourers" rivalling those who have streamed into the "technical, sales, and administrative support" category.

These figures, based on the US census, underestimate the numbers of the New Bedford/Fairhaven fishermen by about 50%, presumably because they include information only from fishermen who live within New Bedford city limits and leaving out those who live in surrounding communities yet fish out of New Bedford. Nearby Tauton, for example, has its own sizeable Portuguese community, and a sizeable portion of the fleet is based across the harbour from New Bedford, in Fairhaven. More accurate counts of fishermen and vessels come from local observers.

D2. Port Infrastructure and Demographic Information on New Bedford/Fairhaven

New Bedford's waterfront looks like an industrial port. A small fleet of recreational crafts tie up at the marina on Pope's Island, between New Bedford and Fairhaven, but along both the New Bedford and Fairhaven waterfronts, 80' to 100' (24 to 30.5 metre) vessels tie up, three deep, at between 15 and 20 locations up and down the harbour. Although a handful of smaller (45' to 70'—14 to 21 metre) vessels tie up among or nearby the larger vessels, New Bedford's fleet is clearly dominated by the larger vessels. Estimates of the fleet's size are as indicated in Table 14.

Table 14. New Bedford/Fairhaven Fleet Characteristics

Characteristic	Number
Vessels Registered	280
Vessels Fishing out of Port Regularly	412
Draggers	190
Scallopers	155
Gillnetters	35
Longliners	16

Source: New Bedford Seafood Coalition.

These figures are not too different from other recent estimates drawn from direct field observations rather than from licensing data. McCay, *et al.* (1993: 143), for example, stated that, “There are approximately 300 boats in New Bedford. Thirty to 40 are small draggers in the 45–65 foot range, 120 are large draggers in the 75–85 foot range, and 150 are scallopers in the 75–85 foot range.”

These vessels employ around 2 000 fishermen; the dragging fleet, by itself, employs somewhere between 600 and 1 200 fishermen, as groundfishing vessel crews range in size from three to six individuals. Crew size on both scallop and groundfishing vessels has shrunk in the past few years, in part because of the crisis and in part due to regulations designed to curb fishing effort. Some captains and boat owners have adopted crew rotation schedules—a variant of job-sharing—instead of laying off crew.

While many vessels are owner operated, there still remains a contingent non-operator vessel owners within the New Bedford fishery that marshal fleets, hiring captains and crew. These individuals set some of the rules that govern labour relations throughout New Bedford, negotiating vessel shares and hiring practices, but union representatives we spoke with in New Bedford reported that payment systems and crew-captain relations vary widely from vessel to vessel. In the late 1980s, boat owners who fell into this category numbered 32; typically, these owners owned anywhere from one or two to six or seven vessels. As a sign that vessel owners’ powers are increasing, during the strike of 1986 the union argued for a 42–58% split in profits, with 42% going to the owners, and owners desired a 49–51% split. A decade after the strike, the split on union vessels is 46–54%, with the owners receiving 46%.

In addition to boat owners, captains, and crew, the full New Bedford/Fairhaven fleet generates business for around 75 seafood processors and wholesale fish dealers and 200 other shore-side industries. Together, these businesses provide employment for around 6 000 to 8 000 additional workers.

The above figures, of course, include only those individuals employed directly in fishing and fishing-related industries; missing from these numbers are the health providers, real estate companies, banks, insurance agencies, and small business people who rely on the families of fishing industry employees for a percentage of their business. Even without considering these individuals, between five and eight per cent of the people in the New Bedford SMSA — far higher when we include members of their families — receives its livelihood primarily from fishing. Even a conservative estimate, assuming two other individuals supported by each fisherman and fishing-related worker employed places the proportion of the population dependent on fishing at between 11% and 18%.

The support industries that fishermen we interviewed mentioned most often as directly dependent on the industry were fuel, ice, and food/supplies. During a major fisherman’s strike of 1985–86, newspaper coverage focused on the plights of fishery-related businesses within the first two weeks of the strike, suggesting the effects of reduced fishing are felt immediately and deeply along the waterfront. A single vessel’s trip supplies were listed as including, “40 dozen eggs, 20 steaks, 20 pounds of bacon, 10 gallons of orange juice, 18 gallons of milk, and 37 loaves of bread” (*Sunday-Times*, 5 January, 1986: A1). A company supplying 45 vessels lost a quarter of a million dollars before the strike was 10 days old and laid off 22 employees. Besides food suppliers, other businesses affected immediately were welders, restaurants, ice companies, fish wholesalers and processors, and dock workers. Fishermen we interviewed for this study commented that the current downturn in fisheries had had ripple effects through the support sector as well. According to one:

“Well, what has happened is I have a welder that does most of my work, and he’s an individual—once in a while he’ll have a helper, but most of the time this guy works for himself *by himself*. When money gets tight with me, I can weld myself and I can work on the boat. So that saves me a couple of hundred dollars, but it also takes a couple hundred out of his pocket. So a lot of things that you used to pay someone to do, we do ourselves. It’s a ripple effect; as soon as you don’t have

the money to pay for your services, you stop getting them. And with the more time that the boat now has to stay ashore, if I'm going to be home for a week, I can spend one day or two working on the boat."

Another put it more succinctly, saying, "Fishermen invest in a lot of money in the community, so there's a whole industry prepared for them, like ice, fuel, food, clothing, the restaurants. They like to go out and drink and eat and socialise" (translated and paraphrased by research assistant).

These observations reflect the official positions of the city fathers. In 1986, the head of the Greater New Bedford Chamber of Commerce claimed that the strike was costing the metropolis over USD 1 000 000 per day and that, "For every dollar paid to a fisherman, USD 4 to USD 4.50 circulates through the local economy." In 1992, before the current fishing crisis, the average annual income for a fisherman in New Bedford was USD 36 534. Unfortunately, New Bedford/Fairhaven catch revenues declined from USD 151.3 million to USD 107.5 million between 1992 and 1993.

The close ties between the city and the fleet is both visible and invisible, material and symbolic. When vessels come ashore, captains and crew join service personnel to repair the routine wear and damage of sailing. Seafood wholesale and processing companies come alive with the catch. Trucks wait in the parking lots. Beside them, at nine, noon, and three, carts sell sandwiches and sodas to the cutters and lumpers. During the 1985–86 strike, 115 members of the Fish Lumpers Union sat idle while vessels remained ashore or began fishing out of Provincetown.

New Bedford now has a fish auction modelled after the Portland Display Auction, but many vessels remain obligated to seafood dealers and processors by virtue of credit relations or access to docking space. The New Bedford Seafood Coalition cited the auction as one of the "positive notes" in recent times, saying, "The privately operated Display Auction has attracted a wider range of fish buyers which are seeking a wider range of fish other than the traditional species of fin fish and flounders. Among those species are hake, catfish, cusk, mud skate wings, halibut, fluke, mackerel, red fish, and blue fish" (New Bedford Seafood Coalition, 1996).

Relations among boat owners, captains, and seafood merchants are highly varied and often fraught with suspicion and hostility. Most fishermen reported that the 1980s strike signalled the end of a long era of fairly co-operative relations. Within the fleet, divisions exist between vessels, between scallopers and draggers, between fleets based on docking locations, and between different ethnic groups. The Portuguese tend to concentrate on draggers, although this was more the case in the past than today, and some Portuguese have switched from dragging to scalloping. Switching of this nature is possible, but costly. According to one fisherman who had made this switch:

"My first three boats were draggers, and the boat that I now have is a combination dragger/scalloper. We're scalloping right now; we've been scalloping since 1987. I was dragging from 1974 to 1987. In that period of time, I went scalloping on occasion; I went for a few months on two separate occasions. In 1987 I changed to go scalloping. Draggers weren't making any money.... I figured I would go back and I've been at it ever since. Now it's like flipping a coin to see who has the best deal, you know, because the draggers and scallopers are both struggling.... I could go dragging, but it's cost-prohibitive to change back and forth. You're talking USD 30 000 or USD 35 000 every time you change, so you can't do that if the give you 50 days to drag. It isn't worthwhile."

These comments and the lack of switching among different fisheries in New Bedford reflect the degree to which the fleets have become specialised, a common characteristic of large-vessel fleets. This specialisation is not confined to fishing alone but spills over into the support sectors and labour relations on vessels as well, making adjustments to changes in the industry more difficult than in other ports, such as Point Judith and Chatham, where fishers engage in more generalised fishing strategies. The history of the union presence in New Bedford has regimented labour-management relations in ways that govern crew recruitment and policies aboard vessels, although it was widely reported that the late 1980s strike, chronicled briefly below, shifted power away from the union and thereby deregulated, to some degree, labour relations in the community and aboard vessels.

D3. Fishing Organisations and Associations

As one of the oldest ports in New England, with its strong ethnic enclaves, organisations and associations serving the New Bedford/Fairhaven fishing fleet are both numerous, multi-faceted, and often well-developed in terms of political sophistication and their abilities to lobby, formally and informally, on behalf of their members. In keeping with the area's blue-collar, working class character, an estimated 600 captains and crew were represented by the Seafarers' International Union during the 1986 strike, as well as the 115 represented by the Fish Lumpers Union mentioned above, but these numbers have declined over the past few years, due to both the general declines in union membership throughout the United States and the difficulties of the fishing industry under conditions of declining stocks. Currently, the Seafarers Union represented 350 fishermen, or around 42% fewer than they represented only 10 years ago. Weakening of unions is occurring throughout New Bedford, in fishing related industries as well as on the vessels and in the ailing textile mills. A fuel barge operator's wife succinctly described the common union-busting practice of closing a union shop and reopening it with a new name yet without a union, saying, "His [her husband's] place of employment used to be called one thing on a Friday under a union contract; the following Monday they opened up with another name without a union contract, a cut in pay, loss of a pension plan, loss of medical benefits, loss of four weeks' vacation, loss of sick days... The union that the old place used to be represented by was notified and this was over a year ago and nothing has been done by them."

New Bedford unions, historically, provided pension funds for fishermen, negotiated share systems with boat owners, and regulated labour relations on board vessels as well as governed crew recruitment, retention, and hiring and firing policies. With the decline of unions, most of the fishermen we interviewed for this study desired more effective representation of the fishing industry, in their relations with boat owners and seafood dealers and with the federal government. Increasingly, of course, the federal government is viewed as the major threat to their future as fishermen. The following statement, from a boat owner who is also married to a fisherman, captures the spirit of how fishers view their interactions and history with the federal government, and such feelings guide their political behaviours:

"As far as I'm concerned, the American government are assholes. We wanted regulations 15 years ago—15 years ago—to manage the fishery and they said, "No need." Now, a fisherman is a hunter. When you *ask* to be regulated, there's something wrong. But when they say 'No', you just do it. And they just let us go, just let us build more boats and more boats and bigger boats and better boats. And now that the stocks are very low, now they're trying to force 15 years of regulations in two years. And they kill us. If they'd listened to us right in the beginning, and regulated us when we *asked* 15 years ago, we could live with this regulation and that regulation and just work it within our schedule. You cannot compact something in two years.

“We suffered, but we could adapt to it [Amendment 5]. We could adapt to it. It was very, very stringent, but we could adapt. But now with Amendment 7, they’re going to take the 200 days that we had to make us fish 139 days of the year. It’s like you working—you work— could you survive, without your parents, just you alone, working 139 days a year? And next year is going to be 88 days.

“They know that regulation is needed, but not like this. They knew this 15 years ago, and we went to the government and told them, ‘You have to stop this, you have to close off that area because of juvenile fish species,’ and they wouldn’t listen because there was no need. So now all of a sudden, they’re being threatened with a lawsuit and it’s like, ‘We have to do it now.’ So 15 years of concern, they’re trying to jam-pack, like I said, in three years. They’re not going to do it. We’ll never survive.”

Recently, as in other ports, the fishing crisis has spawned increased organisational activity among fishers. One organisation attempting to represent more fishermen and to establish linkages with other Massachusetts fisherman’s organisations is the New Bedford Seafood Coalition, whose activities include providing technical advice to government and industry, monitoring regulatory developments, communicating with the media about fishing issues, and drawing together fishing organisations throughout New England. The difficulties these and other organisations have in a place like New Bedford is that the loyalties of fishermen there run in other directions, away from a unified front and toward the isolationism of the ethnic enclave.

Strong associations have always been associated with ethnic enclaves in the United States, and the Portuguese and Norwegians in New Bedford are no exceptions to this. Historically, ethnic associations in the United States have spawned insurance coverage programmes, access to credit, and social clubs, often building centres of cultural activity, financing churches, and providing social networks for job leads, temporary or permanent housing, and other forms of assistance.

In New Bedford, a Cape Verde Cultural Centre and an Immigrant Assistance Centre provide some limited services to the Portuguese. The Assistance Centre provides translation services in particular, while the Cape Verde centre promotes Portuguese cultural education within the public schools, attempting to enhance the status of Portuguese among school children and instil pride in Portuguese youth. As noted above, many second generation Portuguese have been so thoroughly enculturated in Portuguese language and culture that they do not consider themselves Americans. The enclave has fostered several Portuguese restaurants, taverns, food stores, and other businesses that cater solely or primarily to other Portuguese. The New Bedford telephone directory lists the following local Portuguese clubs:

- Monte Pio Luzo Americano Corp.
- New Cape Verdean Band Club.
- Portuguese American Athletic Club.
- Portuguese American Social Club.
- Portuguese Continental Union.
- Portuguese Sports Club.
- Young Cape Verdeans Athletic Club.

One of our informants described the Portuguese community rather well, saying:

“All day they are dealing with Portuguese people, so they never really *have* to learn the language. So because of that, they never learn the language, because they deal with Portuguese people, they go to stores and they speak Portuguese, they go to the doctor’s and they speak Portuguese. So because everything is handed to them in Portuguese, they never really have to go and learn English.... Go to the stores around here, the fish markets, the Portuguese variety stores, you go to the doctor’s, you go to Social Security, you go to Welfare—I can guarantee you there are people that are employed in these agencies that speak Portuguese. So why learn? Not only that, we’re talking about the elderly, we’re talking about people that have no education in Portugal... They are illiterate, they don’t even know how to write their names; they do a little cross. That’s how—they do a cross instead of signing their names. So if they’re illiterate, they’re never going to learn the language, so it’s very tough for them. They can’t read and write in their own language, never mind coming into the United States and learning how to read and write English; that’s unheard of, and they don’t.... The New Bedford Welfare Office, they have people that speak Portuguese. Social Security, they have people that speak Portuguese. You go to doctors, there are certain doctors that speak Portuguese. You go to banks. There’s even a community bank that is Portuguese. So we are in the heart of the Portuguese community—agencies, stores around here, they all speak Portuguese. So because of that, people don’t feel like they need to speak English, which they don’t.”

The Norwegians formed a more tightly knit ethnic enclave in the past than today. Their community in New Bedford drew most of its original membership from a single island in Norway (Karmøy Island), and was built around fishing. Early fishermen, arriving around the turn of the century, established the New Bedford Fish Supply, which still operates and which used to support newly arriving fishermen by providing them credit (without interest) and outfitting their boats. This practice ended during the 1960s, when immigration from Northern Europe became more regulated, particularly after the 1965 Immigration Act.

Unlike the Portuguese, the most recent Norwegian generation has fewer concrete ties to Norway and does not express the allegiance we so often associate with transnationalism. The Norwegians have established a church, which, along with an organisation called the Friends of Norway, still serves as the cultural heart of the community, although there are no obviously Norwegian clubs listed in the telephone directory.

The strength of ethnicity as an organising principle in New Bedford contributes to the conflicts that exist within the port, between fleets and between different participants in the industry, as well as undermines the abilities of New Bedford fishermen to organise a unified challenge to Amendment 7 or other regulations. The Portuguese in particular have tended to withdraw more deeply into their enclave as the crisis deepens, considering returning to Portugal as a viable response to economic dislocation and resisting institutional attempts to draw them into the wider economy through retraining. As evidence of this, our Portuguese field assistant translated, paraphrased, and summarised the words of three fishermen she interviews as follows:

Fisherman No. 1: He says with this crisis he might return to Portugal, because there’s nothing for him to get him attached here. He says his English is worse, because when you arrive in New Bedford, you lose your English because everybody speaks Portuguese.... He said they haven’t heard anything, they haven’t been informed officially, or have not informed about the new legislation, although they are aware of it... There should be an entity there to retrain Portuguese fishermen, which there is not. He said there should be support for new jobs; there should be employment assistance and social assistance for free. They say that they don’t know English,

they're not privileged with a lot of assistance that comes because they're not aware. He says Portuguese are too much preoccupied with their own nose and they don't care on getting united and trying to solve their problem. He says they think little, they just think on themselves. And they've got to get united to solve all this situation, they would be better off.

Fisherman No. 2: He stays out from the government, it's all a lie. Who's going to get the most advantage are the people who are not in the fishing. The fisherman per se is not going to get anything These laws are not for the fishermen, not even for the boat-owners. It's for people that have never been in the fishing, like all those programmes for retraining. If you look at them and see who the people in front of them, most of them were not fishermen. And he says it's not that he's 47 years old, almost 48, that he's going to learn construction. There's no work for construction. Maybe 2% of the new fishermen, of the young fishermen, maybe they can be retrained. But in his age, and also there is a language problem.

Fisherman No. 3: About the retraining programmes, he thinks that the money is just for some people to make money, and not for the real fishermen. Because these associations do not give to the fishermen, because you have to be unemployed to be retrained and then there's the language problem But how can you be totally unemployed if your wife cannot supply [income]? That's a big stress at his age. What can he do? He's 56 years old learning English.

D4. Social dimensions of the MGF in New Bedford/Farihaven

The common method of bringing new fishermen into a fishery through family relations or long apprenticeship-like training regimens is, in New Bedford's groundfishing industry, reinforced by the heavy ethnic, transnational component to the fisheries. This is true of groundfishing more than scalloping, since Portuguese dominate the groundfishing industry and have constructed a more intricate ethnic enclave than the Norwegians. Yet both the Portuguese and the Norwegians in New Bedford have built their communities in concert with the growth of occupational communities based on fishing, and both communities have drawn on fishing communities in Portugal and Norway for crew during times of industry expansion.

Because of their close ties to fishing communities in the Azores and Cape Verde, crew recruitment has an international dimension among the Portuguese, making apprenticeships on vessels less necessary than in other ports. While this practice allows the fleet to expand during times of economic growth, the reverse is less common. That is, new immigrants and their families can become entrenched in the Portuguese community of New Bedford relatively quickly. Although most state that they will deal with the current crisis by returning to Portugal, others point out barriers to this response:

“A lot of the [Portuguese] men think the same way I do, but their wives don't want to leave their children. Their children get married here and have children—grandchildren—and they don't want to leave. See I'm not like that. My children are my children because I gave birth to them, but I do not own them. My life is with my husband. I started and hopefully I'll end with him. My children have their own lives. I'll help them as much as I can—*live for them*, no, because they wouldn't live for me. They're going to live for their own selves, their own lives. And I may do the same thing. And a lot of Portuguese I know, they won't leave because of the children and grandchildren.

Above we mentioned that the early Norwegian arrivals relied on the New Bedford Fish Supply to outfit them and provide them with crew jobs and credit to buy and put to sea their own vessels. This practice has been common among the Portuguese as well, and endured to just before the current crisis. According to the wife of a Portuguese fisherman, newly arriving Portuguese fishermen routinely attached

themselves as crewmen on Portuguese owned vessels, and sometimes acquired vessels with the help of Portuguese fish buyers or boat owners. Under these conditions, however, it was not uncommon for the established Portuguese to retain up to 50% ownership of the vessel, even after the debt was repaid. During the process of repaying the loan or working for other Portuguese as crew, however, local observers reported again and again that conditions for crew could be harsh, bordering on cruelty. Yet complaints are uncommon, in part because the tight connections between New Bedford and small villages in Portugal would result in shame for the complaining party. Again, these mixtures of benevolence and cruelty, enforced via gossip and shame from the home community, are common features of transnational communities.

Relations between Portuguese crew and Portuguese boat owners reflect one dimension of the Portuguese community that has been observed particularly among peoples who compete over what they perceive as scarce resources. While the New Bedford Portuguese tend to be extremely closed to outsiders and densely knit in terms of community rituals, kinship ties, and so forth, several sources of friction exist within the community, making it difficult for them to organise or engage in effective political activity. Interviews with the wives of Portuguese fishermen referred many times to problems of families envying one another and constantly competing to own nicer cars, houses, clothes, and so forth:

“You cannot get the wives involved, they just don’t want to. They’d rather sit in the café and talk about this one’s daughter and that one’s son—anything but worry about their own financial future. Portuguese women are terrible, terrible. They’re nasty. You’d think that they would be involved in what’s going on. As far as Portuguese fishermen—that’s what I’m talking about—Portuguese fishermen will come in and give their wives their check. That check, she takes care of, she’s got to feed this and that and everything else. I guarantee that check is not the same as it was five years ago; it’s less. I would want to be involved. They don’t; they sit down, they crochet, they gossip like hell about this one’s life and that one’s life, and this husband putting the horns on somebody else—and they don’t care about what’s happening to them.”

Another woman, her comments translated and paraphrased, said something like: “She doesn’t belong to any fishing support groups within the community. She pretty much has a life of her own, very closed. She says yes, sometimes fishermen help each other, but they feel a lot of jealousy and envy when they talk, like between the families and the wives, there’s a lot of competition, like ‘my house is better, my car’s better, my clothes are better,’ and so forth.”

Similar comments were elicited from a Norwegian woman. Summarised, she expressed the idea that, although the Norwegian community presents a very organised ethnic appearance, there are strong undercurrents of greed and envy working against effective unification. This woman added that it was better to conduct business outside the family, without infusing one’s business activity with a strong ethnic component, suggesting that with family ties also came patriarchal and authoritarian relations.

These observations of Portuguese and Norwegians about their own ethnicity reflect the ambivalence that often characterises membership in a strong ethnic community in the United States. One of the Portuguese we interviewed expressed rather well the feeling of straddling two cultures in New Bedford, saying,

“As far as perceiving myself, I was 11 when I came to this country, I went to school here. My very good friends were born in the United States, my daughter was born here, and I do a lot of American things. But at the same time, I’m really torn in-between. I go to Portugal and I feel very Portuguese. I’m in the United States, and when I’m dealing with the Portuguese, I feel very Portuguese. When I’m dealing with the Americans—when I go to school or something like that—I feel very American. But I don’t know. I’m half-and-half.... I know the [Portuguese] community

very well. I know a lot of people that are also in the same situation; they help the community in general. And yeah, I am very much aware—very much aware of the problems and very much aware of what is going on in the community. We have to be in order to help people.”

On the one hand, members of such communities spend a great deal of time and energy securing jobs, housing, and other forms of assistance for new arrivals and for those most severely affected by downturns in economic activity. These behaviours, however, draw on collective funds and often need to be enforced, subtly or overtly, through meaningful social ties and appeals to shared cultural symbols of sharing and co-operation. During times of economic plenty, when everyone’s vessel shares are increasing, enforcing these behaviours may not be necessary; when vessel shares begin to shrink, enforcing sharing and co-operation becomes more and more necessary and increasingly difficult. Under these conditions, we should not be too surprised to find envy and gossip emerging within the community and dividing families from one another.

D5. *Adaptations and Adjustments to Crisis*

Specific responses to the current crisis have been less varied in New Bedford than in the other ports. Movement into alternative fisheries is somewhat rarer here than, for example, among those Portland fishers who have begun gearing up for shrimping. We noted earlier that the New Bedford fleet is highly specialised. While this seems accurate for most vessels, participation in alternative fisheries is not unheard of. A study conducted in 1992–93 (McCay, *et al.* 1993) suggested that some New Bedford fishermen were experienced in the squid, dogfish, butterfish, and whiting fisheries, and many of the fishermen have increased their efforts toward monkfish, shifting away from the mainstays of yellowtail flounder, winter flounder, and cod. We can expect these behaviours to increase with further restrictions on catch, although reductions in days at sea may result in focusing fishing effort on those species with which the fishers are most familiar.

We noted earlier that crew sizes have diminished over the past few years, and that some vessels have instituted crew rotation schemes. These seem to be typical responses to the fishery crisis, in New Bedford and in the other ports. How often a crewman stays ashore is directly related to how much his income drops, of course, so that a crewman who has to sit out one out of every four trips, assuming catch remains relatively constant, will see a one quarter drop in his income.

General responses to this and other crises give little cause to expect that fishermen here will emerge from this crisis more adaptable or in a stronger position. New Bedford/Fairhaven residents displaced by the fishing crisis of the past two to three years have dealt with and are dealing with the crisis in ways not uncommon among blue collar workers and among members of transnational communities: predictably, those without strong kinship or social network ties have turned to government assistance, particularly unemployment compensation, as well as formal political activity; those Portuguese who are part of the transnational community have either returned to Portugal or have begun planning to return. In recent history, the crisis most vivid in fishermen’s minds was the 1985–86 strike; recounting the events of that struggle may provide some clues to the ways that New Bedford fishermen—particularly those without strong ties to ethnic communities—will deal with the current crisis.

They began the day after Christmas in 1985 during a slow fishing month, and involved somewhere between 65 and 100 vessels—the Seafarers’ Union claimed to represent 100 vessels, the owners claimed they were negotiating with only 65. One source of discrepancy came from the fact that some non-union fishermen joined the picket lines in support of unionised fishermen, showing the extent to which the fishing identity influences behaviour in a port like New Bedford. During the strike, many non-unionised vessels left port and began landing their catches in Boston and Provincetown (in part from fear

unionised fishers would disable them), exacerbating the strike's impact on local businesses and creating the impression that more vessels were involved than actually were.

The strike centred on the relative shares of the catch, trip expenses, the pensions fund, and control over hiring and firing practices aboard the vessels. Representing the draggers, the union wanted a 42%-to-owners–58%-to-crew split in shares, with owners covering trip expenses, or a 41 to 59% split if the crew covered expenses. Owners wanted a 49 to 51% split if they had to cover expenses or a 47 to 53% split with crew covering expenses. In addition, the union wanted to keep the pension fund; while the owners wanted to distribute the then accumulated USD 13 million to eligible fishermen, and abolish the fund. Finally, regarding crew hiring, owners wanted captains to have the right to assemble their own crews while union representatives wanted to establish a hiring hall, placing crew on vessels according to seniority, experience, and skill.

More telling than the contractual dimensions of the strike were the community responses, both inside and outside the fisheries. While many of the businesses dependent on fishing simply desired the strike to end, support for the union—the fishermen themselves—was widespread. As just noted, crew from non-unionised vessels showed their support of unionised fishers by walking picket lines, vessels that continued to fishing landed their catch and purchased their trip supplies elsewhere, and local restaurants gave away free sandwiches, soup, and coffee to the striking fishermen. As the strike dragged on for ten-day and then two weeks, New Bedfordians began taking sides, dividing along predictable lines of power and class. The mayor and police moved to protect vessels that continued to fish, dealers and processors who continued to handle the catch, and suppliers who continued to outfit crews for trips. Owners, owner-operators, and crew of non-unionised vessels appeared to support the striking fishermen early in the strike but then resumed fishing after the strike was about two weeks old, sailing with reduced crews but sailing nevertheless, and operating out of nearby ports like Provincetown and Boston.

These behaviours suggest that while the spirits of co-operation and unity pervade New Bedford, they quickly wither under pressure to meet mortgage payments and pay bills. If crisis reveals allegiance, it also reveals how short-lived is the effectiveness of mere allegiance to guiding behaviour. New Bedford simply cannot tolerate an idle fleet for long.

A crisis of the kind we are witnessing in the MGF, piecemeal in character and thus distinct from the community's experience with the strike, may prolong the spirit of allegiance over a long enough time period to identify coping strategies and strengths in the community's stores of welfare and assistance. Already the Immigrant Assistance Centre has expanded its services and identified new sources of assistance to help fishers through the crisis, although the most common response reported to us was not so much dealing with the crisis as fleeing it. Those fishermen who have not considered moving or have not already moved back to Portugal have considered or begun migrating into new areas and new waters, predominantly into the southern range of the MGF (to Cape Hatteras) and into the South Atlantic. These areas, of course, have begun tightening up their fishing regulations as this occurs.

In their observations in New Bedford around a decade ago, Doeringer, Moss, and Terkla claimed that “kinship vessels” (primarily Portuguese groundfishing vessels) in New Bedford could weather economic downturns more easily and for longer time periods than capitalist vessels, adopting measures such as rotating crews instead of simply laying off crewmen and, by such means, spreading the effects of the crisis over a large population, sharing the misery as much as they share the successes of profitable fishing seasons.

The negative side of this practice was that one's ties to the local society and Portuguese enclave were extremely tight. Consequently, those most severely affected by downturns in the fisheries were unwilling to migrate to more robust economic growth centres than those whose ties to the local area are

fewer and weaker in nature. Referring to both the Italian fleet in Gloucester and the Portuguese fleet in New Bedford, Doeringer, Moss, and Terkla (1986) expressed this as follows: “Economic and kinship factors strongly tie workers in the fishing industry to their communities and therefore adjustment processes tend to be unusually localised.”

While this may have been true ten years ago, among the Portuguese fishermen of today, one commonly stated response to the current crisis is to move, or at least consider moving, back to Portugal. This may be one of the only options for those who lack skills in English or other appropriate labour market skills, as the following boat owner’s quote suggests:

“And you know I really feel bad for my Portuguese fishermen.... The ones I’ve known since I was small, my father’s friends, the ones I went to school with, the ones that are my husband’s friends—they’re my Portuguese fishermen. I feel bad for them, because their language is unreal. You don’t understand. Portuguese fishermen deal in a Portuguese society. They go fishing with Portuguese. They come home, in the house is all Portuguese. They go to Portuguese cafes, Portuguese restaurants, Portuguese bakeries, radios, television, newspapers, all Portuguese. They’re not exposed to American, to English.”

D6. Conclusions

New Bedford’s fishing fleet—consisting primarily of large vessels that are highly specialised in either groundfishing or scalloping—is the community most heavily dependent on the MGF along the Atlantic Coast. As New Bedford’s manufacturing sector declines, groundfishing has assumed even more importance as one of the few occupational alternatives remaining in the city for individuals with little education but willing to work hard as apprentice fishermen aboard vessels. Unlike the other ports, reproducing the fishery in New Bedford will be less difficult because fresh, willing crews are readily available within the Portuguese transnational community as long as the industry remains viable.

The port’s transnationalism dimension and the propensity of the Portuguese to deal with difficulty by migrating are two of the port’s more resilient features, yet a large withdrawal of Portuguese fishermen from New Bedford would cut into the community’s economy quite deeply. Fishermen in New Bedford have weathered challenges in the past, yet seem to have emerged from them weaker in terms of unity and co-operation. The fleet remains active and large, somewhat intractable, only gradually expanding into new fisheries or new economic activities. How deep and how long a decline in fish stocks would have to run, or how restrictive regulations would have to become to dismantle the social, cultural, and physical infrastructure of New Bedford, however, is something we are not likely to learn during the current crisis.

E. Point Judith, Rhode Island

E1. Overview of Point Judith Groundfishing

Commercial fishing in Point Judith is a historically recent activity. The port lacks the complex fishing traditions and infrastructure of the larger ports such as Gloucester and New Bedford. Here, a fleet consisting of offshore and inshore vessels follow a cyclic, shifting pattern of resource use that sets Point Judith apart from the northern New England ports. Point Judith boats are diverse in their annual round and approach to the fisheries as opposed to New Bedford boats which only go after groundfish. Fishers are employed full-time as they switch fisheries and boats during the year. The port most similar to Point Judith is Chatham, although Chatham has no large offshore vessels in its fleet.

Beginning in the 17th century and through most of the 18th, the region of southern Rhode Island surrounding Point Judith was a farming community. Pictures from the turn of the century show plowed fields and farm settlements where there is now secondary growth forest and housing developments. The textile industry started in 1802, became prominent in the late 19th century, and then collapsed. The 20th century has seen the decline of agriculture and mill manufacturing, and their replacement with the tertiary services sector, including retail trade, health care, education, and tourism. Commercial fishing is a secondary industry that came to prominence in the 1930s. Unlike other primary sector industries such as agriculture which have declined, fishing advanced in importance (Table 15).

Table 15. Comparison of Fishing/Agricultural Employment in Washington County, Rhode Island

Year	Agriculture	Fishing
1930	1 388	178
1940	847	128
1950	742	197
1960	582	240
1970	304	327
1980	NA	NA
1990	NA	*390

*Estimated from number of commercial boats and average crew size.

Source: Washington County Census records.

The commercial fishery of Point Judith did not play a prominent role in the regional economy until the construction of a breakwater in the mid-1930s. This effort, part of Roosevelt's New Deal programme, was carried out by young of men in their early twenties from Kingston and Narragansett. The first commercial fishers used hook and line, beach seine and weir fishing by the middle of the 19th century. Beach seining for bass and menhaden began around 1867 (Whaley 1939: 4). Seining was carried out by 'fishing gangs', characterised by fish houses along the beach with bunks in which they slept until it was time to fish. Gangs were equipped with two boats and a seine, and this fishing practice continued until about 1940. Trap fishing and lobstering were also important early fishing methods in the area.

After WWII, the fishing fleet expanded and a co-operative was formed (The Point Judith Fishermen's Co-operative Association). This included most all inshore groundfishers in the port. As of 1978, Point Judith's landings made up 61% of Rhode Island's total catch. In 1992, the total value of fish landed in Point Judith was USD 36.2 million.

With enactment of the 200-mile limit in 1976, fishing strategies began to diversify as lobster, shellfish, and swordfishing became important. These new fisheries did not require the same precision, or knowledge of the grounds as groundfishing. It encouraged a whole new generation of fishermen who worked outside the established Coop. Many of these newcomers had never fished before, but were making a lot of money. New entrants were also encouraged by inexpensive boat loans made available through the US Department of Commerce.

The expansion of the industry in the late 1970 pressured the Coop to put a moratorium on memberships. This was extended until 1986-87 when the Coop increased its processing capacity by moving into a new larger building. Yet during the Coop moratorium, other companies filled the niche created by the expanding industry, and by the time the Coop could accommodate the influx, there was little

incentive for fishers to join. The expansion of the Coop increased operating costs, and along with pressures from local and external (main market) competitors, contributed to its collapse in 1994.

The social cohesiveness of the Point Judith community was based on sharing the common occupation and traditions of the fishing lifestyle. Twenty years ago, there was a different atmosphere to the community. Bait processing and related jobs brought locals with no prior experience into contact with established fishers to share in the development of the industry. An event that represented this shared lifestyle was the blessing of the fleet. The blessing was marked with food, games, parades, and other festivities. Commercial fishing boats would be cleaned and decorated for the celebration to symbolically demonstrate their central value in the social and economic life pattern of the community.

Since the post-war days, significant change has come to Point Judith. Tourism is pushing the fishing industry into the economic background as the port becomes more gentrified (Dale 1992). A similar process typifies nearby Newport, where fishing has been overshadowed and incrementally reduced by more than a hundred years of touristic development (Bort 1981). For example, with the increasing costs of boat insurance, insurance companies refused to cover anyone hurt during the Blessing of the Fleet celebration: *“They went so far as to say, anyone participating, such as boat owners letting people on their vessels, would have their entire insurance cancelled”*. Such ‘insurance blackmail’ effectively ended the blessing, and the town officials never fought to keep this significant marker of the local fishing culture alive (personal communication, key respondent). This change represented a shift in social and economic alliances away from fishing towards tourism.

Areas where fishermen used to park before setting out to sea are now lots for tourists. All but one of the social gathering spots for fishermen have been converted into tourist attractions such as ice cream shops and restaurants. Weakening of the communal identity of fishers has had a negative social impact. A symptom of this is the changing role of the Point Judith Mission. The Mission initially helped fisher families in crisis with food and small loans. Over the years the emphasis moved towards helping fishermen with drug and alcohol addiction problems. Today, some key respondents feel the Mission has lost its community orientation as a support resource for fishing families.

Despite these changes, as one respondent put it, *“there is still a distinct community of fishermen here.”* Fishermen comprise a social and occupational network: *“People know each other.”* The small town atmosphere is punctuated by functions such as the Fishermen’s’ Scholarship fund, that recently had its annual game feast where USD 6 000 were raised for the sons and daughters of fishermen.

E2. Port Infrastructure

Port facilities, although small-scale compared with New Bedford or Gloucester, are adequate for the size of the local fleet. There are approximately 230 vessels of all types berthed in Point Judith (personal communication, Dan McGovern, Division of Coastal Resources). The area is not much bigger than 3 city blocks, but all the activity in the area is associated with some aspect of the fishing industry. Vessels are located at a number of docks, which extend perpendicular to the main street. Another set of docks extends off a large industrial area. Across from the harbour are a number of empty docks for seasonal recreational boaters.

There are numerous support industries along the water. The large industrial area at the North end of the street is where most fish processing is done. It has six processing plants including the former Point Judith Coop (now owned by an independent operator) and the Town Dock. Facilities include dockside fuel pumps, a single restaurant/store, bait shops, commercial marine suppliers, recreational suppliers, and vessel repair shops. Along the adjoining streets are several other restaurants devoted to seafood. The Block

Island Ferry also leaves from this port and promotes a large seasonal population of people passing through town.

The main docking facility is the Town Dock. It employs 50 people and hires between 20–50 part-timers as needed. Temporary employees work at the dock on a seasonal basis depending on the species. Permanent employees all live in the area, while part-timers live as far away as Providence.

Town Dock handles 12 permanent vessels in the 60–70 foot ranges. They do handle some vessels from other ports, but primarily deal with the 12 Point Judith vessels. Dock space does not appear to be a problem in Point Judith, as long as boats are out at sea. During storms the boats have to ‘raft-out’ which means they tie up to one another along the docks. Boats are charged a docking fee, which is handled by the State. There are more docks than processing places in town with a dozen different places to tie up. The Town Dock receives all manner of groundfish, although they do not process much cod and haddock.

Table 16. Town Dock Primary Species and Their Seasons

Species	Season
Squid	Year round, with the bulk in May
Herring	December to April
Mackerel	March to May
Whiting	Year round, with the bulk in summer
Scup	Year round, but recently scarce

At one time, the dock served as a cutting dock for yellowtail, fluke, and cod. About seven years ago it shifted its focus because of a decrease in landings for these species. Now they process little fish and deal primarily with squid, herring and mackerel. This has caused problems for those who continue to target groundfish. At least one fisher has moved his vessel to Newport, claiming that processors favour the larger offshore vessels. Other important species include butterfish, scup, and fluke. Fish product from Point Judith is considered to be of very high quality. It commands high prices in Fultons and the Boston Fish Market. The following table shows the Town Dock primary species and their seasons.

Squid, herring, mackerel and whiting are predominantly offshore midwater species caught by large (70’) vessels. Groundfish such as cod, flounder and haddock are primarily targeted by inshore medium length vessels but by no offshore vessels.

An ecological advantage for Point Judith fishers is that they are close to many of their primary stocks, including relatively new target species such as squid. Another advantage is that Point Judith fishers have access to mid-Atlantic stocks such as butterfish, which are approaching the northern most point for many species, as well as access to northern traditional groundfish areas and stocks. An important key to adaptability of Point Judith fishers is stock and gear switching. Of all the five groundfish ports, Point Judith fishers are the least dependent on the groundfish fishery. This does not mean that the typical species that compose the groundfish complex are not an important resource (locals hold 67 active MGF permits). Rather, it reflects adaptability in seasonal stock utilisation. This adaptability is attuned to the mixing of mid Atlantic and New England marine eco-zones.

The Sound off of Point Judith was said to be fished out of groundfish some ten years ago, but fishermen still bring in valuable catches as they range out to Block Island and beyond. Lobster is also an

important local fishery. The lobster and shellfish fishermen were severely impacted by the recent oil spill off of Cape North, Rhode Island. Oil spread in Block Island Sound and nearby waters. Closure of these waters and the death of millions of lobsters and shellfish have had a severe local impact. Lobster fishers have been forced to discard polluted traps, fish outside traditional areas, and discard lobsters that have any signs of being polluted.

The spill has also driven some fishers resorted to docking in Newport and fishing in areas they would normally not go to. The greatest impact on the oil spill has been on the lobster fishers, although area closures have also near-shore areas fished by inshore bottom trawlers. Areas closest to the spill zone (near-shore extending to within three miles of Block Island) are still closed to commercial fishing.

In a telephone survey, the total number of suppliers of fisheries equipment was noted as eleven, with 32 wholesale fish and seafood buyers, four seafood brokers, and two packers. Fish product from Point Judith has the reputation for being fresh and of high quality. It brings good prices in major markets. However, recent flooding of fish markets with Russian, Canadian, and European fish products has driven down dockside prices of domestic product. The result is that valuable fish such as grey sole are being bought at USD .10 a pound (key respondents, Point Judith and New Bedford), far below their retail value to consumers and far below a break even price for domestic groundfish fishers. Imported fish has few restrictions, and local fishers such as those in the MGF are forced to deal with occasional floods of foreign product that turn otherwise productive fishing trips into net-loss activities ('brokers').

The Point Judith fisheries have been dominated by otter-trawl dragging and lobsterpot fishing, which together regularly make up 90–95% of the catch.

E3. The Local Fleet and Fisheries

The fleet in Point Judith is very unlike those in Gloucester and New Bedford, and most similar to the Chatham fishing fleet. It differs from Chatham in having an offshore fleet (17 compared with none for Chatham). The industry and the local fisher families, with the possible exception of lobster fishers and shellfishers victimised by the Cape North oil spill, are under less stress than those in ports such as Gloucester and New Bedford. Adaptability is a trademark of the Point Judith fleet, and local respondents say they have enjoyed six successful consecutive fishing seasons. As a major gear supplier notes:

“The fishermen have had the best year they have had in a long time last year—and that’s true in both the Gulf of Maine and south of Cape Cod. It’s not true in the traditional New Bedford, Gloucester, and Boston fisheries. But the other fisheries—the Mid-Atlantic fisheries—have grown, and good fishermen in the Gulf of Maine have had a good year despite reduced effort. An I think a lot of fishermen are optimistic for the future. They see things coming along much faster than management, I think, sees them coming.”

Like Chatham, Point Judith fishers have the capacity and willingness to innovate and spread their efforts across different gear types and fishery stocks (key respondent, local fishing community leader). For example, recent increases in local landings result from targeting herring, which involves a gear conversion costing USD 125 000. Such success and economic flexibility is mirrored in a fleet that is fairly modern and in good repair.

The number of commercial vessels in port is 134. Vessels range from 45–90 feet, with most being ground trawlers. Of these, 55 are between 45 and 75 feet, and 17 over 75 feet. The smaller vessels have 1–2 person crews, with larger vessels manned by 4–5 crew. Most larger vessels fish for squid, herring and whiting. Some smaller inshore boats are still targeting groundfish, but no boats over 70 feet are. More groundfishing is actually done by the small fleet fishing out of Newport than out of Point Judith.

Some larger vessels from Gloucester and other ports may join the local fleet. One fisher from Gloucester recently fished for squid off of Rhode Island. His motivation was to establish a history in the squid fishery (a form of future “fishing investment”), although he actually lost money on the initial venture.

The captain of the one eastern side trawler still in operation fishes south past Montauk and north to New Bedford. He described his fishing strategy as “opportunistic” (you market what you can catch). For example, recent catches have included skate, which are salted in barrels and sold as lobster bait.

As in Gloucester, there is an external market for seafood products, including processing of non-local seafood products. For example, the Mitsubishi Corporation has an arrangement with Sea Fresh Corporation. Mitsubishi Fresh, Inc. contracts 16 Taiwanese longliners to fish for big-eye and yellowfin tuna off of Brazil and Trinidad. These vessels stay out for six months at a time, unloading their catch onto carrier vessels in exchange for fuel and food, and then return to Trinidad where the main plant is located. Fish are handled and shipped from Trinidad to Miami and New York for distribution in the US markets. Most of the harvest is sold domestically. All sales and business are conducted out of Narragansett. The involvement of foreign investors in local Seafood processing is a pattern that is beginning repeated in many ports. Processing of foreign fish products is an important economic activity in both New Bedford and Gloucester, the core ports of the MGF.

E4. Demographics

The original inhabitants of the region where Algonquin Indians, who hunted, trapped and cultivated until being replaced by European colonists. Indian displacement began with the Pettaquamscutt Purchase in 1658, followed by other transactions in 1660 and 1662. White settlers practised agriculture using slaves and indentured servants for the next 200 years. The industrial sector boomed in the early 1800s with the growth of textile mills, while the agricultural sector experienced declines with gentrification of the area and shifts in labour to mill jobs. Details of demographic transition and economic history from these early years up to 1970 can be found in Poggie and Gersuny (1978). The primary trend has been towards an increase in the services sector away from primary and secondary sectors. In 1970, only 1.1% of workers were engaged in agriculture (93 people), 903 in manufacturing (including 244 in textiles), 24.2% in material goods-producing occupations, with the majority (74.7%) involved in various professional, white collar, and service pursuits.

As of 1996, the labour force remains skewed towards the service industry, with fishermen numbers remaining fairly constant. Few new fishers are coming into the industry from local communities, but sons of fishers are inheriting operating vessels and permits (key respondent, Point Judith). Tourism has also become a competing industry, as described below. Although fishers are holding their own, access to prime docking space and? Social space’ is being lost to tourism development.

Table 17 gives employment figures for South Kingston, Rhode Island, which includes Point Judith and Narragansett, for the years 1984 and 1994. Figures given for fishing/agriculture/forestry are deceiving, for many participants in the fishery may serve as crew on a part time basis, or live outside the area and commute in, as they do in the processing sector. Overall, there is a 14% drop in employment in the agriculture/forestry/fishing category. In all other occupational categories, a% increase is apparent.

Table 17. Employment Figures for South Kingston, Rhode Island, 1984 and 1994

Employment Category	1984	1994	Change 84-94	% change 84-94
Agriculture/Forestry/Fisheries	196	168	-28	-14.29%
Construction	97	215	118	121.65%
Manufacturing	781	1 438	657	84.12%
Transportation/Communication	132	355	223	168.94%
Wholesale Trade	47	102	55	117.02%
Retail Trade	1 834	2 027	193	10.52%
Finance/Insurance/Real Estate	132	355	108	81.82%
Service Industries	1 803	2 581	778	43.15%
Total Employed	8 530	11 696	3 166	37.12%

Source: Rhode Island Economic Development Corporation, Providence.

Most fishermen from this port live in a 20-mile (32-kilometre) radius. There is little residential housing in the immediate vicinity. Thus, there is no communal enclave of fishermen residences, and fishing families are scattered throughout the small local communities of Southern Rhode Island, including Snug Harbour, Wakefield, and Narragansett. Although Point Judith does have a tradition in the fisheries, most of the people here have little family connections to the fishing industry. The typical Point Judith fisher is around 40 years old, has college or masters degrees, and came into the fisheries during the 1960s primarily for the lifestyle and financial independence afforded by the occupation.

The majority of fishers are first generation and lack historical ties to the industry. There is also little ethnic diversity in a population characterised as highly adaptive: “These fishermen are mostly Yankee.. they change. The more ethnically rooted a fishing community is, the more difficult it is for them to change. There is a good side to lack of tradition.”

The overwhelming majority of fishers are white males. Older fishermen refer to themselves as “Swamp Yankees.” On the other hand, a majority of fish processing workers are ethnic minorities. The former Coop contracts a company to bus in Asians and Puerto Ricans from Providence to work in the fish houses.

E5. Fishing Organisations and Associations

Several local organisations represent fishermen and their issues. Until 1994, the Point Judith Fisherman’s Coop was a viable organisation, which provided marketing support to members. The marketing-purchasing organisation of the Coop made it “one of the most effective fishing co-operatives in the United States. Overcapitalisation has been cited as the major factor in the failure of the co-operative, but other conditions such as poor prices and market conditions could have contributed to its demise (key respondent, Point Judith). The Coop has been purchased, and is now run as an independent fish-marketing organisation.

An important fishing organisation based out of Point Judith is the East Coast Fisheries Federation (ECFF). It is mainly a large boat organisation extending from New Bedford to New Jersey. ECFF is partially supported by funding from local processors, and functions to keep fishers abreast of important management issues. Funds are taken from fuel costs, with USD 0.003 from every gallon going to the organisation, which ensures its existence even if there is a lack of interest.

According to the organisation president “most fishermen are issue orientated when it comes to joining organisations ... so when the crisis is handled, the organisation usually goes down the drain. Because there is a no hassle membership subscription with our organisation, these vessels are ensured consistent representation and information from the stability of the organisation funds.” The president claims he has never lost a member by default and sees a continuing solid base of participation.

E6. Adaptability and Critical Issues

Of all the ports surveyed, Point Judith is the least dependent on the MGF. Portland has fewer active MGF permits (56), but lacks the diversity in fishing strategies seen in Point Judith. This lack of dependency is not due to a lack of interest in groundfish stocks. Rather, it is an adaptive response to take advantage of the diversity of stocks available in the region. Fishers have consistently followed a strategy that allows them to respond to changes in stock biomass and seasonality. They are not locked into utilising groundfish, but depend instead on a mix of mid-water species such as whiting and herring, groundfish species, and others such as shrimp, squid, and lobster. The primary issues in this port are distilled from interviews with key informants as the most often mentioned critical issues. They reflect the focus and concern on of Point Judith fishers in maintaining flexibility and adaptability:

- Being able to change fisheries, versatility, but dampened by the hassle of numerous new permits for the different fisheries not knowing the control dates until after the fact.
- Being on the margins of management decision making.
- Restrictions on the mesh size you can have onboard your vessel with what fish, the need to for these fisheries to be able to switch mesh sizes mid-tow.
- Gear conflict offshore between draggers and offshore lobster pots as well as inshore between draggers and gillnetters.
- Fear of ITQs.
- Positive attitudes towards the buyout programme.
- Inability to improve your business by increasing your vessel size and/or horsepower.
- Distrust of the political process of developing FMPs (see text box).
- Discouragement at the time lapse between the gathering of scientific data and the proper use of that data (see text box).
- Insulted by the way they are perceived and publicly portrayed by fishery scientists (no perceived respect for their knowledge or experience as fishers by those managing the resource) (see text box).
- Pollution impacts on near-shore waters.
- Interference in commercial fishing by the developing tourist (recreational boating) sectors.
- Including loss of dock space for near-shore draggers.

- Poor prices because of the influx of foreign fisheries products driving down ex-vessel value of domestic fresh-caught fish.
- No control over the marketing end of the industry (loss of any control over prices when the Coop went bankrupt).

The development of tourism in south Kingston and a focus on offshore trawling has also created problems for the few inshore draggers who wish to continue groundfishing. Dock space is expensive, and supporting commercial infrastructure cannot be expanded upon, since it is in competition with a growing recreational boat sector. The trend has been towards consolidation of infrastructure and loss of ‘social’ space as the surrounding area becomes gentrified.

The kinds of impacts being felt by families of large draggers in places such as new Bedford and Gloucester is not apparent in Point Judith. Fishers are still under stress because of the constantly changing regulatory climate, but appear to be coping by maintaining flexible fishing strategies. The oil spill has also stressed local fishing families, particularly those that rely on shellfishing and lobstering for all or part of their fishing income (Dyer and Burroughs 1996).

Box 8. Management and Fisheries Information—A Fisher’s Perspective:

Interviewer: “Do you think that fishermen have knowledge about the resources that are important to the fishery itself?”

Fisher: “Nobody knows better than the fishermen, nobody, without a doubt. For the amount of time that they put out there, there’s nobody that has a better idea of what’s happening within the fisheries than the fishermen themselves.”

Interviewer: “And do you think that information is actually utilised?”

Fisher: “I don’t know how much, because I know a lot of it’s based on their own surveys. The National Marine Fisheries Service conducts their own surveys, and all their numbers come from their own surveys. Probably more so than using information from the fishermen. But that all gets twisted and the information they get from the fishermen because of the politics involved, because everybody’s trying to work things to their own advantage.”

Interviewer: “So is there mistrust, do you think as far as the processes are involved?”

Fisher: “Oh yeah, absolutely. I guess that a lot of times the information that the National Marine Fisheries Service uses for their surveys is really off track, because of the limited amount of time and their methods—just not enough there to come up with accurate numbers to base management on. And then with the politics that come into play between the different use groups and the different fishermen, things get distorted that way. So I guess, yeah, there is mistrust in the whole process.”

E7. Adaptations and Adjustments to Crisis

As in all of the primary ports surveyed, there is no evidence that the industry is replicating itself or expanding through the introduction of new vessels and support businesses. However, Point Judith fishers are, overall, being able to sustain their level of social yield in the fishery by maintaining a great degree of adaptability to changing regulatory and economic conditions.

The social reproduction of the fishery follows a father-son progression, and fishers are related to each other patrilineally. Even though the history of commercial fishing is short, the kinship ties of fishers in this area are long-standing. Poggie and Gersuny (1978) found that 51% of fishermen active in 1971 had surnames found in the 1774 colonial census of the town, as contrasted with 28% of textile workers. This is predicted by the Natural Resource Community model, in which relationships to utilisation of local resources, whether they be extracted through commercial fishing, farming, or for subsistence purposes, tie individuals to a location through the social and cultural value of a renewable natural resource extraction lifestyle.

Within the sample of fishermen there was some variation; 57% of lobstermen and 47% of trawlermen have surnames found in the colonial census (Census of Rhode Island 1969: 84ff). From the 1971 sample, 73% of fishers said they had one or more of their relatives in fishing, while only 16% reported one or more of their wife's relatives in fishing.

In 1978, among 116 members of the fishing co-operative, 18 surnames accounted for 47% of the members, while one family name, represented by three or more fishers each, accounted for 32% of the members. Thus, patrilineal kinship ties have defined the social and occupational networks of local fishers for generations. A recent dockside intercept survey of seven boat captains found them working with a son and/or one other male relative as part of the crew.

One significant change is that women are involved more as crew a dockside support than they have been in the past, with at least one woman boat owner in the port. Another difference with the present fishing populations from the early 1970s is that there has been an influx of first time fishers from URI and nearby communities that have no family history in the industry, and got into fishing because it was an available option. Present recruitment, however, is at a standstill as limits on permits, well-established occupational networks, and high start-up costs inhibit new entrants to the fishery.

Other issues include gear conflicts, area restrictions, and competition for resources with the recreational sector. Social conflicts noted by Poggie and Gersuny in 1978 have only worsened since, and their description is apt:

“Although they are circumspect in talking about them, commercial fishermen also have to contend with sports fishermen and pleasure boating enthusiasts as competitors in the social environment. Inshore pot lobstermen in particular view these groups as their enemies, as human predators who interfere with their livelihood. Pleasure boaters frequently violate the rules of the road and damage fishing gear, as well as compete for scarce dock space” (1978:48).

Box 9. Portrait of an Inshore Dragger: Critical Issues

“Frank” is an inshore dragger. He lives in South Kingston, but fishes out of Newport. He feels that the port of Galilee (Point Judith) caters more to offshore vessels, and this is one reason for the decline in the local inshore groundfish fleet (and his decision to change his docking location). He is also concerned about diminishing fishing areas, having one of the largest inshore draggers at 70’ and depending on being able to catch a mix trawl. First, the grounds of Nantucket Sound have been denied him through Massachusetts legislation favouring smaller MA draggers targeting the same species, primarily groundfish and fluke. This forced the fleet to move closer to RI shores. Because the area, especially around Block Island, is so limited his tows must follow a certain line (there are many well-recorded obstacles along this line that make shortened tow times necessary). Over the years, other gear types, such as gillnets and lobster pots have increased in this limited area. He and other draggers have attempted to reach resolution on competition with these fishers, but have been unsuccessful. Many of the gillnetters are from other ports, such as New Bedford, and cannot be easily contacted.

Frank has a wife and two children, and is committed to the fishing lifestyle. As with many local RI fishers, Frank does not have a traditional family fishing history. He went to school at URI and got into fishing by doing it part time in the summers. Despite problems limiting his effort, he feels fishing can continue to provide for him and his family. He has no plans to leave the industry, although his wife is taking classes so she can contribute to the household.

E8. Conclusions

Fishers of Point Judith are maintaining their economic viability by taking advantage of a good mix of mid and north Atlantic fish stocks, and by maintaining diversity in seasonal fishing patterns, gear types, and permits held. The result is a relatively economically healthy fishing fleet, but with few new recruits and no new vessels coming into the system. Ties to international markets have kept the inshore processing sector viable even with the declines in groundfish landings. Offshore midwater draggers have also made up for local declines in groundfish landing by targeting high biomass midwater species such as whiting, herring and squid. The immediate future of the fishery in Point Judith looks good, but the lack of recruitment and loss of social and cultural capital through gentrification prevents the industry from expanding, and could accelerate its decline if gentrification intensifies. There is evidence that this is occurring, since the south Kingston area is experiencing a population growth due to high quality of living and benefits of a good school system, which is driving rapid land development (Rhode Island Economic Development Corporation). As values of local dock space and land increase, further declines in fishing infrastructure may follow.

IV. Secondary Ports

A. Secondary Ports in Maine: Stonington and Down East

We noted earlier that one of the principal changes that occurred in the Maine MGF following the opening of the PFE was the consolidation of the fleet around Portland between 1987 and today. This has been paralleled by a steady decline in the number of fishermen engaged in gillnetting for groundfish and, among those who continue to groundfish, a decline in the amount of fishing effort individual fishermen devote to ground fishing. The smaller ports north and east of Portland are at once more dependent on

fishing for the overall health of the community and less dependent specifically on ground fishing than fishermen in and around Portland. Most of the ports of the Down East region of Maine are physically isolated, located along or at the ends of long dead end roads and more easily accessible by water than by land.

Tourist infrastructures remain at incipient levels of development, unlike the small coastal communities south of Portland, and local economic alternatives remain confined to forestry and fishing and the services that supply these industries and those employed in these industries. Generally, tourist infrastructure consists of a handful of bed-and-breakfast establishments, a few restaurants, an art gallery here and there, and one or two gift shops and book stores. Constraints to developing tourism derive from ecological and cultural sources. Many of these towns have been well integrated into local forest and rocky environments, with little space available for developing tourism further without destroying the very aesthetics that attract tourists to these coastal towns in the first place.

Many long-time residents of coastal towns, particularly those in the fishing industry, oppose tourism on the grounds that real estate development compete with fishing for coastal access and increases the volume of foot traffic along the waterfront. Those who suggest tourism as an alternative to commercial fishing, in any case, ignore several features of tourist development. The just noted competition between commercial and recreational uses of the coast predisposes commercial fishers against moving into the leisure sector; indeed, established social ties to the leisure sector, strengthened by the solidarity that has emerged from past conflicts with commercial fishermen, may prevent commercial fishermen from the support they require to establish tourist-related businesses. Further, tourist development often quite rapidly begins duplicating services. Finally, most of the jobs in tourism for those who do not own businesses are part-time and low-wage jobs.

Most coastal Maine fishing communities are similar in appearance. They range in size from under 1 000 to around 5 000, although most have populations of under 1 500. Stonington, for example, has a population of around 700, at least 40% of whom are either lobstermen or other kind of fishermen (locals estimated a lobstering population of 300), and most of the remaining year-round residents engaged in services that cater to fishermen. During the summer months, of course, populations in most of these coastal towns increase with seasonal residents (Acheson 1987). Increases in summer time activity coincides with increased commercial fishing and an increase in employment. Figures compiled by the Maine Department of Labour, for example, find that unemployment rates in these regions drop to their lowest levels, usually, during the months of July and August (Table 18).

Table 18. Labour Force Statistics for down East Portions of Maine, 1994

Labour Market Area	Total Labour Force	Ave UE Rate	Rate at Low Month
Boothbay Harbour	7 960	5.6%	2.3% in July
Buckport	4 960	7.7%	4.9% in July
Ellsworth-Bar Harbour	19 230	8.3%	3.4% in July
Jonesport-Milbridge	3 550	12.4%	8.1% in July
Machias-Eastport	6 360	12.0%	9.6% in July, August
Stonington	5 030	5.5%	2.7% in August, Oct

These figures show us, first, that some of these coastal regions, particularly those further from Portland (Jonesport and Machias) experience relatively high rates of unemployment even during the summer months. This indicated the few alternative employment opportunities outside those tied to forestry and fishing, both predominantly summertime operations.

Often hilly, neighbourhoods of coastal Maine towns consist of small frame homes, and very occasionally a trailer or two, interspersed among colonial mansions and larger homes. These neighbourhoods seem to slope down to the waterfronts, where the densest clusters of businesses and houses stand. Immediately upon entering a coastal town you perceive fishing iconography: ancient wooden captains' steering wheels and capstans, lobster pots, statues of lobsters and plaques with mounted cod outside municipal offices. Nets, buoys, lobster traps and vessels clutter the yards of nearly every house. Approaching the harbour, the orientation of the townsfolk toward water becomes especially obvious. Trap and net manufacturers, marine supply stores, fishing co-operatives and marketing operations compete for shoreline with whale-watching firms and transport vessels. Usually one or more municipal piers or private docks extend out into the water, rigged with fish and shellfish buying facilities that are barn-like in appearance. Perpendicular to the main length of the pier are often smaller lengths of floating piers for tying up the 14' to 20' (4 to 6 metre) craft that fishers use to move between land and their fishing vessels; the fishing vessels themselves are moored, off shore, at moorings throughout the harbour.

The ports east and north of Ellsworth and Bar Harbour, including Winter Harbour, Jonesport, and Machiasport, specialise in lobster, sea urchins, and winter dragging for scallops; the infrastructure is designed to land these species. Vessels have been outfitted with ironwork triangles to handle winches for hauling lobster traps or for the scallop rigs. Sea urchins, a relatively new fishery, are harvested primarily by divers, and a few gillnetters in each of these communities land flounder and other groundfish during the summer. Their numbers are dwindling. Licensing data becomes dated relatively quickly, even after three or four years; the Maine Marine Patrolman based outside Ellsworth said, "It [the fishery] changes every year."

A1. Machiasport

This is a small, rambling community, with a firm beach of stone pebbles and a sheltered harbour where several of the lobstermen store and launch their boats. It is a deep-water port that currently aids the salmon farming and processing in town. A single factory operates through most of the year, providing a low level of employment to the town. There is little other industry beyond this.

This port is dispersed and spread out, with smaller boats that are trailered behind pick-up trucks and stored primarily at the fishers' homes. The pots are also stored at the homes of the fishers, unlike the other ports, where pots are clustered at co-operatives and fish dealers. Most of the fishing vessels are small, for targeting lobster, generally under or around 45' (13.7 metres) in length.

Two lobster fishermen at Buck's Harbour, just east or south of Machiasport, who said that there were a few gillnetters in this area and in Jonesport during the summer, but that the only dragger during the winter usually targeted scallops. There is no large ground fishing fleet in this area.

A2. Jonesport

Seemingly more densely populated than Machiasport, this port receives shelter, in part, from Beals Island. This is a fairly densely populated hamlet, with several sheltered facilities, including a long jetty. We visited on a February day and counted 38 boats moored out in the water, away from shore, between a large metal structure and the pier. Another 16 and another 5 in other places inside the harbour. There are at least four sheltered areas with clusters of boats.

Across from Jonesport, connected to the main point by a short bridge, is Beals Island—clearly a lobstering island, with lots of traps, a couple of boat builders, and a few other marine-related businesses, including the following: Great Mass Seafood (Beals Island); Richard's Boatshop; Osmond's Boat Shop; Stan's wire trap shop. At a fishing co-operative four fishermen unloading sea urchins reported that there were, perhaps, six gillnetters in this area, but that most of the gillnetters had been driven into other fisheries, principally scalloping and diving for urchins, because of marine mammal legislation.

A3. Southwest Harbour

Close to Acadia National Park, this community contains much more tourism infrastructure than the other ports, yet it was here that there was a recent controversy surrounding a whale watching firm: later, a Portland told me that in this case it was more of an access issue, that there was much vehement opposition to the whale watching coming in because they would take up too much of already precious harbour space. Conflicts such as this, of course, would hinder an easy transition into tourism.

Two fishermen at a scallop/lobster buying station reported that there was only one fish dragger left in Southwest Harbour and another in nearby Bar Harbour. Both groundfish from medium sized vessels. Most of the fishermen here rely on summer lobstering and winter scalloping. Scalloping season begins in November and runs through April; lobstering begins in March or so, and runs through to November. Fishermen can catch lobster during the winter, but run the risk of having their traps dragged up by scallopers. This prevents lobstering except in areas where scallops will not drag because the substrates would damage their nets. Dealers here reported that those fished for lobster during the wintertime placed traps on rocky ledges, where scallopers won't drag.

The vessels that do drag for fish around here are not going as far as Georges Banks; they are more closer to shore draggers. The fishermen interviewed here, as in other ports, told me that the regulations had already dismantled much of the gillnetting portion of the groundfish fleet, and they had switched to other fisheries. One of these, of course, was sea urchins. In particular, lobstermen who used to rig their boats with "gallows," a rig that could make a lobster vessel a dragger, now have got into diving (dry suits, mainly) for urchins. They only drag for urchins where tides are too strong to dive, but this is viewed as ecologically destructive.

A4. Stonington

Of all the ports visited between Machiasport and Rockland, the most obvious gillnetter's harbour was Stonington. In Stonington live the past and current presidents of the Maine Gillnetters' Association, and the port is home to Commercial Fishing News, a monthly publication dedicated to fishing issues. Its former editor is currently the Commissioner of Marine Fisheries. The port is a principal lobster-landing centre with some scallopers, urchin divers, and ground fishermen who utilise gill nets. No big rollers with nets adorn boats in Stonington's harbour, but several gillnets remain piled on a dock in the centre of town. Physically, Stonington sits at the end of a long dead-end road. The village slopes downward to cradle the

harbour. Three large piers—one a recently built public pier for off-loading fish—jut out into the harbour and marine related businesses cluster at the land ends of these docks. There are some indications that the port has been shifting away from its emphasis on fishing, yet without any clear direction as to what, exactly, will take fishing place. According to a local fisherman, in recent years the port has lost a hardware store, a clothing store, a drug store, and two welders, which were replaced by two art galleries and two souvenir shops.

The groundfishermen of Stonington have already suffered severely from regulatory changes associated with Amendments No. 5 and No. 7, as well as marine mammal legislation issues. Changes taking place over the past few years chronicle a fleet that has not only shrunk in size but has struggled with alternative fisheries, attempting to move into the already crowded lobster industry in particular as well as other fisheries such as tuna and urchin diving. Before 1995, there were seven or eight draggers operating in Stonington and another five operating in nearby Bar Harbour, with upwards of 42 gillnetters between Stonington and Machiasport. Over the past two seasons, however, these figures have fallen to one dragger operating out of Stonington, along with 18 gillnetters.

Gillnetting for groundfish used to be primarily a summertime activity, lasting from May to October and thus overlapping with the lobster season. Typically, the fishermen would leave the port in the evening, set their nets between midnight and 2:00 am, and pull them up the following evening around the same time. They typically operated from 30' to 40' (9 to 12 metres) vessels, using 3- to 4-man crews. As in Gloucester, crew sizes have shrunk with the restrictions on times and areas, and crews now are more likely to be 3 than 4. During the winter, gillnetters, traditionally, would scallop or shrimp, but the bulk of their income came from groundfish.

As in other ports, Stonington fishermen are having trouble recruiting crew who are willing to fish day in, day out, through the heavy fishing season. Only the lobster fishery is reproducing itself at a healthy pace, with ground fishing crew working a few days at a time and then laying off after being paid, unwilling to take the business seriously because of negative perceptions concerning its future.

Marketing of fish is conducted at the municipal pier, but is dominated by two men, one who buys and another who trucks the catch to more distant markets. According to a local fisherman's wife, all of the fish landed in Stonington is trucked to Nagels Seafood in Boston. Because of infrastructure limitations—the dead-end road mentioned earlier—locals' view marketing as a primary problem.

In adjusting to changes, fishermen have moved into the winter urchin fishery as well as experimented with other fisheries. There are few alternative occupations in a place like Stonington outside of fishing, and the retraining centre established there has toyed with aquaculture and other alternatives without much success. Because of concerns about crowding in the lobster industry, groundfishermen fear that they will not have the history to enter the lobster industry, especially given recent zoning proposals before Maine lobstermen. This model, currently being considered for the lobster industry, may well serve as a model for community based fishery management in other fisheries (James Wilson, personal communication). It consists of the following:

- First, Maine recognises regional distinctions between fisheries based on historical and ecological characteristics. These regions reflect groups of fishermen who are similarly placed with regard to their interactions with the marine resources. That is, they practice similar mixes of gears and target species and have, historically, interacted with fishermen from other communities within the zones, to define, protect, and defend their territories (Acheson 1987).
- Maine recognises five zones. Each of these zones has its own regional council who are elected for three-year, staggered terms through a process that involves a) identifying stakeholders with current

licensing data; b) voting in annual elections. The number of council members varies by the size of the zone, with council members representing 100 or fewer license holders.

- Each regional council develops proposals for changes in fishing rules, which are then voted on by all fishermen in the zone. Changing any fishing rule requires that two-thirds of region's fishermen agree on the change. Rules that are decided upon by regional councils include those governing numbers and types of gear and time regulations (seasons, numbers of days one can fish, etc.). The zone model allows for sub-zones to exist within zones for finer regulations that recognise more localised circumstances.
- Perhaps most important, the Maine model is one of participatory co-management, with state entities—specifically, the Marine Fisheries Commission and the Department of Marine Resources—and fishing interests coming together to develop proposals for changes in fishing regulations. This consists, essentially, of a “bottom-up” meets “top-down” model in which lines of communication between the state and fishing groups, and among fishing groups, have become institutionalised.
- Fishermen can fish in more than one zone, but must abide by the most restrictive zone's regulations. This solves problems of fishermen from different communities coming into distant waters with gears and fishing methods that local fishermen deem destructive to the resource.
- Because these councils, if instituted, will establish terms of fishing in each zone, Stonington groundfishermen fear that they may be discriminated against when attempting to apply for lobstering licenses or to increase their lobstering efforts. In any case, the proposed establishment of zones and regional councils is an indication that entry into the lobstering industry, historically highly territorial, will be even more difficult to enter in the future.

B. Portsmouth, New Hampshire and Southern Maine ports

Despite its seemingly ideal location between the southern coast of Maine and Gloucester, Portsmouth is neither a large MGF port nor a great centre of commercial fishing activity. Much of the city's commercial fishing activity is based across the river from Portsmouth, in Kittery, Maine, and consists primarily of lobster vessels. Development in Portsmouth has emphasised commercial uses of the port that do not necessarily involve commercial fishing, including shipbuilding and international trade. Along its waterfront are several restaurants and historic monuments that reveal a recent emphasis on tourism—particularly heritage tourism—but a large commercial fleet with active off-loading facilities is not prominent in these activities. Our efforts to survey seafood dealers and processors in Portsmouth about groundfishing met with little interests and less success, indicating that the MGF has no substantial presence there.

Portsmouth and the ports between Portland and Portsmouth, along the southern coast of Maine, are more obviously centres of tourist development than centres of commercial fishing. Ports such as Ogunquit and Kennebunkport still maintain their lobster fleets as essential to their character, but those few groundfishermen who moor their vessels among the smaller vessels land their fish primarily in Portland, at the display auction, as was discussed in detail in the section on Portland.

C. Provincetown, Massachusetts

C1. Overview of the Port

Provincetown (known by locals as “P’Town”) is a historic port with the second deepest harbour in the United States. Unlike Point Judith, the fishing fleet of P’Town has concentrate its efforts on dragging, and has not significantly diversified into other fisheries. The majority of the fleet are eastern otter trawlers, complemented by a small fleet of inshore angling vessels. A total of 18 vessels were counted at the docks, with their numbers equally divided between steel and wooden hull vessels.

The importance of fishing to historic P’Town is reflected in murals in the town hall showing fishers bringing in the catch. Provincetown once had a booming fleet that took advantage of its proximity to local fishing grounds to catch large quantities of groundfish. Fish were processed and shipped to Boston and other markets and a thriving processing sector dominated the local docks. About 15 years ago, local respondents report that the industry began to experience a downturn as nearby fish stocks were depleted and area closures such as Stellwagon Bank limited the opportunities to fish near shore.

Another disadvantage of P’Town is its geographic location. Although it has the second deepest natural harbour in the world, being at the northernmost tip of Cape Cod has made it distance from major fish markets has made it difficult to compete with ports having better access to ground transportation such as New Bedford and Gloucester. In the summer time, the one road going into an out of P’Town on Cape Cod is regularly clogged with tourist vehicles on their way to visiting the beaches or travelling to the art and tourists shops that have come to dominant the P’Town economic landscape. In the wintertime, bad storms can close down the one road making regular access difficult. Processing plants closed down and the traditional fishing fleet aged while gentrification drove the economy towards tourism:

“It used to be real wild around here. Fishermen had bars to celebrate in and small grocery stores where you could buy supplies on credit. That is all gone now. Now it is all regulated and full of tourists. Fishermen don’t matter that much anymore.”

Original fishers of P’Town were English and Scottish immigrants, eventually replaced by Portuguese immigrants who came to dominate the fishing industry. Extended Portuguese families worked in occupational enclaves based on 6-7 person crews. They didn’t significantly diversify their economic activities and thus remained somewhat culturally and linguistically isolated from other residents. Migration between P’Town and Portugal, as with the fishers in New Bedford, was common. Many of the more successful fishers left P’Town over the last 25 years to join the fleet in New Bedford. They were replaced by newer immigrants who would take over ageing vessels and “have a go at it.” However, others stayed and have fished out of P’Town for up to 40 years (key respondent, elder fisher). Because of the out-migration of highliners, and the ethnic insularity of the fleet, there was really no impetus (or significant capital) to diversify fishing strategies (key respondent). Those coming into the fishery took up with what was available, and had little motivation to change.

C2. The Infrastructure and the Fleet

The town pier has two large docks that extend for approximately 300 yards. The construction is wood and cement and is sturdy enough for 18-wheeler truck traffic. At the end of the pier are two fish suppliers: Oceanic Seafood and Whaling City Seafoods. The docks are in good condition, and the Chamber of Commerce has been actively promoting the quality of the harbour for berthing of large offshore (foreign) vessels. The end of the pier is dominated by restaurants and local shops, but there is little evidence of businesses dependent on the fishing industry.

Provincetown has the most dilapidated fleet of any MGF port. Most of the vessels observed (13 out of 18) were old eastern rigged otter trawlers. Half of the fleet were of wood construction, while the other half consisted of rusty steel vessels. The fleet is a combination of scallopers and otter trawls ranging from 45 to 68 feet (13.7 to 20.7 metres) in length. The otter trawlers have from 2–6 crew, while the scallopers have crews up to seven (NMFS regulations prohibit more than seven crewmembers on scallopers). The isolation of Provincetown insures that all fishing families live in local residences. Some of these families are having difficulties with their mortgages as they struggle to survive in the fishery. As in New Bedford, some of those in economic stress have returned to Portugal. The condition of the fleet is summed up by a welder who has worked on them for many years:

“The boats are in very dangerous condition. They don’t have the money to fix things—to take care of the electrolysis problem—so they just paint over it. There are some boats I wouldn’t go out in, or even work on now. I was in one boat the other day and they had painted over some rusty pipes. Now, the pipes looked new, but when I put my hand on one, it broke off. It was pure rust. Those boats are not fit to go out in, but they are out there fishing, risking their lives because they have no choice.”

The age and condition of the vessels is the primary difficulty facing local fishers. Over 95% of vessels have no insurance and many are unsafe to be on the water (key respondent, Assistant Harbour Master). Over the last five years the Assistant Harbour Master claims many vessels have sunk, some of them right at the dock. Sunken dockside derelicts have been refloated and reused if not sold outright. Of 28 draggers/scalloper vessels on the Harbour Master list, three have been sold and one is up for sale. Because fishing has been so poor, and regulations so restrictive, fishers can only afford to fix the most pressing repairs, ignoring others which could be life-threatening on an extended fishing expedition. The condition of the fleet has thus cut into the trawl time of the more problematic vessels. Captains are afraid to venture far from shore for extended periods because of the threat of sinking.

The nearest fishing ground is Stellwagon Bank, which has been “fished out” for years. Also, the Provincetown fleet must compete for Stellwagon fish with the North shore fleets of Boston and Gloucester. This competition forced P-town vessels further and further off shore, but because of the continuing declining condition of the vessels, they can no longer risk going far, especially in marginal weather.

Besides the 28 larger listed vessels, there are 19 smaller jig boats. Of these, 15 are longliners, two gillnetters, and two lobsterpot fishing. Currently, only 17 of the 28 vessels are in working condition. The smaller boats are in better financial shape, since they are less costly, but also since they are not expected to provide direct support for more than 1–2 fishers and their families. However, all vessels and fishing families are marginalised in a fishing community that is experiencing the worst possible combination of marketing, fish stock, and production capital losses. P’town is the epitome of what can go wrong in a port highly reliant on the MGF.

Another issue which may further impede the viability of fishing is the construction of a sewage outfall pipe from Boston’s new sewage treatment plant. The outfall pipe carries fresh water and dumps it onto Stellwagon Bank. Any hopes of rebuilding a fish or scallop stock there will be lost once the pipe is operational. One fisher of 40 years experience was very encouraged by the recent comeback of scallops on the Bank, as well as the recuperation of the local lobster population, which serves as a secondary catch on draggers. His assessment of the outfall pipe: “*It will be the end of us.*” An environmental engineer who worked on aspects of the outfall pipe remarked about its impact on the fishery: “the ecosystem will certainly be changed ... they would be dumping millions of gallons of freshwater onto the Stellwagon Bank.”

C3. Adaptations to Crisis

The major problem of the port is unemployment and underemployment of former fishers. Day-to-day survival is a struggle as fishers and their families cope with declining income (or no income) and increasing uncertainty because of fishery restrictions such as Amendment No. 7. However, given the fishing and fleet conditions, restrictions on days at sea is less of a problem now than just getting out to sea at all.

One possible avenue for fishers to improve their economic condition is through the retraining programmes begin offered by the Fishing Family Assistance Centre. The optimistic motto of the Centre is: *“Serving fisherfolks, their families, and related industry workers adjusting to changes within the fishing industry on Cape Cod, the Islands and nearby region.”*

The Chapter on Gloucester discusses critical issues that include the training centres on Cape Cod. In P’town, the primary barriers to the success of the programme are as follows:

- P’town fishers do to see the centres as an opportunity to seek a better life, but as a programme designed to take away their opportunity to earn a living fishing.
- The programme was not designed with any understanding of local fishing culture and life values.
- Ethnic and linguistic barriers exist that limit the participation of male Portuguese fishers.
- The opportunities for retraining are limited by economic opportunities in the region.

Participation in retaining has been scarce, and although the P’town retraining centre could not give exact figures, few fishers are noted to have been retrained, with the majority of those taking advantage of the programme being the wives of fishers. Opportunity issues exist even for the wives of fishers who seek retraining. As one centre worker expressed, “how many cosmetologists can you have in one town anyway?” A fisher’s wife active on the community who works at the Chamber of Commerce describes the situation as grim:

“The retraining programme is great—but where are you going to find a job? Also, people who have fished their whole life cannot just give it up to do something else. I know they are training people to be nurse's aids, but I can’t see my husband giving up fishing to do that. There are no jobs around here—I know there is nothing because I work at the chamber and I know how hard it is—there is nothing now. If you do get training, where are you going to get a job? You would have to relocate, and if you have a house and family ties here, that would be tough. This might be OK for those who can easily relocate like crewmembers—but not for captains and owners. The boat is like part of the family. For fishers like us, it is not an option to try something else. We have decided to try to ride it out, and hope things improve.”

D. Newport, Rhode Island

DI. Overview of the Port

Newport is a historical port dedicated to tourism and recreational boating but with a long and persistent commercial fishing presence. Before the development of the docking facilities at Point Judith, Newport was the centre for fishing and shipping in the State. In 1971, 57% of all commercial fisheries

landings were in Newport; but Point Judith surpassed Newport in importance by 1973, and now is the dominant commercial port in the state.

Tourism in Newport started as far back as the 1700s. Visitors included southern plantation owners who stayed in Newport to escape the heat of the summer. By the 1830s, tourist hotels began to dominate the shore side landscape. The famous “cottages” of Newport were built by industrialists seeking to outdo each other in displays of ostentatiousness. The present tourist economy is centred on year round activities with the highlights being summer and sailing events. The Americas Cup races are regularly held in the area, attesting to the importance of the pleasure boating industry.

Beside tourism, the East Bay Navy base has a major economic impact in the area. The base employs thousands of local civilians in service roles. The service industry also caters to a large retirement community. Many naval personnel familiar with the area from periods at the local War College or at the command schools select Newport for retirement. They bring money into the community as retirement pensions and contribute to the support of many service-oriented businesses as significant consumers.

The history of the fishery and its present state up to 1981 has been thoroughly described by Bort (1981). We give an overview of the fishing history and infrastructure here, and then focus on the fishery as it now exists.

Fishing has always been an integral part of the local economy, although not of the stature of tourism and other components. It does not make much sense to talk of the degree of community “dependency” on fishing in Newport, for the existing “community” could do quite well if commercial fishing disappeared altogether. A different perspective is to think of the fishing “community” as a regional contributor to the commerce of groundfish fishery, and as a means of providing support to approximately 200 families with a sustainable livelihood while they contribute a high-quality food product to the commerce of the region and nation.

During the 1700s to early 1800s, fishing was an important part of the local economy. Historical records mention fish drying stations and fisheries. The quantities of fish are not mentioned, and fisheries as an activity declined by the 1700s with the rapid development of Newport as a slave trading and shipping centre.

Whaling was practised for several decades in the 1770s, but was never as important as it was in ports such as New Bedford and Nantucket. By 1785, the whaling fleet consisted of 50 craft. However, by the late 1850s, most of the craft had either moved to New Bedford or entered other pursuits (Field 1902: 482-483).

The period from 1800 to 1930 saw the development of the indigenous (bay and inshore) fleet. Fishing effort was concentrated on groundfish stocks that could be reached in a day, fished, and then landed on the dock. Most fish, with the exception of menhaden, were taken in staked and floating fish traps and weirs. This was also the period when industrial fish was a major component of the economy. For example, in 1889 in Newport and other Rhode Island ports, fish reduction plants for menhaden, and fish drying operations for cod and other groundfish, processed 127 million pounds of fish, 89% of which were menhaden (Olsen and Stevenson 1975: 53). This fishery collapsed in the 1930s, and the fishery transitioned towards groundfish trawling. During the 1920s, marine diesel engines effectively extended the range and fishing time of commercial groundfishing vessels using otter trawls.

D2. The Infrastructure and the Fleet

Newport has one of the best natural harbours on the Northeast. It provides excellent protection from rough weather, and is deep enough to provide berthing for US naval vessels. There is only one wharf area that is presently used by fishermen. It is leased by the state by the Newport Shipyard Company. This stone filled wharf is adequate to service the 20 vessels that regularly land groundfish in Newport. In 1981, major fish buyers included Anthony's Seafood, Aquidnick Lobster Company, and Parascandolo and Sons. Anthony's is no longer in business, and Parascandolo markets all groundfish landings that come into Newport. Fish are not sold or processed locally, but ice packed in trucks to Boston, New York, New Bedford, and markets south. Decisions are made on where to ship the fish based on equitable pricing and demand. Ice is supplied to these firms by the Eastern Ice Company located in Newport. The Tallman and Mack Company, a private firm reported by Bort (1981) to operate fish traps between April and November out of Newport, is no longer in business.

Newport's groundfish fleet has dramatically declined over the last twenty years. The decline has been spurred by increasing property values restricting fishing industry infrastructure and competition with recreational vessel constricting wharf space. No new boats or new shore side fishing businesses have come into the fishery in the last twenty years. The local waters of Narragansett Bay are overfished, and near-shore grounds off the coast and nearby Block Island have experienced significant declines in groundfish. Factors forcing a decline in groundfishing are not recent, but has been ongoing for some time. In 1981, Bort writes:

“The general direction of the community's development does not bode well for the future of fishing. Neither tourists nor pleasure boaters are typically enthusiastic about sharing a harbour will commercial fishermen. The stereotypic grizzled old man hand-lining from a dory is romanticised. The modern steel trawler is viewed as a source of odour and noise and as competition for space. The fishing industry is far down on the list of economic inputs to Newport, and probably also on the community's list of priorities” (1981: 89-90).

Bort was correct in this prediction. There is still a degree of prejudice by the Newport community against commercial fishers (key respondent, Office of the Harbour Master), and the fleet has declined dramatically. In 1977, 164 boats made landings in Newport. Of these 49 were from Newport, 45 from New Bedford, and the remainder from as far north as Gloucester and as far south as Virginia (William Murphy, National Marine Fisheries Service, Newport, RI). In 1978, only 91 of these vessels had returned to Newport.

In 1996, the number of MGF permits held by Newport commercial vessels was 16, with a total of only 20 vessels landing groundfish in the port. Of these, only 2 fished in the bay, and another 2 fished in near-shore waters, with the remainder fishing 7–10 day trips on grounds north and south of Rhode Island. Using the 1981 figure of 91 vessels as a benchmark, this represents a 78% decline in commercial fishing vessels landing in Newport over a fifteen-year period. Similar declines have been reported in Gloucester and New Bedford.

The greatest decline has been in the indigenous, or bay and inshore fleet. After WW II, the indigenous Newport fleet consisted of 20 vessels. In 1981, this number was down to only eight, and in 1996, only four. Declines in near-shore stocks, pollution impacts, competition with stationary gear, and area closures have made inshore groundfishing more difficult. Overall, the Newport fleet is more dependent proportionately on groundfish than the more diversified fleet fishing out of Point Judith. All of the vessels are essentially groundfish fishing, with some having the capacity and permits to fish squid (*Loligo*) fishing as needed in order to maximising the benefit of days at sea limits.

Despite these difficulties, local fishers and fish marketers feel that the remaining fleet represents a stabilised situation:

“These guys that fish out of here, they are doing OK. They’re holding their own. Prices are down right now with all the foreign fish being shipped in, and its rough. But they’re going to make out OK and survive. When they have to, they can switch over to fishing for squid, and that gives them some flexibility” (key respondent, Newport fish marketer).

The number of fishers is estimated at 4 crew per boat, with 20 boats, giving a total captain and crew population of approximately 80 fishers. The local groundfish marketer, Parascandalo, employees 15 workers in the plant and 4 elsewhere. The operation uses twelve 18-wheelers plus five straight bed trucks. The total number of groundfish fishers and immediate support personnel comes to approximately 100 individuals and their families. This is comparable with the estimated numbers and fleet size for Montauk, NY, which had 24 vessels in operation and an estimated 100 families dependent on the industry. Unlike Montauk, with 76 MGF permits in port, there is a close match in Newport between the number of MGF permits (16) and the number of vessels that land groundfish at the port (20).

D3. *Adaptations to Crisis*

Despite the emphasis on tourism, and a noticeable decline in the commercial fishing presence, the 20 vessels of the groundfishing fleet of Newport are in good condition, and “holding their own” in this period of increasing regulation of the MGF. However, as in other ports, it does not appear that the social, economic, and cultural capital which comprise the fishery is being reproduced. MGF permit holders in Newport will eventually have to make the decision to retire their permits to or pass them on to others as vessels age and new recruits do not take up the occupation (a decline in the social yield). The questions that remains for Newport are: (1) will the community support the presence of a new generation of fishers; (2) will a support infrastructure survive to allow them to fish; and (3) will anyone be interested in joining a profession that is both dangerous and increasingly economically risky?

E. Montauk, New York

E1. *Overview of the Port*

Montauk is an isolated community at the tip of Long Island, New York. It has no major light industry or other capital generation sources besides commercial and recreational fishing and related tourist activity. Thus, we classify it as small Scale NRC. Unlike Gloucester, Montauk has never had a large commercial infrastructure dedicated to ground fishing. It is given special consideration here because the high number of reported MGF permits gave investigators the initial impression it represented a major groundfishing port.

In Montauk, Baymen originally fished for subsistence and barter using weirs and inshore seine nets. The vessel of choice was the piragua, a small sail-powered craft for fishing in near-shore bays and inlets. Shellfish fishing was also important and remains a seasonal summer activity. Although Baymen have disappeared in Montauk, some still follow this simple lifestyle in nearby Shelter Island, Snug Harbour and Freeport.

Shore seining for menhaden (“bunkers”) was an early commercial activity that supported over thirty “seine gangs” in the early 1800s. Shore gangs were replaced at the turn of the century by menhaden steamers using haul seines. Women used to play an important part in the fishery by helping out with the

beach (seining for alewives). They also worked in marketing and processing of bunkers. Bunker factories made millions for their owners, and fish were converted into fishmeal, fertiliser, and oil. Local menhaden stocks were eventually depleted, and the bunker industry lasted until 1968 when the last fish factory—the Promise Land, closed.

Despite the closure of the bunker factories and a small groundfish fleet, Montauk remains New York State's most important commercial fishing port. In 1993, offshore draggers harvested about 20% of all whiting landed by New England and Mid-Atlantic fishermen (Drummond 1995). A large portion of the catch, which also includes 10% of the *illlex* and loligo squid landings in the Northeast, is sold for export.

E2. Demographics of the Community

Commercial and recreational fishing are the primary activities in Montauk, with the community business sector being geared to servicing these two fishing sectors. The summer season is also important for tourists and summer rates for hotels and other seasonal housing reflects this. The average age for residents of Montauk is 37.9, while the number of people per square mile is 172.1. The average 1990 income was as follows:

Household	USD 31 849
Family	USD 39 292
Non-family	USD 22 417
Per capita Income	USD 20 502

As of February 1996 the total population of Montauk was 3 001 (Chamber of Commerce). Census Bureau data gives a total 1990 population of 2 813. Of these, 798 claim Irish ancestry, with other dominant groups being German (640), Italian (408), English (252), Polish (174), Russian (158), and Yugoslavian (97). There were 1 673 individuals employed over the age of 16.

There are approximately 290 residents listed in the Census Bureau report that list their occupation as "fishing". A local community leader in the recreational sector estimated that 100 resident families make their living in recreational fishing services. With 24 estimated commercial vessels averaging three crew each, there are approximately 72 families that are directly dependent on the production side of commercial fishing. This does not include those in the processing, transportation, and infrastructure support sector (*e.g.*, fish market owners/operators, dock workers, welders, fish processors, and carpenters).

E3. Seasonal Fishing Patterns

The winter community is small and insular, consisting of commercial fishermen and their families, small businesses, and local charter boat owners/operators. Some of the recreational fishers will over-winter in Montauk or nearby East Hampton. Many others will dry-dock their vessels and spend the winter months elsewhere. The height of the fishing season begins around mid-March after Saint Patrick Day, which is marked by a celebration of the rites of spring and the renewal of fishing.

Fishing is most active June to September, and least active December to February. The winter fishery targets tilefish, pollock and cod along the shelf. In the summer, a large charter boat fleet goes after tuna. Many charter boat owners/operators also hold groundfish permits. A key respondent explained that this allows them to take groundfish for personal use and for customers when tuna is scarce. Small landings of groundfish are sold to local restaurants or used for subsistence purposes.

Targeted groundfish include summer flounder (fluke), cod, pollock, and yellowtail flounder. A summer fishery for yellowfin, bluefin, and bigeye tuna is conducted by a day and charter boat fleet. The importance of the recreational sector has been steadily growing as recreational fishing pressure increases and as some commercial fishermen convert their boats for charter fishing and whale watching.

Montauk is also home of a productive tilefish fleet. Tilefish are caught during the fall and winter months by long line in deep water at the edge of the continental shelf. Montauk led the Northeast in tilefish landings in 1993 with 2 200 000 lbs. valued at USD 2.75 million. Tilefish are sold in restaurant in New York or bought by the Japanese to make *sashimi*. One tilefish operation consisted of three boats owned by two brothers. Each boat had two crews of three deckhands and a captain. They would fish the deep-water valleys off of New Jersey for ten days, return, and rotate out with another crew.

E4. The Infrastructure and the Fleet

The docks are a couple of miles away from the town's main street. Around the docks are a number of associated industries such as restaurants, fish markets and marinas, with most of these businesses closed for the winter season. There are four marinas, three party boats and eight charter boats with posted telephone numbers at the chamber of commerce. Marinas who cater to the recreational sector include the Montauk Marine Basin, the Montauk Yacht Club, Uihlien's Marina and Boat Rental, and West Lake Fishing Lodge. Commercial vessels are located at two city docks opposite each other on the harbour. One is located near two fish markets and one next to the Coast Guard station.

Most of Montauk's fish are packed out at four commercial facilities: Inlet Seafood, a fishing cooperative; Gosman's Dock; Montauk Fish Dock; and Deep Water Seafood. Except for Inlet Seafood, which opens after Saint Patrick's Day for the spring-summer season, there is little local processing and sale of fish. Some fish does go to local restaurants during the summer.

The commercial catch is shipped to Fulton's Fish Market in New York City. Fish are generally shipped whole frozen. In the past, there have been problems with the legitimacy of the market. Although a precise number of boxes (of fish) were sent to Fulton, Fulton claimed to receive a lesser amount in many instances. One key respondent noted: "*those practices have changed since the Government take-over of the market.*" There are few marketing alternatives for fisherman, and Fulton's continues to be the primary destination.

Areas previously dominated by baiting shanties near the state docks are taken over by whale watching a charter boat operations. Bating long lines is now carried out on board by deckhands:

"Fifteen years ago there used to be bait shanties here, but now they are all gone. You can see the whale watching and charter boats all along the docks where the bait shanties used to be.... We used the bait to fish long lines. Now, we fish for squid and bait our hooks by hand on board. We fish deep water for squid and tilefish, because the other species such as flounder are played out...most of the inshore fish are gone"—Commercial Fisher

Even though Montauk ranks third in the overall number of ground fishing permits today, in 1991 it did not even register in the top 25 ports in number of permits. This is a reflection of the purchase of permits in the years after 1991 to insure access to the fishery. It also indicates how counting registered fishing permits is not a good indicator of the number of commercial vessels in a port, nor necessarily of catch effort.

As of 1995, there were forty reported commercial vessels in Montauk (Drumm 1995). However, the according to a Coast Guard office and field counts of vessels, the functional ground fishing fleet

consists of only 24 vessels, not 40 as reported by Drumm (1995). A 1996 NMFS permit file puts the number of commercial vessels counting Montauk as their port city at 76. This includes all types of commercial MGF permits. Of these, 46 count Montauk as their home city, 27 other New York cities and towns while three reside in other states, including New Jersey, Connecticut, and Florida. However, the total number of groundfish permits held is 132.

In February, a total of 18 of the commercial fleet of medium to large scale vessels ranging from 32 to 90 feet were counted at the dock in February, and another six reported out fishing. All commercial vessels observed were trawlers with the exception of two lobster vessels. Party boats, tuna head boats, and whale watching boats dominated the dry-dock area.

Fishing *effort* off Montauk and on commercial stock targeted by Montauk fishermen (*e.g.*, loligo) is increasing somewhat from migration of vessels from other ports since the closure of the Georges Bank. This has caused some concern and conflict between local fishers and these “outsiders” (key respondents—two commercial fisherman, and Drumm 1995). A key respondent reported that the large boats from the New England fishery now fishing out of Ocean City Maryland are directly competing with the Montauk fleet for whiting, squid and other species.

There has been a transition from commercial to charter boat/recreational fishing with the decline of local fishery stocks. Part of this conversion includes a shift of effort into tuna fishing, which is seen as a viable alternative as groundfish fishing became less lucrative in the Sound:

“I switched over to tuna because it is easier to make money. You can make a lot of money catching tuna, and you don’t have the same overhead as with groundfish. Also, if you take out guests on charter, they don’t have to catch a fish to be happy.”

— Former Captain of a groundfish fishing vessel

E5. Adaptations to Crisis

A major concern and source of potential conflict is the competition between the stabilised commercial fleet and an expanding recreational sector. The sportfishing industry on Long Island contributes about USD 1.1 billion to the economy, while commercial fishing contributes a yearly average USD 54 million in seafood for public consumption. There are an estimated 174 000 saltwater fishing households on Long Island, and within the three mile limit, recreational catches of fluke, bluefish and scup regularly exceed harvests by commercial fishermen (Fagin 1994). Recent state laws include a series of bills that ban trawling near Long Island inlets and some other prime fishing areas. The prime purpose of the law is not to conserve fish but “*to help marina operators, bait shop owners and others by making more fish available for sport fishermen*” (Fagin 1994:A51).

Commercial fishermen are also concerned over the level of pollution in near-shore waters. Algal blooms, including “red tide,” have wreaked havoc with bay waters and shellfish. In 1994, concerns centred on dioxin pollution and other pollutants, which were forcing fishermen offshore. A song written by Billy Joel (“The Downeaster Alexa”) describes how Montauk fishers have to travel farther and farther off shore to make a catch because of environmental problems (Swift 1994).

Avoiding pollution and abiding by near-shore restrictions means longer days at sea at greater distances offshore. Fishing farther offshore has increased risk for those who traditionally fished the Sound, and two local Baymen died at sea in 1993 while fishing far from shore. Traditional fishing cycles of 2–4 days were tied into “making market.” With days at sea increasing to 5 or more, including greater transit distance and costs to reach the grounds, it has made earning an income more unpredictable. A local

crewman explains: “*We have to fish with the cycles. When markets open up to buy fish—if we can’t do this it makes it difficult to make a living — your income becomes very erratic.*”

In response to such events and economic concerns over fishing families, the Montauk Emergency Fishermen’s Fund was initiated in 1993. The purpose of this fund is “to take care of fishermen and their immediate families who experience loss of life at sea, medical hardship, or severe economic hardship” (Fund president).

Communication with management was expressed as a lack of understanding of what fishers and fishing was all about. Interviews with local commercial fishermen indicated a frustration with the management process, and those fishers felt their concerns were ignored even when they did have a chance to speak:

“We hold our local meetings in a room above the firehouse. When the state reps come by to listen to us, they nod their heads a lot but nothing is ever done about our concerns. We don’t see the situation the same—there are more fish out there than they say.... Those public hearings are just a rubber stamp so they can go ahead and do whatever they want anyway.”

— Long-time (30-year) commercial fisher

E6. Conclusions

Given the isolation of Montauk, with few options other than marine resource utilisation, this community is highly dependent on sustaining its commercial fishing enterprise. As in other secondary ports in this study, the commercial groundfish fishing sector in Montauk does not appear to be expanding, nor does it appear to be reproducing itself through replacement of old vessels with new, increased processing capacity, or increasing social yield (the number of fishers who sustainably participate). Declines in all of these areas are being hastened by the growth of the recreational sector, increasing fishing costs, pollution impacts on stocks, and regulatory restrictions. Yet, the expansion of fishermen into new fisheries such as tilefish, and switching to tuna fishing and other strategies (*e.g.*, whale watching) has given the commercial fishing community more flexibility than in larger ports such as Gloucester.

F. Cape May, New Jersey and Ocean City, Maryland

Situated at the south-eastern tip of New Jersey, at the mouth of Delaware Bay, Cape May has long been a departure and arrival point for the well-travelled Cape May, NJ to Lewes, DE Ferry, a transportation link between the cities of the north and the Delmarva Peninsula. Among nearby cities to the south are Ocean City, Maryland’s premier tourist destination and a common destination for tourists from Washington, DC, and other nearby metropolitan areas. In both areas, tourism dominates the economic activity and the commercial fishing fleets are, on the one hand, appendages to the tourist sectors and, on the other, economic activities that have been marginalised by the tourist sector. Fishermen in both locations have experienced the encroaching effects of coastal gentrification and real estate development, although portions of the fleet in Cape May have situated themselves within the tourist trade in a way similar to Chatham fishermen, becoming tourist attractions themselves and providing fresh fish to local markets and restaurants.

In Ocean City, the commercial fleet ties up at a small sheltered harbour south of the boardwalk and other attractions of the tourist trade. As noted elsewhere in this report, the fleet seems more marginalised than the fleet in Cape May, a portion of which has been well integrated into the tourist industry. McCay, *et al.* (1993) said this about Ocean City, lending support to the notion that the fleet is becoming more marginalised over time: “Ocean City residents are begrudgingly tolerant of the commercial fishing industry. The commercial docks are located between a business and residential section. Residents are making sure the commercial businesses and boats stick to the letter of the [zoning] law. Also, landside access to the harbour area is limited in that there is only one street on which a tractor-trailer can drive. In the past gear was stored on property that was zoned residential but this practice has been eliminated. Some very expensive homes have been built close to the harbour area and these owners do not like the sight of the gear.”

Ocean City’s fleet is primarily a small- to medium-sized vessel fleet, operating as day vessels and fishing often in Maryland State waters for blue crab, particularly behind the barrier islands. Cape May’s fleet is larger and more diverse than Ocean City’s, fishing with draggers; lobster pots, gillnets, and black sea bass pots. In 1993, McCay, *et al.* (1993: 76) reported that squid was becoming the most important species in Cape May, that there were 33 local draggers and 57 transient vessels. The fleet supplies fish to a bustling seafood processing sector at four primary locations around the city, creating shore-side employment for over 200 individuals, some of whom are contracted for work from as far away as Philadelphia.

Observing transient vessels is not less common in Ocean City. Perhaps the most significant attribute of the Cape May and Ocean City ports is their status as ports for transient boats from the north and south. During our visits, we saw shrimp vessels from North Carolina, Mississippi, and Norfolk in these ports, alongside local vessels. The central locations of Cape May and Ocean City in terms of northern and southern fisheries, combined with an increase in transience among fishermen in general as crises develop in one fishery after another, is likely to increase the importance of these ports in the future.

G. Southern Range: Hampton Roads/Newport News, VA, and Wanchese, NC

At this, the southern range of the ground fishing fleet, fishermen who are native to the area have developed a multi-species, multi-gear, highly flexible fishing strategy that relies on state and federal waters and includes the commercial exploitation of several species. Unlike the fleet based in the Gulf of Maine, the winter season along North Carolina’s Outer Banks and the mouth of the Chesapeake are heavy sink net fishing seasons, when commercial fishers target weakfish, various basses, flounder, monkfish by catch, and dogfish. During this season, as well, fishermen from several ports in the north-east also land fish at the fish houses of Wanchese, North Carolina and the two Virginia ports of Hampton Roads and Newport News. During a visit in March 1996, we encountered three New Bedford-based fishermen off-loading monkfish and monkfish livers from a 40’ (12 metre) craft at one of the principal seafood dealers in Wanchese, and in Portland we listed while fishermen related stories of wintering off North Carolina’s coast, as much to escape the chilling Gulf of Maine winter as to catch and land fish.

In part because fishermen in this region depend nearly as much on fishing in state waters as fishing in federal waters, those we interviewed less disturbed by federal regulations than fishermen in. At the same time, Eastern Dare/Outer Banks fishermen were less concerned (although not entirely unconcerned) about water quality issues than those fishermen in the other four regions. They expressed some concern over the navigational difficulties surrounding Oregon Inlet, but were far less inclined to bring up the issues of hog waste, mining, or forestry than other fishermen we interviewed. Because of

problems with Oregon Inlet, many seafood dealers have moved their marketing and processing operations from Wanchese to the Newport News/Hampton Roads region, both expanding their seafood buying capabilities and creating more integrated linkages between the two landing centres.

Based on visits to the area and interviews primarily with seafood dealers, there are around 80 to 100 trawlers in the 60' to 100' (18 metres to 30 metres) range that land fish in the Hampton/Newport area, although not all of these are local vessels. These fish for flounder—locally known as “fluke”—in the wintertime and scallop in the summer. An important by-catch of the scallop fishery in this region is monkfish. Seafood dealers interviewed ranged from the belief that changing regulations would affect no fishermen to believing they would have negative impacts on around half of the fleet, with 25% moving into other fisheries and 25%, primarily the larger vessels, going out of business.

Local fishermen felt that New England fishermen had been infringing upon their fishing territories and water since before Amendment No. 5, and Amendment No. 5 have exacerbated this. Fishermen operating out of the mouth of the Chesapeake expressed deepest concerns, among all the fishing issues, over problems with the quota systems for flounder. Fishing “inside” or state waters for flounder has long been a central part of North Carolina and Virginia fishermen, and they have, historically, supplemented these catches with flounder caught in federal waters. Quotas for flounder has caused them to shift from flounder to mackerel and dogfish, as well as move into the squid fisheries that are more popular along the New Jersey shore.

Some fishermen we interviewed cited a decrease in wintertime fishing opportunities—related, in part, to recent decline in oyster stocks—saying that this has led to increases in summertime fisheries, particularly crabbing in inside waters. As fishermen come into the Pamlico and Currituck Sounds, they encounter crowding problems associated with the trap fisheries of North Carolina’s Albemarle-Pamlico Estuarine System. Similar difficulties face crabbers in the Chesapeake, which have historically defined and defended territories. Thus, moving into inland waters is only a partial solution for fishermen in this region.

Two factors influence the behaviours of fishermen in this region: that they switch between federal and state waters and hence depends on several gears and species through the year, and that they rely heavily on nets. The former predisposes fishermen in this region to object to some of the federal quota systems and to view competition from fishermen from other states as problematic; the latter makes them more sensitive to those regulations affecting nets, particularly Florida’s net ban (which has caused an increase in Florida net fishermen fishing in North Carolina waters or the federal waters near North Carolina), mandated modifications to nets because of turtles or by-catch issues, and mesh size.

Fishermen along the Outer Banks and from Wanchese are especially sensitive to the historical importance of their fisheries and related marine lifestyles, beginning with the shore-based whaling fisheries of the early colonial period and going through subsequent periods where fishing families provided life-saving services to hundreds of ships that make up the “Ghost Fleet” of the Outer Banks. Fishermen we interviewed here mentioned the importance of this history in terms of the memories of old fishermen. One claimed, for example, that there have been periods in local fishermen’s pasts that they had to migrate to Florida because of declines in local fish stocks, making the argument that regulations need to consider extreme fluctuations in fish stocks as part of the economic hazards of commercial fishing. This same fishermen noted the importance of life-time experience in fishing and of the difference between knowledge gained through direct experience and knowledge gained through scientific methods; the latter, of course, may suffer from sampling biases, while the former may suffer from other kinds of biases (economic, political, religious, etc.), yet combining the two could far better inform the regulatory community than sole reliance on one or the other.

The heavy dependence on Wanchese as a fishing community demands special attention in this section. Seven principal families of seafood dealers ring the seafood industrial park and serve as the central locations of the estimated 200 fishing families who live in Wanchese as well as anchor the southern marketing behaviours of fishermen from as far away as New Bedford, Massachusetts and Portland, Maine. The fleets that originate from here and the fishing activity focused by the seafood dealers and the ports, concentrate around the seafood industrial park and fleets of trawlers organised or encouraged by seafood dealers. The large, greater than 100' (30 metre) vessels, as is occurring elsewhere, have been less active recently, their captains and crews now fishing from smaller crafts.

These arrangements have been replicated in the Newport/Hampton area. As one leaves either Wanchese or migrates across the Chesapeake, to Virginia's Eastern Shore and the other parts of the Delmarva Peninsula, more independent, owner-operator fishing operations prevail, with some long-time loyalties between fishermen and fish dealers that hinge on the questions of slip space and access. In recent years, fishermen in this region have become increasingly concerned that real estate development will entice dealers to sell their space to developers less interested in commercial fishing than in providing marinas and condominiums for recreational boating traffic.

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The authors extend their special thanks go to Renee Gagne, Patrick Stanforth, Martha Brown and Marina Guedes for providing fieldwork support. Also to be thanked are David Bergeron, Sefatia Romeo, and Angela Sanfelippe of the Gloucester Fishermen's Wives Association, and Jim Kendall of the New Bedford Seafood Coalition. They would also like to thank Patricia Clay and Peter Fricke of the National Marine Fisheries Service, Woods Hole. Most importantly, thanks go to the numerous fishers, families and community leaders who participated in this research.

This project was under the direction of Dr. Roger Rasnake, Executive Administrator of the Aguirre International Bethesda Office. Thanks go to Craig Bagemihl, Project Manager, and Wanda I. Foster, Quality Control Specialist.

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